



European Perspective on Specific Types of Territories

Applied Research 2013/1/12

Draft Final Scientific Report | Version 23/03/2012



This report presents the draft final results of an Applied Research Project conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

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List of abbreviations

CBMR	Cross-Border Metropolitan Region
CSF	Common Strategic Framework
EAFRD	European Agricultural Fund for Rural Development
EEA	European Environment Agency
EFF	European maritime and Fisheries Fund
ERDF	European Regional Development Fund
ESF	European Social Fund
FUA	Functional Urban Area
GDP	Gross Domestic Product
GRP	Gross Regional Product
ICT	Information and Communication Technologie
IP	Inner peripheries
LAU	Local Area Unit
MUA	Morphological Urban Area
NUTS	Nomenclature Unifiée des Territoires Statistiques
OR/OMR	Outermost Regions
PCA	Poorly Connected Areas
PUSH	Potential Urban Strategic Horizon
SGI	Services of General Interest
SPA	Sparsely populated areas
TFEU	Treaty on the Functioning of the European Union
TPG	Transnational Project Group

1.Introduction

1.1 Policy context

Regions with specific territorial features have received increasing attention in recent years. Most significantly, article 174 of the Treaty on European Union (TFEU) reads as follows:

“In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion.

In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions.

Among the regions concerned, particular attention shall be paid to rural areas, areas affected by industrial transition, and regions which suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and island, cross-border and mountain regions.”

Additionally, Article 349 of the TFEU states that specific measures shall be adopted to take account of the structural social and economic situation of the Outermost Regions, which is compounded by “remoteness, insularity, small size, difficult topography, climate and economic dependence on a few products”. Consequently, the Council shall adopt specific measures for these regions.

Thus, in policy terms, regions with territorial specificities are currently approached as a subset of disadvantaged and least favoured regions, and thus their specificities are described as “handicaps”. They are primarily identified as part of efforts to reduce disparities between European regions. The significant number of sparsely populated, insular, border and mountainous regions whose economic and social performance levels are around or above European average values are therefore not targeted by this provision.

The Territorial Agenda adopts a similar approach, as it only deals with specific types of territories by referring to “areas with specific geographic challenges and needs (e.g. structurally weak parts of islands, coastal

zones and mountainous areas)” and otherwise considers coastal zones and mountainous areas from a natural risk management perspective.

The Green Paper on Territorial Cohesion, published by the European Commission in 2008, takes a different angle. The subtitle of the document, “Turning territorial diversity into strength”, suggests that geographic specificities could also represent a chance for the concerned regions and for Europe. The first examples of this diversity – “the frozen tundra in the Arctic Circle”, “the tropical rainforests of Guyane”, “the Alps” and “the Greek islands” – are sparsely populated, outermost, mountainous and insular areas, respectively. The Green Paper furthermore defines territorial cohesion as “a means of transforming diversity into an asset that contributes to sustainable development of the entire EU”. However, the section entitled “regions with specific geographical features” introduces mountainous, insular, sparsely populated, coastal and outermost regions as areas that “face particular development challenges”, even if their subsequent description emphasises their combined assets and handicaps and the coexistence of positive and negative development trends. The ambivalent understanding of Europe’s extensive and diverse geographic specificities, as an asset (trends and current situation) as well as a source of territorial development challenges, shapes the political context for the present study.

In the working paper “Territories with specific geographical features” published by DG REGIO in 2009, Philippe Monfort calculated performance indicators for mountain, island, sparsely populated, border and outermost regions. He concluded that while these regions are “by nature, [...] less accessible and on average services are more distant from their population”, “each category includes a wide variety of situations”. Therefore, “specific regional development programmes” for these categories of regions are likely to be “ineffective” (Monfort, 2009).

The European Commission’s legislative proposals for the EU Cohesion Policy 2014-2020 include an additional allocation for outermost and sparsely populated regions of 926 million Euros and the possibility of modulating co-financing rates from the Funds to a priority axis to take account of “areas with severe and permanent natural or demographic handicaps” defined as “island Member States eligible under the Cohesion Fund, and other islands except those on which the capital of a Member State is situated or which have a fixed link to the mainland”, “mountainous areas as defined by the national legislation of the Member State” and “sparsely (less than 50 inhabitants per square kilometre) and very sparsely (less than 8 inhabitants per square kilometre) populated

areas” (European Commission, 2012)¹. These provisions were identical for the 2007-2013 Structural Funds programming period.

Among the innovative measures for the 2014-2020 period, the renewed focus on Community-led Local Development is particularly relevant for GEOSPECS areas. Building on, for example, existing LEADER action groups and the URBAN pilot project, the Commission wishes to fund programmes for capacity building, local public private partnerships, networking and exchange of experience. The focus is on specific sub-regional territories that can be urban, rural, coastal, cross-border, mountainous but that must be implemented by the local community. Considering that geographic specificities are factors of territorial identity around which local and regional actors coalesce, they may play an important role in the further bottom-up process leading to the definition of Community-led Local Development projects.

1.2 Objectives of the project and principles for the analysis of GEOSPECS categories

The GEOSPECS approach of geographic specificities can feed into these types of discussions, as it focuses on identifying possible effects of geographic specificity on regional and local development processes.

Its objectives are:

- to develop a coherent perspective on territories with geographic specificities;
- to identify development opportunities in these parts of Europe;
- to assess the extent of socio-economic diversity within each category;
- to explore how one could facilitate the achievement of strategic targets of the European Union and of European countries by taking better account the diversity of development preconditions linked to geographic specificities;
- to identify the potential role of territorial cooperation and partnership and assess the need for targeted policies for

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http://ec.europa.eu/regional_policy/sources/docoffic/official/regulation/pdf/2014/proposals/regulation/general/general_proposal_en.pdf

GEOSPECS areas, focusing on the identification of the appropriate administrative level.

This analysis faces multiple challenges:

- First, all territorial development issues and processes are potentially relevant, insofar as they *may* be influenced by geographic specificity. The scope of enquiry is therefore *a priori* unlimited.

- Second, the identification of the “GEOSPECS areas” requires a conceptualisation of each category of geographic specificity. This conceptualisation needs to consider that each category has been constructed in order to organise the perception of territories and facilitate communication. None of the GEOSPECS categories are in other words “given”.

- Third, the extensive overlaps between the various types of geographic specificities and the fact that they can be found in European regions with contrasted development levels imply that a benchmarking of GEOSPECS areas against European target values and/or average performances is not meaningful.

- Fourth, the focus on development opportunities leads to complex questions on why these have not already been realised. In other words, an “opportunity” is a situation where a critical factor prevents local and regional stakeholders from taking advantage of an identified resource or asset. Drawing on ESPON TeDi, GEOSPECS has sought to systematise the analysis of these situations by considering that unexploited opportunities result from a lack of local coherence between natural resources, human capital and the institutional context (see Figure 1).



Figure 1 The three dimensions to be put into coherence for the exploitation of territorial development opportunities

To overcome these challenges, the TPG has specified principles and characteristics for defining each category in order to identify delineation principles, as specified in Table 1 and 0. On the basis of the conceptualisation of each category, it is then possible to formulate

Table 1 Principles used to delimit GEOSPECS areas

<i>Nature of extension for GEOSPECS areas</i>	Outermost	Islands	Mountains	Sparsely populated	Border areas	Coastal zones
	◀◊▶	○	↔↔↔	↔	◊ ← I →	(◊) ← I →
	Designated politically as a part of Europe situated in a non-European geographic context	Defined as territories surrounded by bodies of water, irrespective of context	Defined on the basis of topographic contrasts with immediate neighbourhood	Defined on the basis of local population potentials, irrespective of wider geographic context	Defined on the basis of distance to a politically defined borderline	Defined on the basis of proximity to a maritime space, which in some respects is politically delimited

Inner peripheries
Not a geographic specificity.
Defined on the basis of a diversity of historical processes, leading a centrally located territory to be disconnected from physical, social and economic networks and experience relative or absolute decline.

Legend for symbols:		
◊ = Politically designated	I = Line	→ = Delimitation of GEOSPECS areas
○ = Unequivocally delineated	→ / → = Contextual parameters used for the delineation at local scale (LAU2 or daily mobility area) scale or considering a wider regional context	

Table 2 Conceptual & methodological interpretation of GEOSPECS areas

<i>Category of GEOSPECS area</i>	Outermost	Islands	Mountains	Sparsely populated	Border areas	Coastal zones
<i>Delineation principle</i>	Given		Based on threshold values		Based on distances to a line	
<i>Nature of specificity</i>	Defined politically, as a response to an inherited situation	Categories designated on the basis of specific physical characteristics		Categories designated on the basis of specific settlement patterns	Categories designated because they act as an interface and/or are situated on the rim of Member States	
<i>Data used for delineation</i>	Not applicable		Topography	Population potential	Time-distance, Euclidian distance, topological distance (e.g. contiguity)...	
<i>Most relevant territorial context</i>	Macro-regional context		Buffer zone with mutual influence	Macro-regional context	Buffer zone with mutual influence	

Inner peripheries
 Perception by local, regional and national actors
 Defined on the basis of a perception of being "out of the loop" in spite of a central location
 N/A
 Wider territorial context

hypotheses on their possible socio-economic effects so as to circumscribe the scope of enquiry. In other words, the enquiry focuses on identifying hypothetical causal connections between the different concepts of geographic specificity and socio-economic performance. Quantitative analyses guide this reflection, as they help to identify socio-economic patterns and trends that may constitute a challenge or, in contrast, a potential lever of growth and development. However, quantitative evidence can neither confirm nor invalidate the existence of a "disadvantage" or "advantage" in GEOSPECS areas, considered the high probability of spurious correlations when comparing geographically specific areas to the rest of Europe.

These considerations imply that it is not possible to use the NUTS3-based definitions of some GEOSPECS categories, as provided in the Fifth Cohesion Report and in the ESPON typology, for the present project. Also GEOSPECS does not aim to benchmark GEOSPECS areas against European average values. Rather, the project seeks to understand how each type of specificity may influence socio-economic development processes, and potentially lead local and regional stakeholders to formulate development objectives that are different from those prevailing at the European and national levels. For these purposes, delineations that, for example, neither distinguish highland areas from their respective piedmont, nor make it possible to consider phenomena such as double insularity, are not operational. Furthermore, delineations that deviate substantially from local and regional understandings of the different GEOSPECS categories may not function in a project that investigates how identities and geographic specificities interact. All delineations are therefore based on LAU2 units, as this is considered to be the scale at which delineations meeting the criteria described above may be met.

The TPG has nonetheless sought to maintain the greatest possible congruence between the LAU2 delineations and the ESPON typology. However, the focus on conditions for economic and social development has induced some significant differences in the approach.

First, GEOSPECS categories need to be separated in two groups:

- Mountain areas, islands, sparsely populated areas, Outermost Regions and inner peripheries are "areal notions", defined on the basis of the properties of parts of the European territory;
- Borders and coasts are linear notions. Associating areas to these "lines" requires hypotheses on the types of proximity that can be relevant from the point of view of socio-economic development.

These types of questions are not addressed in the ESPON typology, in which participation in cross-border cooperation programmes in the 2007-

2013 programming period is the defining feature for border regions. Coastal regions are defined on the basis of the proportion of the NUTS 3 population living in municipalities within 10 km from the coast; a justification of this distance threshold has not been provided.

The delineations of the “areal notions” of geographic specificity have been based on the following principles:

Mountains: The delineation builds on previous studies (Nordregio, 2004 and EEA, 2010). It is based on the GTOPO30 Digital Elevation Model, which records the average elevation of the Earth’s land surface in a 1km² grid. To define mountainousness, different thresholds of terrain roughness and slope were applied at different levels of altitude, up to 2500m, above which all areas are considered as mountains. The starting point is therefore the same as for the ESPON typology.

However, this set of grid cells with mountainous topography was approximated to municipal boundaries by considering that LAU2 units with more than 50% mountainous terrain should be considered to be mountainous. Mountain exclaves of less than 100 km² were excluded in the mountain delineation, and non-mountainous enclaves of less than 200 km² surrounded by mountains were included. The hypothesis is that mountainousness becomes socio-economically relevant when it is the predominant feature within the boundaries of a local community and extends over a certain area.

Islands: As a starting point, all territories that are physically disjoint from the European mainland and, because of their large population, the main islands of the British Isles (UK and Ireland) have been considered as insular, including parts of municipalities, but excluding inland islands. On this basis, a typology of islands was established. Firstly, islands with a fixed connection to the mainland are considered as a separate category. Secondly, a multilevel approach is used (NUTS 0 to LAU2), as the socio-economic impact and political significance of insularity is considered to be different depending on whether it occurs at the national, regional or local scale.

However, insularity cannot only be considered to be socio-economically relevant only when it concerns an entire region, as is the case in the ESPON typology.

Sparsely Populated Areas (SPA): The delineation of SPA is traditionally based on population density. The ESPON typology considers regions with less than 12.5 inhabitants per km² as sparse. This threshold value is drawn from paragraph 30(b) of the Guidelines on national regional aid for

the period 2007-2013, which defines low population density regions as “areas made up essentially of NUTS 2 geographic regions with a population density of less than 8 inhabitants per km², or NUTS 3 geographic regions with a population density of less than 12.5 inhabitants per km²”. However, this paragraph allows for some flexibility in the designation of these areas, as “NUTS III parts” with a population density of less than 12.5 inhabitants per km² may be added under certain conditions.

These complex “swapping rules” reflect the fact that delineations of SPA based on population density are imperfect. Capital cities of regions with large uninhabited areas may be defined as sparse, while rural areas with few settlements may not qualify. From the perspective of the TPG, the critical parameter is the number of persons that can be reached within daily commuting distance, i.e. within a distance of 50 km or 45 minutes travel time. The threshold of 100,000 persons has been used, as it corresponds to a population density close to 12.5 inhabitants per km² within a radius of 50 km from a point. In a second step, localities (LAU2 level) have been defined as sparsely populated if 90% of their area is covered by SPA as defined above. Lastly, the TPG considers a NUTS 3 region as sparsely populated if the region contains at least one sparsely populated locality.

Outermost Regions (OR): As OR are defined on an institutional basis, their delineation is given.

However, the GEOSPECS TPG considers that the way of analysing and depicting ORs does not provide an appropriate basis for the analysis of their development challenges and potentials. Firstly, in ESPON maps, OR are depicted as European isolates, without a geographic context. Consequently, it is not possible to analyse how they relate to neighbouring territories, e.g. in terms of flows, differences in development levels and wider economic production systems. Secondly, the scale currently used means that it is not possible to observe their internal territorial structures. GEOSPECS proposes new ways of presenting ORs.

For “border areas” and “coastal zones”, the TPG does not consider it meaningful to produce a general delineation, insofar as the ranges of mobility and interaction associated with the different types of coastal and border effects are different. However, the 45-minute travel distance plays a key role, as a proxy for the maximum generally accepted commuting and daily mobility distance.

Within border areas, *Cross-Border Metropolitan Regions (CBMR)* have been identified. These are “metropolitan regions” (i.e. which include one or more urban centres which are part of globalised economic networks

and exert an influence over their regional or national area) and have a significant cross-border dimension (i.e. each "side" of the border contains no less than 10% of the population of the CBMR).

The analysis of *Inner Peripheries (IP)* concluded that this category should not be considered as a geographic specificity. The literature review and exchanges with local and regional stakeholders showed that the defining feature of this category is demographic and economic decline. The term 'peripherality' does not primarily refer to being in the outer margins of any given territory. It is more often used to describe territories that are considered to be "out of the loop" and whose socio-economic performance is below average in a region. Inner peripheries can consequently not be delineated on the basis of quantitative criteria.

1.3 Project organisation

The construction of a coherent European perspective regarding Europe's specific types of territories presupposes that these two types of approaches are more explicitly connected and integrated. However, it also requires that the significance of each category of "geographical specificity" in a territorial cohesion perspective is understood and defined. In this regard, GEOSPECS adopts a wide and exploratory approach, incorporating a wide range of geographic specificities and covering numerous territorial development issues such as demographic and economic polarisation, accessibility and transport infrastructure, energy provision, connectivity, territorial cooperation and partnerships.

Figure 2 synthesises the three analytical dimensions of the GEOSPECS project:

- First, coherent delineations of different categories of geographic specificities, based on a common spatial reference framework. Numerous areas are characterised by multiple geographic specificities. Inner peripheries are in a specific position, as the TPG found that they should not be considered as a geographic specificity and could not be delineated on the basis of quantitative criteria. Quantitative analyses were primarily carried out as part of the first dimension. Second, analyses of a selection of transversal themes help to identify cross-cutting issues for geographically specific areas. These transversal themes are subdivided in three categories: economic development conditions, social processes, and natural resources and risks. They were primarily based on qualitative

analyses. However, some quantitative evidence was also produced in this context.

- Third, the unique regional combinations of geographic specificities create systems of challenges and opportunities. These combinations can be formalised as “nexus models”. When possible, the TPG has also sought to develop synthetic nexus models for individual GEOSPECS categories, or subgroups within categories.

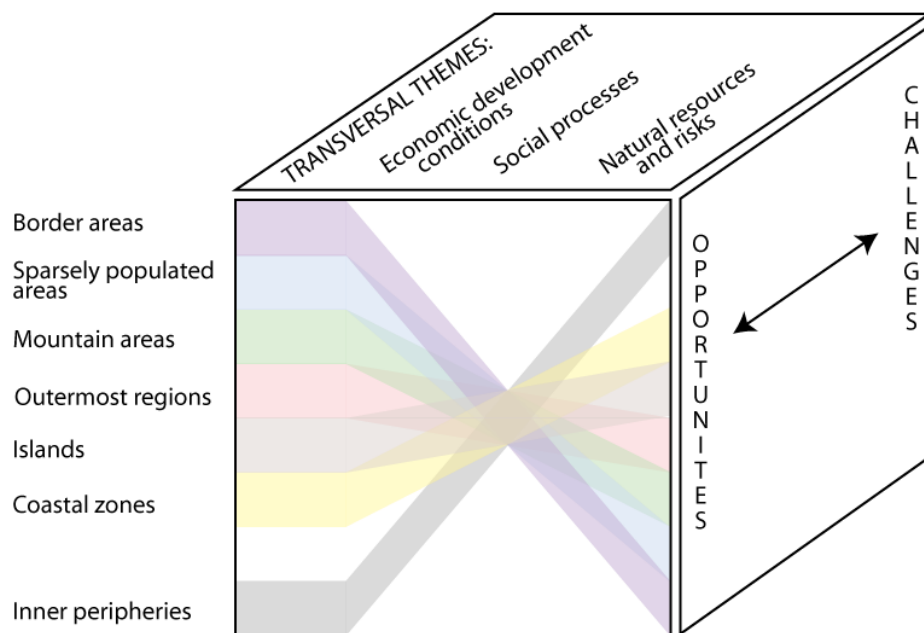


Figure 2 Analytical dimensions of the GEOSPECS project

To guide the work on these three dimensions, an analytical matrix was produced in which research questions and hypotheses were proposed for each geographic specificity within each transversal theme (see Annex 1). The production of this matrix was coordinated by the Centre for Mountain Studies, Perth College, University of the Highlands and Islands.

The conceptualisation of each GEOSPECS category was conducted by the TPG member in charge of that specificity, as specified in Table 3. The delineations were made by Alterra on the basis of these conceptualisation in cooperation with the University of Geneva. Quantitative analyses of each GEOSPECS category were carried out by the responsible on the basis of maps partly produced by the University of Geneva. Cross-analyses of delineations were produced by the University of Geneva.

Table 3 Division of responsibilities for GEOSPECS categories within the TPG

GEOSPECS category	Responsible partner
Mountain areas	Centre for Mountain Studies, Perth College, University of the Highlands and Islands, UK
Islands	E-Cubed Consultants, Malta
Sparsely populated areas	Nordregio, Sweden
Outermost regions	Louis Lengrand et associés, France
Border areas	Eureconsult, Luxembourg CEPS/INSTEAD, Luxembourg Leibniz Institute of Ecological and Regional Development, Germany
Coastal zones	Coastal & Marine Resources Centre, Environmental Research Institute, University College Cork, Ireland
Inner periphery	Alterra, Wageningen University & Research Centre the Netherlands

The compilation of LAU2 data was one of the main challenges of the project. This task was coordinated the University of Geneva (see section 2.2). Alterra produced all GIS calculations based on time-distance, including population potentials and access to services of general interest (e.g. airports). Alterra also produced land cover data for LAU2 units on the basis of grid data, and complemented 2006 population figures from Eurogeographics for the UK, Portugal, Lithuania, European Union candidate countries and potential candidate countries. The University of Geneva compiled European LAU2 figures from existing sources (e.g. 2001 national census figures compiled by GISCO, figures from the Nordregio 2004 Mountain Study complemented for non-mountainous countries for the ESPON 2006 programme). Additionally, LAU2 employment figures by NACE category were compiled from national sources with support from the TPG members.

Consultations with stakeholders and work on case studies were coordinated by the Centre for Mountain Studies. Perth College, , University of the Highlands and Islands with support from the University of Geneva. The case studies were produced by the TPG members on the basis of templates distributed by the Centre for Mountain Studies. In this template, elements of the analytical matrix that were considered most relevant for each case study were selected. For each case study area, a nexus diagram was produced. When possible, evidence from the case studies, the quantitative analysis, and the delineation of each category was synthesised in one or multiple nexus diagrams for each GEOSPECS category.

Table 4 Division of responsibilities for transversal themes within the TPG

Transversal theme	Responsible partner
Economic vulnerability / robustness facing globalisation	Nordregio, Sweden
Accessibility, connectivity, services of general interest	Alterra, Wageningen University & Research Centre the Netherlands
Role of Information and Communication Technologies	Louis Lengrand et associés, France
Residential attractiveness - Selective attractiveness	E-Cubed Consultants, Malta
Regional identity and cultural heritage as factors of development / Demographic dynamics	University of Geneva, CH
Protected areas and biodiversity as factors of development	Centre for Mountain Studies, Perth College, University of the Highlands and Islands, UK
Natural resource exploitation	Coastal & Marine Resources Centre, Environmental Research Institute, University College Cork, Ireland
Ecological vulnerability / climate change	Umweltbundesamt Österreich, Austria

The analysis of transversal themes was carried out by the TPG members specified in Table 4. The project partner produced guidance notes on transversal themes to help partners relate to them in each case study. Evidence from case studies was then compiled. However, the transversal themes are also based on literature reviews and more theoretical considerations on the different ways in which GEOSPECS areas may be considered to face specific opportunities and challenges within each theme.

2. Introduction

2.1 A spatial reference framework for the analysis of GEOSPECS categories

Given the need to approach GEOSPECS categories from the point of local communities and their preconditions for growth and balanced development, GEOSPECS needed to use the LAU2 level as a starting point for its analyses. It is the first ESPON project to base all its analyses on data and delineations at the LAU2 level.

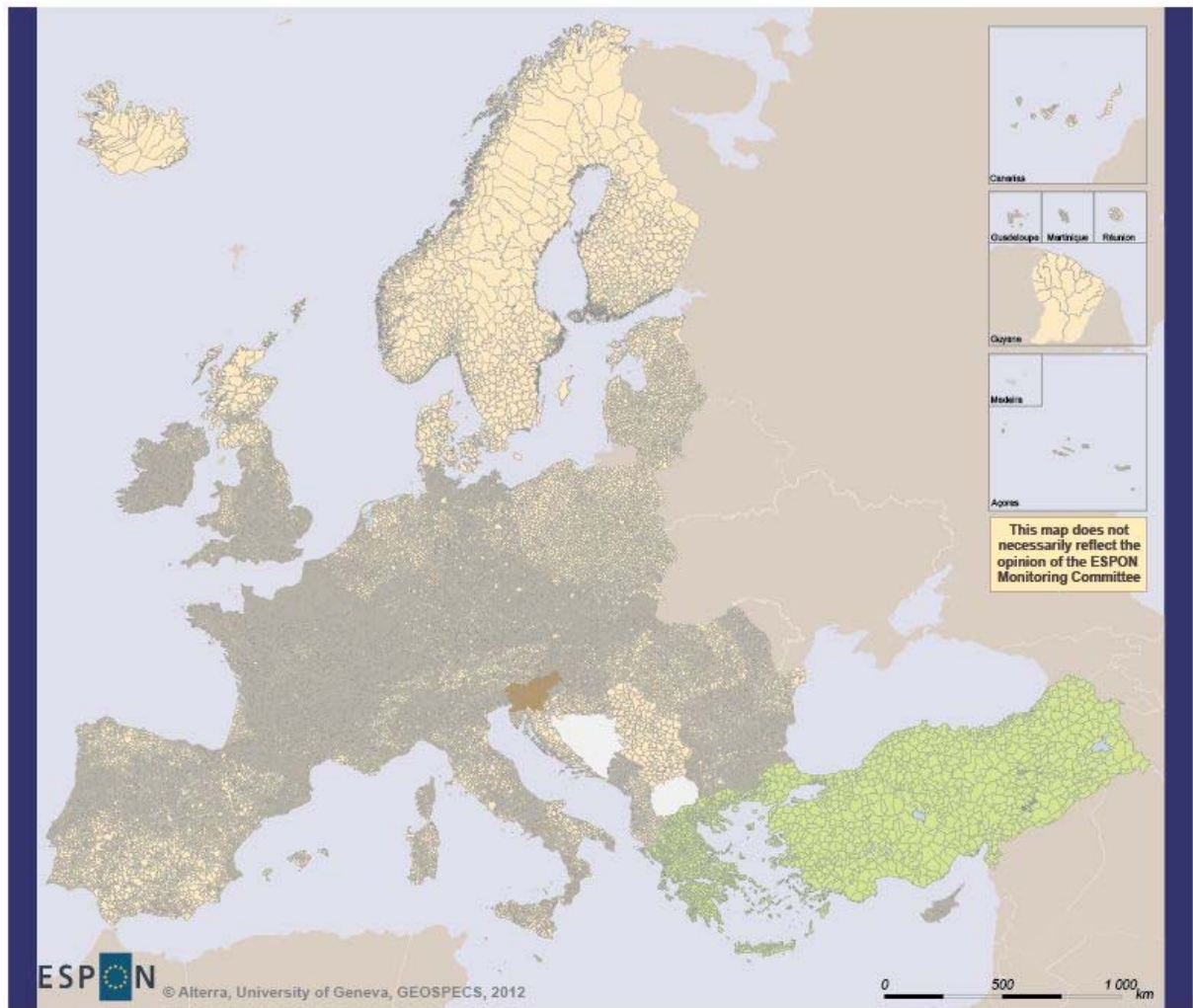
Therefore, ESPON map templates, tools for data compilation and data supply and available mapping files had to be revised to fit the project's needs.

The analyses were based on the Eurogeographic EuroBoundaryMap v4.0 delineation of European Local Area Units (LAU) in 2008². This map included LAU2 units for all countries except Greece (LAU1) and Slovenia (Settlement, below LAU2). Furthermore, this map did not cover countries of the Western Balkans and Turkey. Digital boundary maps of LAU2 units for Croatia, Albania and Montenegro were collected from national sources by the University of Geneva; a corresponding map of LAU1 units for Turkey was collected by Nordregio. In addition, the Eurogeographic EuroBoundaryMap v5.0, made available in February 2011, contained delineations of LAU2 units in Serbia. All additional boundary maps were adapted so that the external borders of each country would fit seamlessly³ and so that their coastlines would fit with the Eurogeographic world coastline.

The level of detail of this map was important, as the GEOSPECS TPG would overlay it with grid layers with calculations of distances to borders and coasts; with road network models to distinguish between islands with and without fixed links; and with other types of geographic information. As illustrated by Figure 3, the GEOSPECS map has a considerably higher spatial resolution than the regional delineation maps used in the ESPON map kit, making overlays with other types of data possible.

² Except for municipal borders within Serbia, which were based on the Eurogeographic EuroBoundaryMap v5.0.





³ A limited number of LAU2 units of the Western Balkans could not be adapted to fit seamlessly.




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Regional level: LAU2 (except Turkey LAU1)
 Source: GEOSPECS, 2011
 © EuroGeographics Association for administrative boundaries
 except Western Balkans and Turkey (national sources)

Administrative subdivisions

-  LAU2 boundaries (2008)
-  LAU1 boundaries (2008)
-  Settlement (subdivision of LAU2 boundaries) (2008)
-  Countries for which the ESPON GEOSPECS project could compile neither LAU2 nor LAU1 boundaries

 Non-ESPON space

Map 1 Boundaries of LAU units compiled for the GEOSPECS project

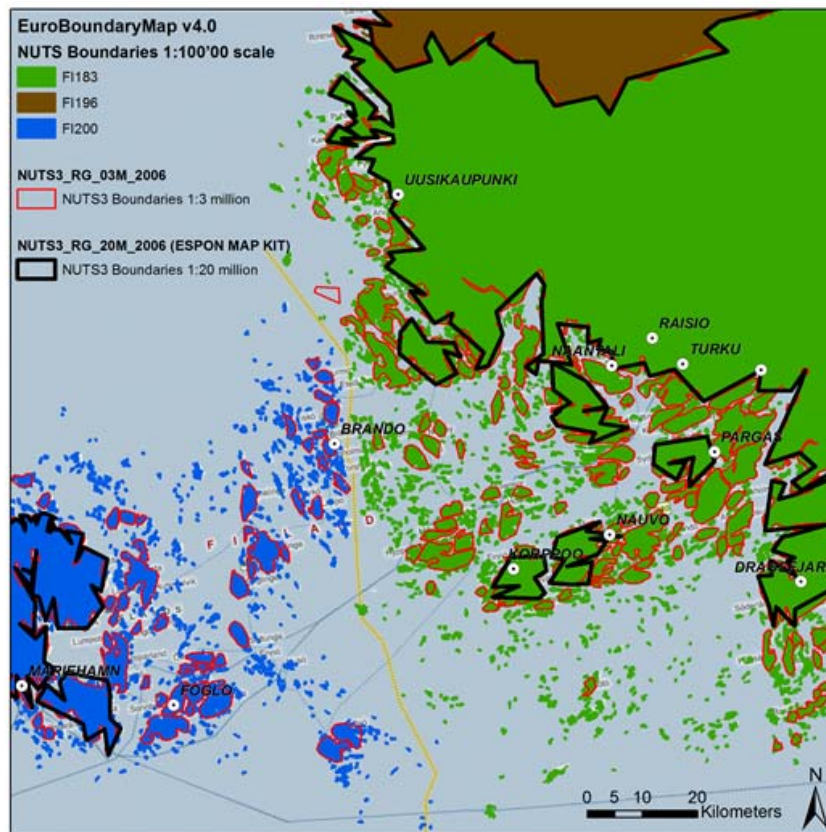


Figure 3 Comparison of the ESPON map kit and EuroBoundaryMap maps

Only two countries of the ESPON space could not be covered: Bosnia and Herzegovina and the Former Yugoslav Republic of Macedonia. The remaining 36 countries (including Kosovo) are subdivided into 125,049 administrative units. The delineation of all GEOSPECS categories and the subsequent quantitative analyses were entirely based on this subdivision in LAU units. For simplicity, these are referred to as LAU2 units in the report, as the administrative subdivisions correspond to this level for 33 out of 36 countries.

Additionally, the ESPON map kit did not allow for overlays of administrative boundaries of Outermost Regions with other types of geographic information, because the boundaries had been moved so as to appear “above Russia” in the map template. For GEOSPECS, this had to be corrected: in the alternative map template, each Outermost Region is mapped in a separate map layer. The only effect on the final maps

Table 5 Delineation methods and related material

	Material	Essential methodological assets
Topography	Coastline	Two complementary models of coastline must be coupled to cover the GEOSPECS space. The EEA CLC2006 coastline offers detailed descriptions of the environment and type of coastal areas. Related material includes "Eurosion DB" on coastal erosion trends and factors. It covers most of the GEOSPECS space except for the Outermost Regions, Iceland, Norway, Montenegro and Turkey. For these countries, the coastline will be completed by the worldwide Eurogeographic COAS2006 .
	Elevation model	Based on GTOPO30, the EEA model is composed of 1*1 km cells with attributes such as: altitude, slope and relative scores according to neighbouring cells. The definition of mountain areas is based on a combination of those attributes, together with thresholds.
Time-distance	Road network	The Eurogeographic road network is fundamental for GEOSPECS. The Western Balkans, Bulgaria and Turkey are added from OpenStreetMap.
	Reference grid and friction surface	Measures of time-distance are based on the "friction surface" of cells (grids from 250*250m to 5*5km). Friction is defined by the average travel time required to cross a cell in all directions, taking into account road and off-road travel speeds. Time-distance and the resulting "isochrone areas" covering the entire GEOSPECS space are used for the characterisation of diverse territorial categories. On one hand, they help the TPG to explore the socio-economic significance of proximity to borders and coasts. On the other, they are one component in the delineation of inner peripheries. They are also used in the calculation of topologic population potentials (cf. below)
Demography	Population potentials	The TPG has calculated two types of population potentials: Euclidian and Topologic. In order to calculate topologic population potentials, the TPG has overlain a population grid with the friction grid (both are 5*5km and developed by the TPG). The method consists of looping over all unique value cells and, for each cell, calculating the population potential by: <ul style="list-style-type: none"> • defining a reachable zone of cells by calculating the cost distance based on the friction grid and a travel time of 45 minutes • calculating the total population within the zone, by summarizing all population grid values • assigning the total population value to the base cell from the unique value grid Population potential is directly used for the definition of sparsely populated areas and inner peripheries.

produced is a marginal difference in the appearance and orientation of the Outermost Regions due to the application of correct projection systems for each of them⁴.

Maps of NUTS 3, NUTS 2 and NUTS 0 boundaries were constructed on the basis of this digital LAU2 map, in order to allow for overlays with data at these geographical scales and for multi-scalar GIS analyses (e.g. proportions of NUTS 3 regions with geographic specificities).

A number of other geographic datasets were used to delineate and characterise GEOSPECS categories, as described in Table 5. The coastline and digital elevation model are essential for the topographic characterisation of each territory, while road network models and settlement data are used to describe the demographic context, transport infrastructure, and relative positions of individual territories.

2.2 Analyses based on LAU2 data: the notion of potentials

The objective of the TPG was initially to use potentials to compare data from different sources and years, using different geometries. Because of technical difficulties with the processing the local data, only potentials of 2006 population could be produced within the framework of the project. The TPG has, however, demonstrated the feasibility of producing potentials based not only on Euclidian distance, but also network distance along the road network, for the entire ESPON space.

The general logic of potential is illustrated in Figure 4. The underlying idea is that individual municipalities should not be considered in isolation from each other when considering development opportunities and challenges. It is more relevant to consider areas of interaction around each point. In this respect, areas of daily mobility play a particularly important role. The threshold of 45 minutes has been chosen as a threshold for maximum generally accepted daily mobility. This threshold is based both on empirical and normative considerations. The TPG has not been able to identify Pan-European studies of commuting patterns. However, in its 2004 survey on living conditions of households, the Swedish Institute of Statistics observed that over 90% of the employed population had a place of abode situated at less than 45 minutes from their workplace. A

⁴ Canary islands and Madeira: WGS 1984, UTM Zone 28; North, Azores: WGS 1984, UTM Zone 25 North, French Guiana, Guadeloupe and Martinique: WGS 1984, UTM Zone 22 North; Réunion: WGS 1984, UTM Zone 40 South

corresponding study in 1967 found the same relationship. However, the study notes that travel-to-work distance varies between regions. In the Stockholm region, the proportion of people commuting 30 to 45 minutes each way is twice higher than in Sweden as a whole (20.2% against 9.8%). However, the proportion of people living within 45 minutes of their workplace was only seven points lower than the national average (84.2% against 91.2%). Similarly, according to the 2004 American Community Survey (ACS) sponsored by the National Association of Realtors and Smart Growth America, "a commute of less than 45 minutes is the most important factor in deciding where to live for 79 percent of Americans" (Anari, 2006)⁵. There is therefore empirical evidence that the 45-minute threshold is significant.

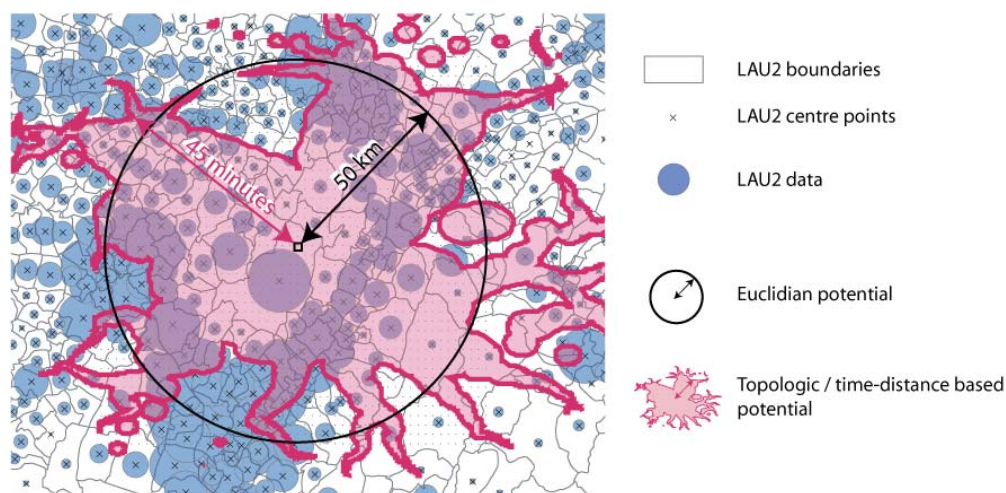


Figure 4 Calculation of potentials

Data associated with all LAU2 of which the centre point falls within the 50 km circle or area accessible within 45 minutes are summarised; this sum is the "potential". This means that the same data are taken into account as many times as they are associated to LAU2 units that are part of the potential functional neighbourhoods of the points of measurement. The GEOSPECS TPG has measured potentials for the centres of 5x5 km grid cells across Europe.

There are also normative arguments in favour of choosing a 45-minute threshold. In the Norwegian National Transport Plan, so-called "labour market, housing and service provision regions" are delineated on the basis of 45-minute travel times to a settlement of over 2,000 inhabitants. This is considered as the maximum travel time to preserve a good quality of life, which in turn is a necessary condition for "robust" regional development. Similarly, for the UK, in a study entitled "Health of People

⁵ Anari, Ali (2006) Need for Speed – Commute Time Influences Homebuyers, *Tierra Grande, Journal of the Real Estate Center at Texas A&M University*, Vol. 13, No. 3.

who Travel to Work: The Effect of Travel Time and Mode of Transport on Health”, Palmer (2005)⁶ analyses the results of the Kent and Medway Health and Lifestyle Survey, which focussed on the health of people commuting to London and those working elsewhere who were travelling for more than 45 minutes each way every day.

Admittedly, other thresholds could also be used as proxies for daily commuting. One main objective of GEOSPECS is to demonstrate the added method of this way of analysing local socio-economic data. As illustrated by the two previous paragraphs, the selection of thresholds can be based on both empirical consideration, i.e. on the range of observed mobility and interaction, and normative choices, i.e. what mobility ranges are considered desirable. These normative choices are not to be made by researchers, but should result from political choices.

A limitation of this type of approach is that mobility ranges vary according to gender, wealth, and social groups⁷. This needs to be taken into account when interpreting results on analyses based on potentials using a single travel time threshold.

The process of producing population potentials is relatively complex, as illustrated by Figure 5. For LAU2 units composed of multiple parts (e.g. coastal LAU2 with islands), it is first necessary to estimate the population in each of their components. These populations per part of LAU2 are then transferred to a grid. Time-distances are calculated on the basis of an “impedance grid”: the time needed to cross each grid cell is estimated on the basis on the roads going through it, land cover, topography (terrain roughness), rivers and railroads. The two latter parameters are interpreted as potential obstacles⁸.

The population potential for each LAU2 can then be calculated on the basis of the population potentials of grid cells within its boundaries. It is also possible to consider internal variations of population potential within LAU2 boundaries.

⁶ Palmer, Ann (2005) The Effect of Travel Time and Mode of Transport on Health – What have we learnt from the Kent and Medway Health and Lifestyle Survey?, University of Kent centre for health services studies. <http://www.kent.ac.uk/chss/researchcentre/docs/commuter.pdf>

⁷ Polk, Merritt (2004), Law, Robin (1999) Krantz, Lars-Gunnar (1997) Diaz Olvera et al. (2004), Orfeuil, (2006) Krakutovski and Armoogum (2007), Vågane (2000)

⁸ It is not possible to integrate travel times by rail in the model, as this would presuppose detailed information on railway connections. For each of these connections, one would need to consider whether the frequency and cost justify that they should be taken into account. In addition, railway connections are subject to frequent changes.

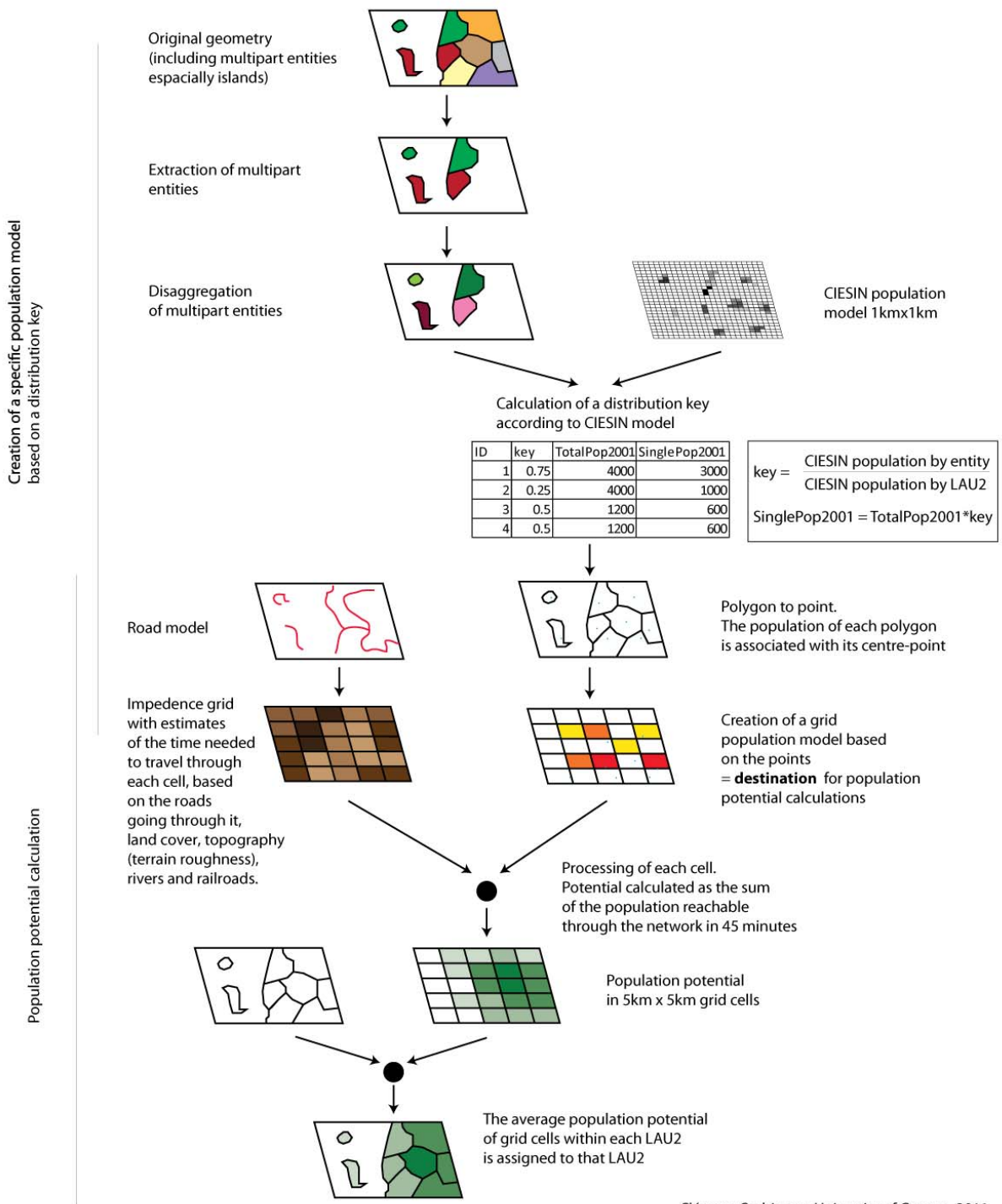


Figure 5 Method for the calculation of potentials

2.3 Delineation of urban areas

As illustrated by Figure 6, urban areas and regional urban endowment can be approached from different perspectives:

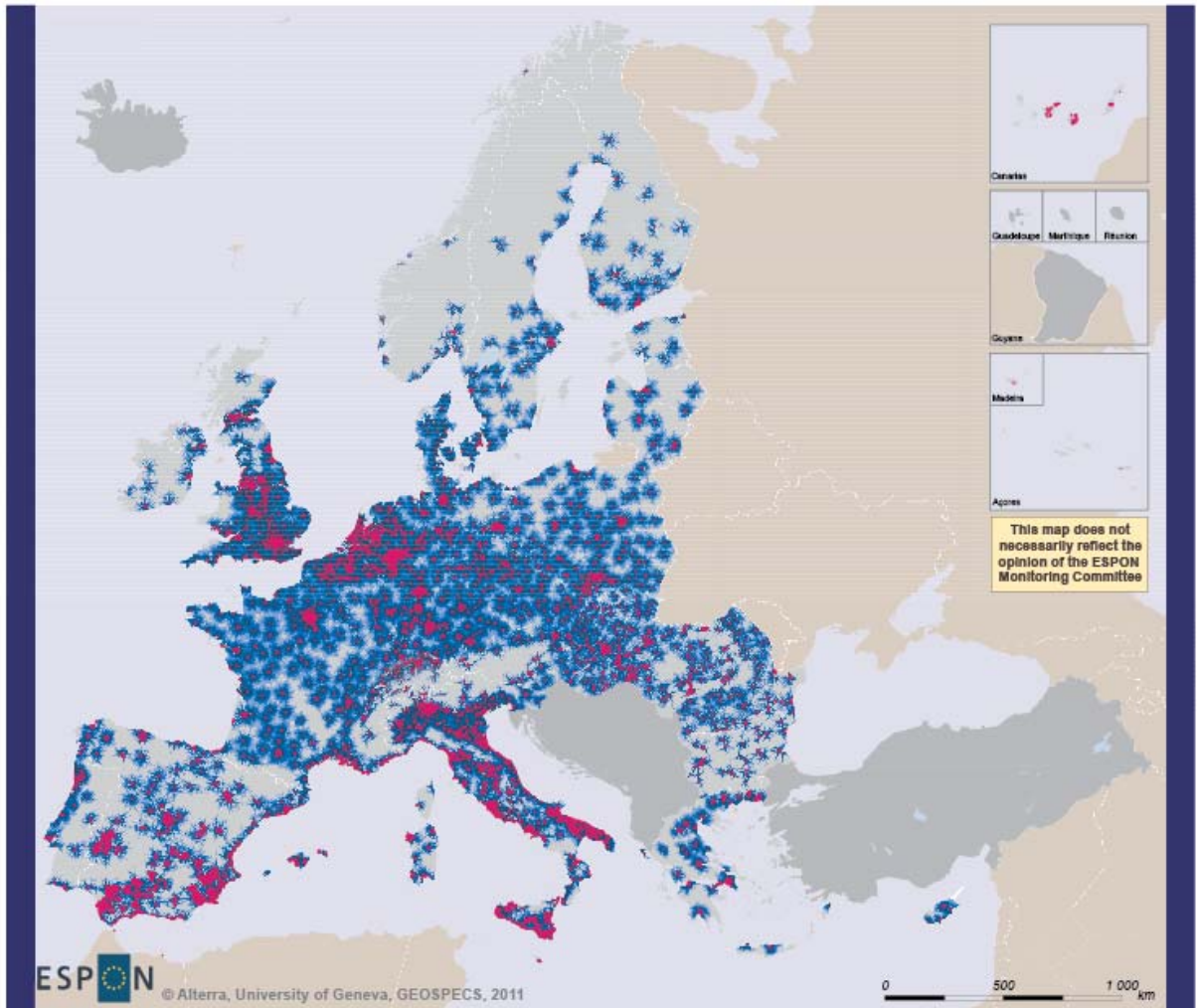
- From a settlement structure point of view, using morphological urban areas;
- From a functional point of view, using functional urban areas delineated on the basis of commuting-patterns;
- From an accessibility, by considering travel times to the nearest urban centre.

GEOSPECS combined these three approaches, considering the limits as morphological urban areas as a proxy for urban centres, whose relative importance was estimated on the basis of the population of the Functional Urban Areas around them, while considering that being within a travel distance to an urban centre was the most importance aspect when analysing development opportunities and challenges.

As specified in section 2.4, data on morphological urban areas (MUAs) and functional urban areas (FUAs) was provided by the ESPON Database project. These MUAs are delineated at the LAU2 level, and are considered as an acceptable proxy of urban centres in most of Europe. However, in northernmost Europe (Norway, Sweden, Finland and Denmark) another, more restrictive proxy for urban centres was used because of the particularly large size of LAU2 units: the largest continuous built-up areas within each MUA were identified on the basis of the EuroRegionalMap V30/31. Similar types of corrections could have been applied to other parts of Europe, e.g. southern Spain. This was not done because of time constrains. Delineations of areas within time-distance of urban centres have previously been carried out as part of the ESPON 1.1.1 project^{9,10}, using a threshold of 45 minute. These areas were designated as Potential Urban Strategic Horizons (PUSH). Contrary to ESPON 1.1.1, GEOSPECS considered distance from the edge of the urban centres (i.e. MUAs or built-up areas in Norway, Sweden, Finland and Denmark). This allowed GEOSPECS to take better account of the spatial extent of the largest urban centres. To reflect these improvements of the PUSH calculations from ESPON 1.1.1, the areas within 45 minutes travel time from urban core areas are designated as PUSH2-areas.

⁹ Nordregio et al. (2005) Final report of the ESPON 1.1.1 project « Potentials for polycentric developments in Europe », ESPON: Luxembourg.

¹⁰ ESPON 2013 Technical report: The functional urban areas database



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Regional level: LAU2 (except Turkey LAU1)
Sources: ESPON database (MUA boundaries),
Eurogeographics (built-up areas), GEOSPECS,
2011 (time-distance calculations)
© EuroGeographics Association for administrative boundaries
except Western Balkans and Turkey (national sources)

**Travel times to edge
of urban core areas**

- 0 to 10 minutes
- 10 to 15 minutes
- 15 to 20 minutes
- 20 to 30 minutes
- 30 to 45 minutes

Urban core areas
(MUAs, except
Norway, Sweden,
Finland and Denmark:
largest continuous
built-up areas
within MUAs)

- Lakes
- Cyprus - Acquis suspended
- Non-ESPON space
- No data
- ESPON Space

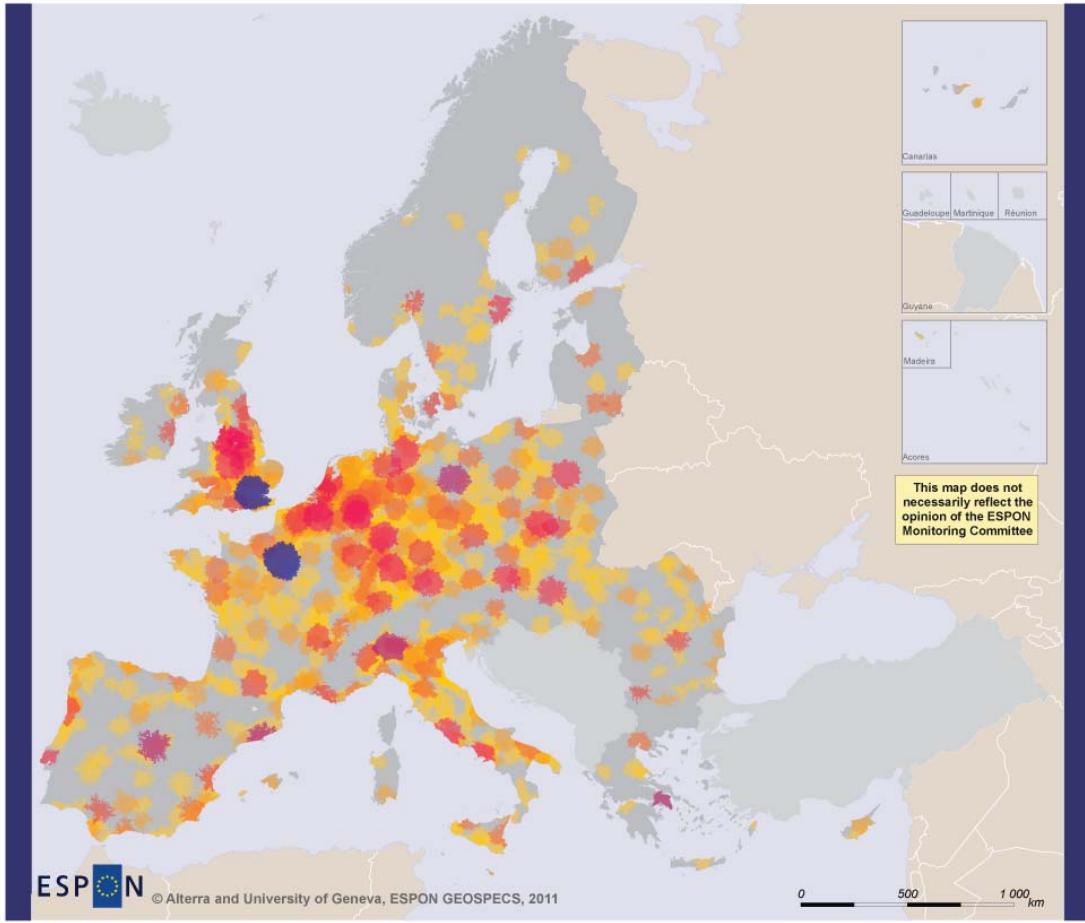
Map 2 Time distances to the nearest urban core area

The time distances to the nearest urban core area, calculated using the same impedance grid as for population potentials (see Figure 5) is represented in Map 1. Time distances were also calculated individually from each urban core area, so as to identify areas with access to urban areas of different sizes (as the travel time to the closest urban area can be a less relevant than that to a more distant and larger city). Additionally, as previously argued by ESPON 1.1.1, simultaneous access to multiple urban centres creates situations of potential polycentric development, from which individual localities can draw additional advantages, e.g. in terms of access to services and diversity of employment opportunities.

The overlay of areas within 45 minutes travel time of urban centres of different importance is presented in Map 3. The relative importance of urban core areas is assessed on the basis of the total population of its Functional Urban Area, calculated by the ESPON Database project.

Comparing the maps of MUAs, FUAs and PUSH2 areas in a specific territory (e.g. Cyprus, Figure 6), one observes the different perspective induced by each type of representation of the urban. The MUAs only cover a small proportion of the national territory. The FUAs are mutually exclusive. The limited extent of the Larnaca FUA is for example due to the fact that most important commuting flows are in direction of Nicosia. By contrast neighbouring PUSH2 areas overlap, reflecting the possibility of commuting to multiple locations.

As a last step, for analytical purposes, PUSH2 areas were approximated to LAU2 boundaries. LAU2 units of which more than 30% of the area was covered by a PUSH2 areas were considered to belong to that PUSH2. The groups LAU2 belonging to PUSH2 areas of which the urban core was associated with FUAs of more than 100 000 and 750 000 inhabitants constituted to delineations of "urban areas" that were integrated in the cross-analysis of geographic specificities. These thresholds were chosen because they make it possible to cover to major national and regional capital cities, respectively.



ESPON © Alterra and University of Geneva, ESPON GEOSPECS, 2011

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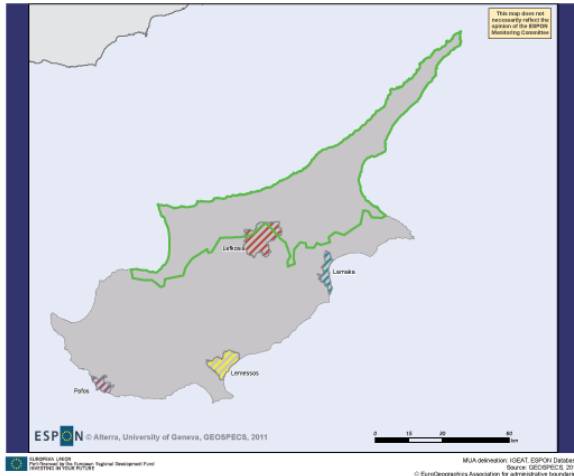
PUSH2 areas (FUA population > 100 000 inhabitants)
 Areas within 45 minutes travel time from each urban core area, classified on the basis of the population of the Functional Urban Area that is associated with it.

- 100 190 - 250 000
- 250 001 - 500 000
- 500 001 - 750 000
- 750 001 - 1 000 000
- 1 000 001 - 3 000 000
- 3 000 001 - 6 000 000
- 6 000 001 - 12 972 492

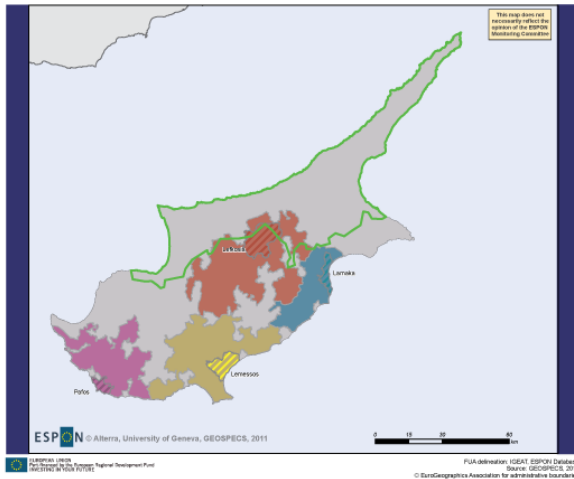
- Non-ESPON space
- No data
- ESPON Space beyond commuting distance

Map 3 PUSH2 areas around urban core areas associated with a FUA of more than 100 000 inhabitants

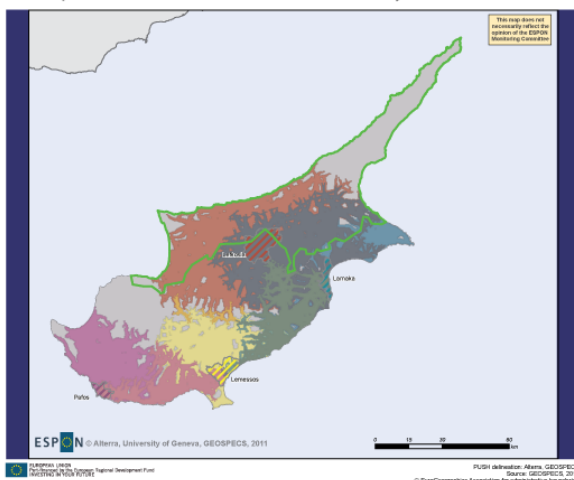
Morphological Urban Areas (MUAs)
Municipalities with continuous built-up areas




Functional Urban Areas (FUAs)
Municipalities with over 10% in-commuting to MUA





Potential Urban Strategic Horizon (PUSH areas)
Municipalities within 45 minutes from MUA by road



 Morphological Urban Areas (MUA)

 Functional Urban Areas (FUA) - mutually exclusive

 Potential Urban Strategic Horizons (PUSH) - overlapping

 Areas that are not under the control of the government - acquis suspended

MUAs in this part of Cyprus not taken into account (missing data)

Figure 6 Different approaches of urban areas and urban endowment: MUA, FUA and PUSH

2.4 Analytical matrix

The GEOSPECS project analyses seven categories of geographic specificity and eight transversal themes (see 1.3). The analytical matrix crosses these two dimensions. It is a product of the conceptualisation of each category of geographic specificity and of reflections on each transversal theme, and functions as a framework for quantitative analyses and case studies (see annex 1).

It also provides an overview of the ways in which each transversal theme are dealt with across the different geographic specificities, in view of producing a stronger narrative on geographical specificities across the whole ESPON space.

The analytical matrix contains both general questions concerning each transversal theme and geographic specificity and more detailed research hypotheses. While these questions and hypotheses have guided the analyses, it has not been possible to address all of them in detail. As such, the analytical matrix is a more general programme for research and investigation on categories of geographic specificity, going beyond the scope of the project.

2.5 Compilation of data

This section presents the datasets gathered as part of the GEOSPECS project, and information on the ways in which these data were processed.

One goal of the project has been to collect local data (at LAU2-level, whenever possible) covering the entire ESPON space¹¹ in order to describe GEOSPECS categories and their subdivisions (e.g. mountain massifs, island, coastal areas) by aggregating local data. Considering the scope of the task (125,049 entities), the TPG focused on a group of basic indicators, so-called “core indicators”. These cover all basic territorial dimensions, including demography, economic activities, environment and accessibility. Additional datasets have complemented these core indicators, such as NUTS0 data used to compute discontinuities along national border and data covering themes of particular relevance for Outermost Regions.

¹¹ excluding the western Balkans

Total population 2001 and 2006

Population data for 2001 are drawn from a GISCO dataset combining national census data from 2001 with an adapted boundary map. This dataset covers the 27 EU countries, EFTA and Croatia. The geometry of this map differs from the EuroBoundaryMap 2008, which has been used for all delineations and calculations in GEOSPECS. The transfer of the data from one geometry to the other was based on automated overlay procedures, with manual corrections along the coastline.

Population data for 2006 is primarily based on population data in the attribute table of the Eurogeographics EuroBoundaryMap 2006. This file provides population data for all of the ESPON space except Latvia, Portugal, the United Kingdom, the Western Balkans and Turkey. For these countries, the populations of municipalities have been calculated using the CIESIN¹² 2005 1km² population model and the grid data were then aggregated into EuroBoundaryMap 2008 geometry.

The differences between these two data sets imply that the data should not be used to compare demographic trends in individual LAU2, but that they provide a reasonably accurate basis for analyses at the level of groups of LAU2 (e.g. mountain massifs, islands, coastal areas).

The same consolidated data set for population in 2006 has served as basis for the calculation of population potential in 2006 (see Section 2.2 of the scientific report).

Population by age structure

Data on LAU2 population by age groups are drawn from the database compiled for the study "Analysis of mountain areas in EU Member States, acceding and other European countries"¹³. The reference year is 2001.

However, for some countries, data were missing or considered to be of insufficient quality. In these cases, data was collected from national sources: Switzerland (2000), Germany (2008), Iceland (2001), Italy (2001) and Spain (2008).

¹² <http://sedac.ciesin.columbia.edu/gpw>

¹³ NORDREGIO (2004). Analysis of mountain areas in EU Member States, acceding and other European countries. Report prepared for the European Commission. Stockholm, Nordregio

Employment by sector of activity

Local data on employment by economic sector have been gathered directly from national sources with support from the ESPON contact points (ECPs) in some cases. The datasets that were compiled were rather heterogeneous, as different methods of counting the number of gainfully employed persons are used in ESPON countries. Some countries register employees at their place of work, while others use the place of residence. The years for which data were available varied significantly. Older datasets use the NACE Rev 1.1 classification, while newer ones applied the Rev. 2 version. Some count the total number of work places, while others convert figures into full time equivalents. The challenge was therefore to develop a method to produce a consistent European database based on these different national datasets.

As a first step, datasets using the Rev. 2 classification were converted into the Rev. 1.1 classification. This older classification was used for the European dataset because conversion to the Rev. 2 classification is not possible.

The second step consisted of adjusting data from various years and counting employment in different ways. This was done by calculating a ratio between GEOSPECS scores and Eurostat 2008 NACE data at NUTS0 level. National data on local employment structures were, in other words, used as a key to distribute European national employment figures of 2008 at the LAU2 level.

As a result, comparable data on local employment structures have been produced. However, there are some biases in the data due to the fact that local data correspond to different years.

Land cover

Data on land cover define the areas of, and boundaries between, ecosystems such as artificial surfaces, forests, grasslands and cultivated systems.

Two sets of data on land cover have been combined to produce analyses covering the entire ESPON space, as Greece and the Outermost Regions are not covered by Corine Land Cover 2006¹⁴. For these regions, they were replaced by ESA GlobCover 2009 V2.3¹⁵. As categories differ between the databases, they have been simplified so as to construct aggregate classifications that are comparable.

¹⁴ <http://www.eea.europa.eu/data-and-maps/data/corine-land-cover-2006-raster-1>

¹⁵ <http://ionia1.esrin.esa.int/>

Protected areas

Datasets on protected areas have been constructed by combining two complementary databases:

- The European inventory of nationally designated areas (CDDA¹⁶) provides information on protected sites and the national legislative instruments which directly or indirectly create protected areas.
- Natura 2000¹⁷: an EU-wide network of nature protection areas established under the 1979 Birds Directive and the 1992 [Habitats Directive](#). The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats.

Most correction on original datasets was technical, undertaken to get a consistent dataset (without counting doubles etc.). Regions not included in the public EEA data and French Outermost Regions have been complemented with published CDDA data and/or available national datasets.

Sunshine duration

Data on sunshine duration were compiled from the World Radiation Data Centre¹⁸, European Climate Assessment & Dataset¹⁹ and the Swiss and Norwegian Meteorological Institutes.

The GEOSPECS data on sunshine duration are the results of an interpolation of 600 measurement points gathered from these four data sources, with monthly sunshine durations between 1961 and 2001. Based on inverse distance weighted (IDW) interpolation with a distance coefficient $P=3$, estimates were calculated for all the ESPON space, providing a coherent global European coverage. However, local comparisons should be carried out with caution, taking into account the positions of the measurement points. For a better interoperability with other GEOSPECS data, the interpolation is calculated for 5*5km grid cells.

¹⁶ <http://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-5>

¹⁷ http://ec.europa.eu/environment/nature/natura2000/db_gis/index_en.htm

¹⁸ <http://wrdc.mgo.rssi.ru/>

¹⁹ <http://eca.knmi.nl/>

Accessibility by road

ESPON GEOSPECS used the EuroRegionalMap V30-31 road model for all countries with the exception of Western Balkans, Bulgaria and Turkey for which they were missing. In these countries, the Eurogeographics road model has been replaced by Open Street Map²⁰. The limited number of secondary roads in Open Street Map, however, creates some bias in the analyses that must be kept in mind when interpreting results.

The processing methods for the calculation of travel times based on these road models are described in Section 2.2 of the scientific report. The general principle is that an impedance is calculated for each grid cell across Europe, based on the roads going through it, its land cover, topography (terrain roughness) and the presence of rivers or railroads.

Accessibility by Air

Air accessibility calculations are based on data extracted from Eurostat databases in cooperation with the ESPON TRACC project. This extraction covers all airports with more than 150,000 passengers per year and air connections with more than 15,000 passengers per year.

To give a measure of "air connectivity" of municipalities, the first step was to delineate areas accessible within 45 minutes around airports, using the same type of method as for urban areas (see Section 2.2 of the scientific report). This has made it possible both to identify municipalities within 45 minutes of airports and to calculate the total population within this travel-time around each airport.

In a second step, air connectivity was calculated by combining the matrix of flight connections and the data on the population within 45 minutes from airports. The total number of persons that can be reached with non-stop flights from airports situated within 45 minutes and travelling a maximum of 45 minutes from the destination airport is used as a proxy for "air connectivity". It should be noted that populations situated within 45 minutes from multiple airports are counted multiple times, i.e., in relation to each airport.

²⁰ <http://www.openstreetmap.org/>

Discontinuities along borders

The World Bank database provides comprehensive and harmonized lists of indicators at NUTS0 level for most of world's countries. Furthermore, it covers a wide range of topics related to development issues and including: Agriculture & Rural Development, Health, Aid Effectiveness, Infrastructure, Climate Change, Labour & Social Protection, Economic Policy & External Debt, Poverty, Education, Private Sector, Energy & Mining, Public Sector, Environment, Science & Technology, Financial Sector, Social Development, Gender and Urban Development.

These data have been used to map border discontinuities, especially between the ESPON space and neighbouring countries, in continental Europe as well as in the Outermost Regions. Data on the efficiency of customs procedures were also used to characterise borders.

Database for Turkey

Digital LAU1 boundaries for Turkey have been compiled from Harita Genel Komutanligi (General command of mapping) and have been adjusted to fit with EuroBoundaryMap limits of coast, borders and lakes.

Socio-economic data at the LAU1 level have been compiled from TurkStat by Oğuz Işık of the Middle East Technical University in Ankara. These datasets include demographic data with 10-year trends, levels of education, population by age group, and employment by branch.

INTERREG

Indicators of age and maturity of decentralised cross border co-operation in Europe are based upon a concept developed (and data gathered) by Thomas Stumm for the Commission's INTERREG III ex-post evaluation (PANTEIA, 2009).²¹

Data on Outermost Regions

Additional data on available income, health and education have been collected from national sources, to cover aspects of particular relevance in the context of Outermost Regions. These data were either at level of LAU2 (France) or of groups of LAU2 (Spain and Portugal).

²¹ PANTEIA (2009)

3. Conceptual understanding and delineation of GEOSPECS categories

3.1 GEOSPECS categories as social, cultural and political constructs

In order to be able to characterize GEOSPECS areas in socio-economic terms, it is necessary to delineate them. The delineation has to be based on the coherent conceptualisation of each GEOSPECS category. Although this may seem straightforward, there are a number of potential pitfalls. Many of the difficulties of elaborating a pan-European, coherent understanding of each category relate to the categories being a *social construct* as much as a physical reality. Even though the concepts "mountain", "island" and "coast" exist in every language, and even though they appear to be "objective" physical categories, the perception of these notions varies – sometimes from country to country, sometimes from region to region, and sometimes with the topic/policy field that is being considered.

The added challenge for GEOSPECS is that the project does not only study categories that are clearly *geographical* (i.e. distinguishable by physical features, namely mountains, islands and coasts), but also one category that is defined purely by *demographic* factors (or settlement patterns), namely sparsely populated areas, and one that is defined purely in relation to a *political* construct, namely border areas. In addition, one category – Outermost Regions – can be called a mixture of geographical factors (remoteness from the European mainland) and political factors (as the status of "OR" as opposed to "OCT" is the result of political decisions). The last category – Inner Peripheries – is arguably not a "geographic specificity" at all, as its main defining characteristics are related to economic and social trends, and thus the line between "definition of geographic specificity" and "impact of geographic specificity" is hard to draw.

Table 6 Defining features by GEOSPECS category

Definition based on...	Category
Geographic factors	Mountains
	Islands
	Coasts
Political factors	Outermost Regions
	Borders
Demographic factors	Sparsely Populated Areas
Economic and social factors	Inner Peripheries

Regardless of *how* they are defined, the presence of geographic specificities has impacts on the social and economic characteristics of the respective areas; though it should be noted that this may be a tautology for Inner Peripheries, as they are defined by some of these characteristics. This characterization of GEOSPECS categories is set out in chapter 4 of the present report.

In addition, there is also a “cultural” dimension to them, as many geographic specificities give rise to a strong sense of identity of the local population. Given that many of the GEOSPECS areas are 1) clearly distinguishable from their surroundings and 2) relatively isolated (communities on islands, in mountain valleys, in remote sparsely populated areas, or Outermost Regions), the perception of “us” versus “them” is often particularly strong (and may be associated with the emergence, or preservation, of particular traditions, habits, or dialects). These emotional factors can be built upon when trying to rally actors behind objectives or strategies of local development. At the same time, it means that the definitions are sensitive, and scientific delineations that do not align with local perceptions of geographic specificity may cause irritation.

Since these local (or even national) perceptions differ, a European framework for geographic specificity will have to find a common denominator / apply the most logical criteria from a European perspective.

The least controversial of all categories are islands, generally perceived as lands surrounded by water: the only question being whether an island with a bridge to the mainland can be considered together with “real” islands, as both face different challenges. For mountains, it is the lower boundary that is controversial. For instance, taking into account both cultural perceptions and the possibilities for agriculture, the altitude at which a “mountain” is deemed to start is much higher in Switzerland (an almost

entirely mountainous country) than in Ireland (where only very few mountains can be distinguished).

For coasts, perceptions differ not so much according to nations, but according to the use of the coast that is considered. Different coastal delimitations exist for purposes of fisheries, shipping, species conservation, freshwater protection, recreational activities, etc. All definitions aim to establish a strip of a particular width as measured from the coastline, but some definitions apply to the marine area, some to the terrestrial area, and some to both. International Conventions, the EU and States apply their delineations according to purpose. Any particular definition of width (in terms of kilometres) of the terrestrial coastal strip may be applicable in some areas, but illogical in others (where, for instance, the terrain makes it much more time-consuming to travel the same distance). Similarly for border areas, while the border *line* itself is clearly defined, the perception of whether one finds oneself in a border *area* - or where the "border area" ends and the "interior" begins - may vary not only from community to community, but perhaps even from individual to individual.

The issue of sparse population density was introduced to the EU with the accession of Finland and Sweden, and therefore the criteria used for delineation (commonly under 12.5 inhabitants per square kilometre) is one that is tailored to the situation in these countries. GEOSPECS, however, uses a different method to delineate these areas (related to population potential, see below), and therefore also identifies other areas (particularly in Spain) as "sparsely populated". However, in the Spanish context, these areas have never been designated as such, rather being referred to as "depopulating areas" or "less favoured areas". Again, it becomes evident that perception of geographic specificity (in this case sparsity) depends on context.

Inner peripheries are a separate case. They have never been addressed at European level, and only a few countries mention them in policy documents. Interviews with experts from Belgium, the Netherlands and Germany have shown that the definitions used in these countries vary. However, they all referred to below-average performance in not only economic, but also demographic terms (outmigration playing a significant role). It then becomes difficult to distinguish their delineation from their performance, and they are thus arguably not a "geographic specificity" at all. Inner Peripheries are nevertheless a case in point when arguing that local perception plays a major role for local identity: while these areas are dubbed "inner peripheries" in some countries, they might receive a different label ("regions in transition"? even "rural areas"?) in others. Also, while some stakeholders stress the negatives (economic stagnation),

other stress the potentials (“green living spaces for urban population”). In addition, the general attitude towards distance varies across Europe. In parts of Scandinavia, it may be acceptable to drive for several hours for a simple shopping trip, an idea that would be rejected in most of the rest of Europe. Thereby, something that would be designated as an “inner periphery” in Scandinavia might simply be a “periphery” in other parts of Europe. Apart from being socially “constructed” through the (varying) perceptions of local population, GEOSPECS areas are also constructed politically, with increasing recognition in policy documents. Even though it may be difficult to find definitions that apply for the entire continent, certain policies have attempted this, sometimes causing irritation with local stakeholders. Only EU policies can be considered here.

Recently, categories of geographic specificity have received more and more recognition in EU policy documents (see also a more detailed description in the GEOSPECS Inception report). Of greatest significance, Article 174 of the TFEU mentions regions which “suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and island, crossborder and mountain regions”. Before that, the Second Cohesion Report (2001) already referred to “regions that face particular challenges”, such as border regions, mountainous regions, or islands. The Green Paper on Territorial Cohesion (2008) mentions three types of regions with geographic specificities that face particular development challenges: mountains, islands, and sparsely populated regions (while also mentioning that this list is not exhaustive). The current legislative proposal for future Cohesion Policy (2014-2020), in line with the Commission's proposal for a multi-annual financial framework, explicitly foresees an extra allocation for Outermost and sparsely populated regions. Furthermore, specific rules already exist for mountain areas (in Agricultural policy), for Outermost Regions (in both Cohesion policy and Agricultural policy), for border regions (under Cohesion policy), for small islands (under competition law), and for SPA (under competition law and Cohesion policy).

While all these measures show that areas with geographic specificities are increasingly *recognized* at European level (and also that they are mainly approached as a subset of disadvantaged and/or “less favoured” regions), the texts are also accompanied by definitions, some of which are more explicit than others.

Outermost Regions are politically constructed by definition, as they are exhaustively listed in Article 349 of the TFEU.

Border regions – apart from referring to a political construct, the border – are, at European level, approached through the funding instruments

supporting cross-border cooperation initiatives, particularly INTERREG. "Border regions" are therefore quite often simply those which are eligible for INTERREG funding.

EU practice has been to recognise as an "island region" any territory totally surrounded by water, with no fixed link between it and the mainland and without the capital city of any Member State.

Interestingly, the definition of mountain areas is left to the Member States. This is the case both for the Less Favoured Areas scheme under the Common Agricultural Policy, as also for the current legislative proposal for EU Cohesion Policy after 2013 and discussions regarding a reserved term for mountain foods. This shows that some definitions may be too strongly rooted in national perceptions to be harmonized across Europe.

The legislative proposal for future Cohesion Policy defines both sparsely populated areas (less than 50 inhabitants per square kilometre) and very sparsely populated areas (less than 8 inhabitants per square kilometre). However, in the Green Paper on Territorial Cohesion, sparsely populated areas are defined as NUTS3 regions with a population density of less than 12.5 inhabitants per square kilometre.

As mentioned above, the definition of coasts varies according to policy sector, and no single accepted definition exists.

This brief listing demonstrates that policy also plays a role in defining these areas, i.e., that their definition is at least partly a political construct. The example of border areas, in particular, shows how a definition deriving from policy can take up a "life of its own". If border regions are defined as "those regions eligible for INTERREG funding", there is a risk of a circular argument.

Lastly, when speaking of the "political construction" of territories, it is necessary to also point out that administrative boundaries often have a significant impact on delineation. For instance, if "population density" is applied as a criterion, this must by definition be population density *in a particular pre-defined area*, and this area will usually be an administrative unit (as in the case of the Green Paper, which defined SPAs as NUTS3 of < 12.5 inhabitants/km²). Therefore, the administrative boundaries have a strong impact on which region is defined as sparsely populated. The same is true for coastal and border regions: If one takes "NUTS 3 regions adjacent to a coast" / "adjacent to a border", it is the size of the NUTS3 region that defines the size of the border or coastal area.

GEOSPECS, however, considers that these definitions are not always appropriate for capturing the true situation at the local level, or (in the case of SPA) do not take into account the main problem (the issue of

sparsity is not that there are few persons per land unit, the problem is that the small size of individual localities and the wide distances between them effectively limits the population of functional regions). The following sets out the delineations used by GEOSPECS, and their founding in popular perception, history, and policies.

3.2 Conceptual understandings and delineations of the GEOSPECS categories

3.2.1 Mountains

The delineation of mountains used in GEOSPECS is essentially topographic and is consistent with the prevailing perception of mountains in modern Western societies: as a type of spatial entity characterized by its three dimensions in space. To understand the origins and objectives of this delineation, it is useful to proceed in two stages: first, recalling the conditions of emergence and diffusion of a modern concept of mountains in the European culture (see Debarbieux and Rudaz, 2010; Mathieu, 2011); and, second, indicating the procedures used for the statistical and cartographic definition of mountains in public policies.

The mountain as a spatial entity

The modern perception of mountains has emerged since the 18th Century, and contrasts with previous concepts that have existed as popular images. In most languages and European societies before the Enlightenment, a mountain was perceived (and designated as such) if a contrast in landscape allowed one piece of landscape situated above (e.g., a plateau, called the Mountain of Reims, in France) to be conspicuous from a particular observation location (e.g., the city of Reims). The pre-modern idea of a mountain was thus relative to an observation site, and therefore to observers. The same place could be perceived as a mountain (from Reims) or not (from the plateau itself), depending on the position of the observer. It is by virtue of this pre-modern and popular understanding that a number of places have been named "mountains" (*montagne, berg, montana*, etc.) because they formed a marked contrast with their surroundings. The toponymy in many European regions (Mount St. Genevieve in Paris, the "mountains of Rome", requalified as the "hills of Rome" at the end of the 18th century, Maastrichtberg, etc) and North American regions (the Mountain of Montreal, Little Mountain in Vancouver, etc.) testify to this heritage and its importance in popular language. The

same terms could also designate other types of entities: *berg* for mining sites in Germany, *montagne* for high pastures in the Franco-Provencal world, etc.

Despite the survival of many old usages of the word mountain, European societies are now largely familiar with the naturalist and objectivist meaning which asserted itself in the dictionaries of the 18th century. Education and popular science have played a decisive role in the widespread adoption of this modern usage by western societies. This understanding consists of isolating a geographical entity using criteria considered as objective: mainly criteria of altitude and slope. The mountain thus became a kind of natural entity, a view made manifest through measuring and mapping, and thus independent from the location and viewpoint of the observer. One can say that it was made objective, i.e. specified by an exercise of objectification, thanks to instrumentation and the application of naturalist and geographic knowledge.

When moving from the status of a type of landscape contrast to one of a physical entity in itself, the mountain as a category of cognition allowed the specification of a number of subcategories, which played a role in the structuring of perceptions by societies and in the development of public policies.

The mountain as a type of natural entity led to the identification of an ethnotype – the mountain dweller, i.e., one who lives in this kind of environment and is influenced by it – who, in some countries, became an important figure in the imagery of the nation (e.g., in Switzerland, Slovenia, Italy, Romania, or Poland). This designation, adopted initially by scholars, philosophers and tourists, has become a way of reformulating collective identities and inspiring the creation of lobbying organisations, both national (in Switzerland, France and Italy) and European (e.g., the *Association Européenne des Elus de Montagne*).

The idea of identifying mountains as a type of natural entity, and thus as a type of geographical region, has also led to the specification of activities – mountain agriculture, mountain industry, mountain tourism, etc. – and to the definition and implementation of public policies. Forest policies in the Alpine and Pyrenean countries in the second half of the 19th century thus clearly targeted regions designated as “mountainous” for activities of reforestation and enclosure, to protect the interior valleys and the urban areas around the main massifs from flooding. On these occasions, the “mountain farmer” and more generally the “mountain dweller” was often singled out as responsible for downstream destruction caused by floods. Energy policies in several European countries since the beginning of the 20th century have also targeted mountain regions as potential sites for

installations, with the development and adoption of specific technologies (mainly dams). Finally, "mountain tourism" gradually emerged, based not so much on summer visits, but rather thanks to the rapid and spectacular development of winter sports since the inter-war period.

The elaboration of a scholarly, naturalistic and regional conception of the idea of mountains since the 18th Century, and its very wide diffusion in the European societies since the mid-19th Century, thus had numerous and varied effects on the perceptions of national societies, the emergence of new collective identities, and the problematization of issues of economic development and resource management. From the category of scholarly knowledge, 'mountain' has turned into both a category of linguistic and spatial practices of all European societies, and a category of action, primarily public action, thanks to (inter alia) the inclination to territorialize the public policies in Europe since the 1960s.

Objectives and terms of a delineation of European mountains

The adoption of a modern, naturalistic, view of mountains made delineation possible. Scientific methods, varied and contentious, are not presented here. Only definitions adopted in public policies and administrations are discussed below.

Generally, topographical criteria of altitude and slope prevail in existing national definitions of mountains, notably in cadastral documents (e.g., in Switzerland and Austria) and agricultural policies. This designation of mountain regions – and the choice of criteria for delimitation – is guided by the idea of *compensation of natural handicaps* in a competitive economy, and, as a backdrop, the support of the rural economy.

The definitions included in the cadastral documents pertain to the level of plots. They are sometimes restrictive, as in the case of Austria, where the official definition of mountains, inherited from the installation of the cadastre during the Empire, for a long time only included high-altitude pastures. National definitions in agricultural policies most often refer to the level of the farm or municipality (Castelein et al., 2006). In these agricultural definitions, the lower altitude limit is most often fixed between 600 and 1000 metres. This limit is – on average – higher in the South (1000m in Spain, 800m in Greece) than in the North (300m in Belgium, 350m in Poland) (Price et al., 2004). The criterion of slope takes into account production techniques, with a view to compensating the difficulty or additional cost for mechanisation. The indicators used are usually the average slope of the farm or municipality, sometimes the difference between the highest and lowest points in the territory, as in Spain. Most countries combine the two criteria, sometimes adding secondary criteria: thus, Switzerland, when elaborating the cadastre of agricultural

production between 1944 and 1949, supplemented the criteria of altitude and slope with other criteria based on “most important production factors”: “duration of vegetation period, atmospheric precipitation patterns, sunshine exposure, accessibility, etc” (Ofiamt, 1956).

Since the classification of land or farms “in mountain areas” influences the allocation of subsidies, farmers have a strong interest in these matters, as their incomes are affected. Thus a number of different pressures are exerted, and the allocation criteria are not always taken into account objectively (or ideally) in this process (Broggio, 2002).

The same criteria of slope and altitude and the same idea of compensating for natural handicaps can be found in the mountain definition used in the **Common Agricultural Policy** (CAP) of the EU. Council Directive No 75/268/EEC of 28 April 1975, on mountain and hill farming and farming in certain less-favoured areas, takes into account the geographic differences and production conditions, targeting in particular “agriculture in mountains and certain less-favoured areas” which should benefit from compensation measures. However, instead of letting the Commission determine which regions would benefit, the Directive leaves Member States to define their own zoning of mountain areas. Thus, the Member States took different approaches: countries which had already delineated a mountain area in their own agricultural policies (such as Italy in 1952 or France in 1961) generally proposed to the Commission to use the same boundaries; this definition could be broad and encompass all farms for which characteristics of altitude or slope were considered challenging. Most of the countries which joined the EU in 2004 and 2007 adopted a mountain definition according to this model; thus, it applies both in their national policies and in Community policy. Other countries did not make use of this possibility, e.g., the UK, even though most British people consider the Scottish Highlands, large parts of Wales and parts of England as clearly mountainous. Under these circumstances, the European definition of mountains appears remarkably heterogeneous, and sometimes far from dominant social perceptions which, for some, are still closely linked to considerations of landscape.

Article 18 of the most recent Community regulation on the topic – Regulation 1257/1999 on support for rural development from the EAGGF – is very explicit: “Mountain areas shall be those characterised by a considerable limitation of the possibilities for using the land and an appreciable increase in the cost of working it due, either, to the existence, because of altitude, of very difficult climatic conditions, the effect of which is substantially to shorten the growing season, or, at a lower altitude, to the presence [...] of slopes too steep for the use of machinery or requiring the use of very expensive special equipment, or to a combination of these

two factors, where [...] the combination of the two gives rise to an equivalent handicap." Europe's mountains, juxtaposing national mountain areas, thus comprise an area with limits to agricultural production, for which the criteria of definition stem from the concept of the limit itself. Evidence is to be found in the fact that regions without significant variation in elevation have been included in this definition, owing to their short growing season, e.g., areas in Finland and Sweden that, in the CAP, are classified alongside mountain regions: "Areas north of the 62nd Parallel and certain adjacent areas shall be treated in the same way as mountain areas".

Some countries have adopted delineations of mountains specifically for **tourism policy**. In France, for instance, the "mountain directive" of 1976, on the construction of ski stations and ski lifts, delineated a "high mountain" region (e.g., above 1600m altitude in the Northern Alps), in which enhanced control and specific procedures were put in place.

Countries which adopted a zoning for their **regional policy** often reuse the same criteria of slope and altitude, but apply them at the level of municipalities and extend the boundaries to cover pre-mountain municipalities and those located in the main valleys within the massifs. Examples include the definitions of mountain regions in the Swiss Law on Investment in Mountain Regions (LIM, 1974), mountain massifs in France (law of 1985), mountain regions in Austria (*Berggebiets-Sonderaktion*, 1979) and *communita montane* in Italy.

The EU's Regional Policy, initiated in 1975, does not refer to any kind of definition of mountains. It adopts a number of measures for different objectives. The main one (Objective 1) organizes financial transfers to less-developed regions (below 75% of the EU average per capita GDP). This is done at the level of NUTS 3 regions. Many of the beneficiary regions are mountainous and in the periphery of the Community space: Ireland (until the beginning of the Millennium), the Scottish Highlands, Southern Italy, and much of Spain, Portugal and Greece. In the coming decades, this rule will allow financial transfers towards the regions that joined the EU in 2004 and 2007, many of which are mountainous. However, the mountainous character of these regions is not reflected in the allocation of EU funds. The other two objectives of Regional Policy have much more limited financial envelopes: Objective 2 aims to promote competitiveness (in regions that do not come under Objective 1) and Objective 3 encourages cooperation across borders. A number of mountain regions have profited from INTERREG funding to border regions. At the end of the 1990s, about 95% of the then EU's mountain areas were estimated to have profited from European funds under Objectives 1 or 2. However, in all of these cases, the regions were not beneficiaries by virtue

of their mountainousness as such, this not being an official criterion for consideration (Broggio, 1992).

European **environmental policy** is based on a division of the territory of the EU into several biogeographic regions (11 in 2005), each with a specific combination of vegetation, climate and geological characteristics (Roekaerts, 2002). One of these regions, called "Alpine", comprises the Alps, the Pyrenees, the central Apennines and the Scandinavian mountains, the Carpathians and some Balkan massifs. The delineation of this biogeographic region is based on natural science, mainly botanical, criteria. Other massifs in Europe are part of more contiguous regions, mainly characterized by climatic criteria: the Scottish Highlands and the Cantabrian chain in Spain are part of the "Atlantic" region; the southern Apennines and the Greek and Iberian mountains (apart from the Pyrenees) are within the "Mediterranean" region; the Vosges, Harz and Giant Mountains are part of the "Continental" region, etc. However, the massifs are not delineated as such.

International treaties exist for the Alps and the Carpathians. For the Alps, the delineation is also based on criteria of slope and altitude, which are applied at the level of municipalities (Price, 1999). For the Carpathians, no precise delineation has been accepted; several national consultations have not led to a consensus. Nevertheless, the preparatory documents suggested a number of delineations (e.g., Ruffini *et al.*, 2006; UNEP, 2007). Current initiatives for the creation of similar agreements in the Balkans and the Dinaric Arc have not yet decided on the question of delineation.

Delineation of mountains in GEOSPECS

The first global delineation of mountains using consistent criteria was developed by Kapos *et al.* (2000), using the GTOPO30 global digital elevation model (DEM), which records the altitude of every square kilometre of the Earth's land surface (horizontal grid spacing of 30 arc seconds). Kapos *et al.* (2000) used this DEM to derive a detailed typology of mountains based on not only altitude, but also slope and terrain roughness (local elevation range, LER), starting from first principles and in consultation with scientists, policy-makers, and mountaineers. First, 2500 m, the threshold above which human physiology is affected by oxygen depletion, was defined as a limit above which all environments would be considered 'mountain'. Second, they considered that at middle elevations, some slope was necessary for terrain to be defined as 'mountain', and that slopes should be steeper at lower elevations. Finally, to include low-elevation mountains, the LER was evaluated for a 7 km radius around

each target cell: if the LER was at least 300 m, the cell was defined as 'mountain'. This delineation has been widely used at the global level.

In 2004, a study prepared for DG Regio (European Commission, 2004) took a similar approach. However, as mountains extend down to sea level in several parts of Europe, a European delineation required a revision of the criteria. The final selection was made, after testing 16 different combinations, on the basis of feedback from national experts, who were asked to assess the degree to which each delineation fitted prevailing national understandings of mountain areas.

Thus, mountainous grid cells were identified according to the following criteria:

- between 0 m and 300 m, the objective is only to include areas with a particularly rough landscape in the mountain delineation. For this purpose, the standard deviation of elevations between each point of the DEM and the eight cardinal points surrounding it is calculated. If this is greater than 50 m, the landscape is sufficiently rough to be considered as 'mountain' despite the low altitude.
- between 300 m and 1,000 m, areas which either meet the previously mentioned criterion or where altitudes encountered within a radius of 7 km vary by 300 meters or more are considered mountainous.
- between 1,000 m and 1,500 m, all areas which meet any of the previously mentioned criteria are considered mountainous. In addition, areas with a maximum slope of 5 ° or more between each point (to which value is assigned) and the 8 cardinal points surrounding it are also considered mountainous.
- between 1,500 m and 2,500 m, in addition to all previous criteria, areas with a maximum slope of 2 ° or more between each point (to which value is assigned) and the 8 cardinal points surrounding are also considered mountainous.
- above 2,500 m, all areas are considered mountainous.

The Fifth Cohesion Report (CEC, 2010) defined mountain regions as NUTS 3 regions where at least 50% of the population lives in a mountainous area or at least 50% of the land area is mountainous, in both cases using the same topographic criteria as in the report for the European Commission (2004). The share of population in mountain areas was estimated by overlaying the grid cells identified as mountainous in European Commission (2004) and population estimates at the same scale. However, when the grid cells are used for an approximation at the level of NUTS 3 regions, this perspective is lost, as the resulting maps generally

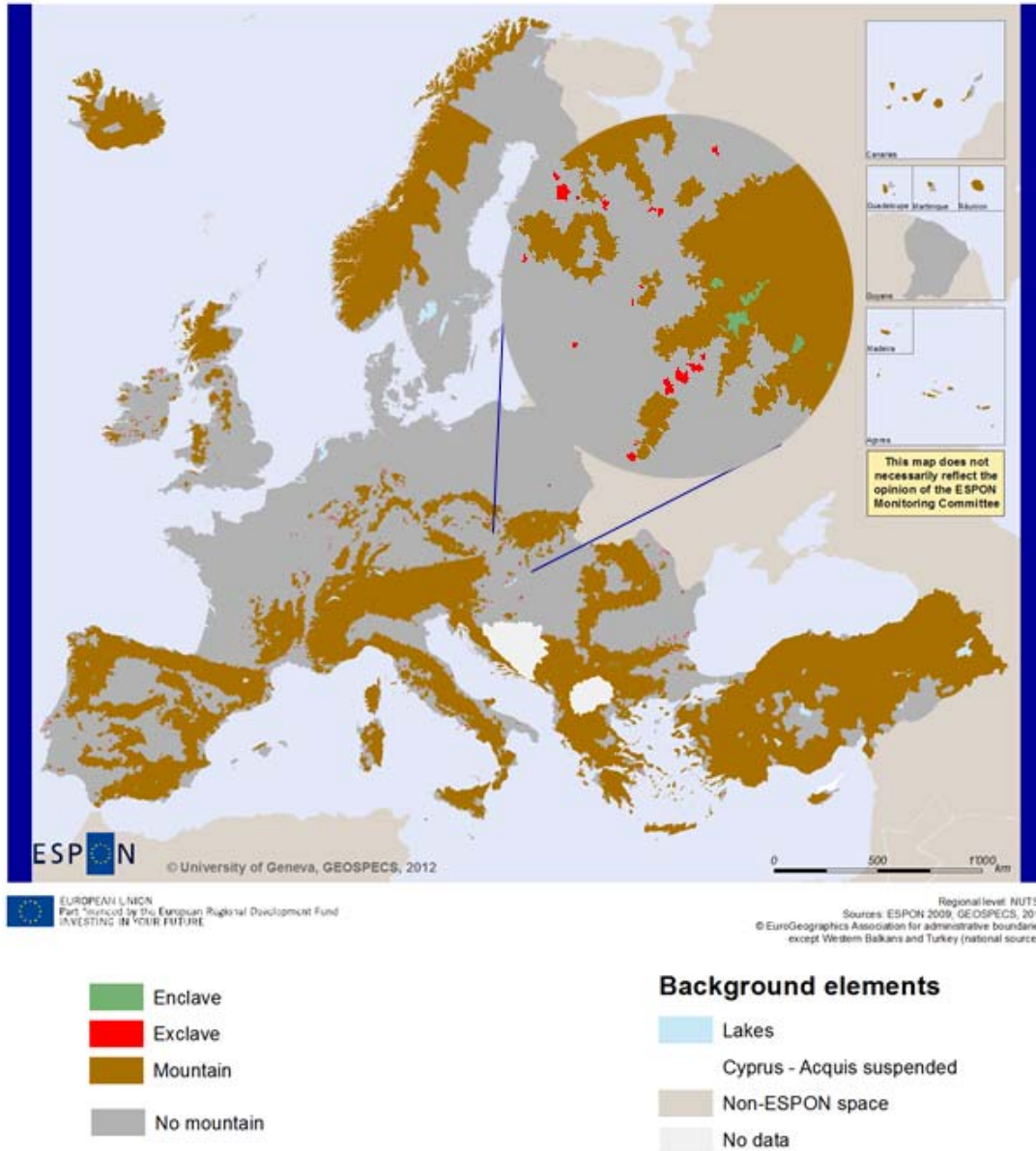
bear little resemblance to commonly accepted mountain areas. On a more fundamental level, individual grid cells with a rough topography (i.e. satisfying the above-mentioned criteria) should not *a priori* be identified as mountain areas; it is the local concentration of such cells that constitutes a mountain. Finally, and perhaps most importantly, the approximation of mountain areas at the NUTS 3 level generally makes it impossible to analyse mountain-piedmont relationships, as these two types of areas are usually included in the same regions. Major components of specific social and economic processes that are specific to mountain areas would therefore be ignored if the TPG were to apply a NUTS 3-based delineation of mountain areas.

Consequently, the TPG has used the delineation from the European Environmental Agency (2010), which applied the same criteria as in European Commission (2004) over a wider space including the entire ESPON study area. Furthermore, isolated mountainous areas of less than 10 km² were not considered, and non-mountainous areas of less than 10 km² within mountain massifs were included.

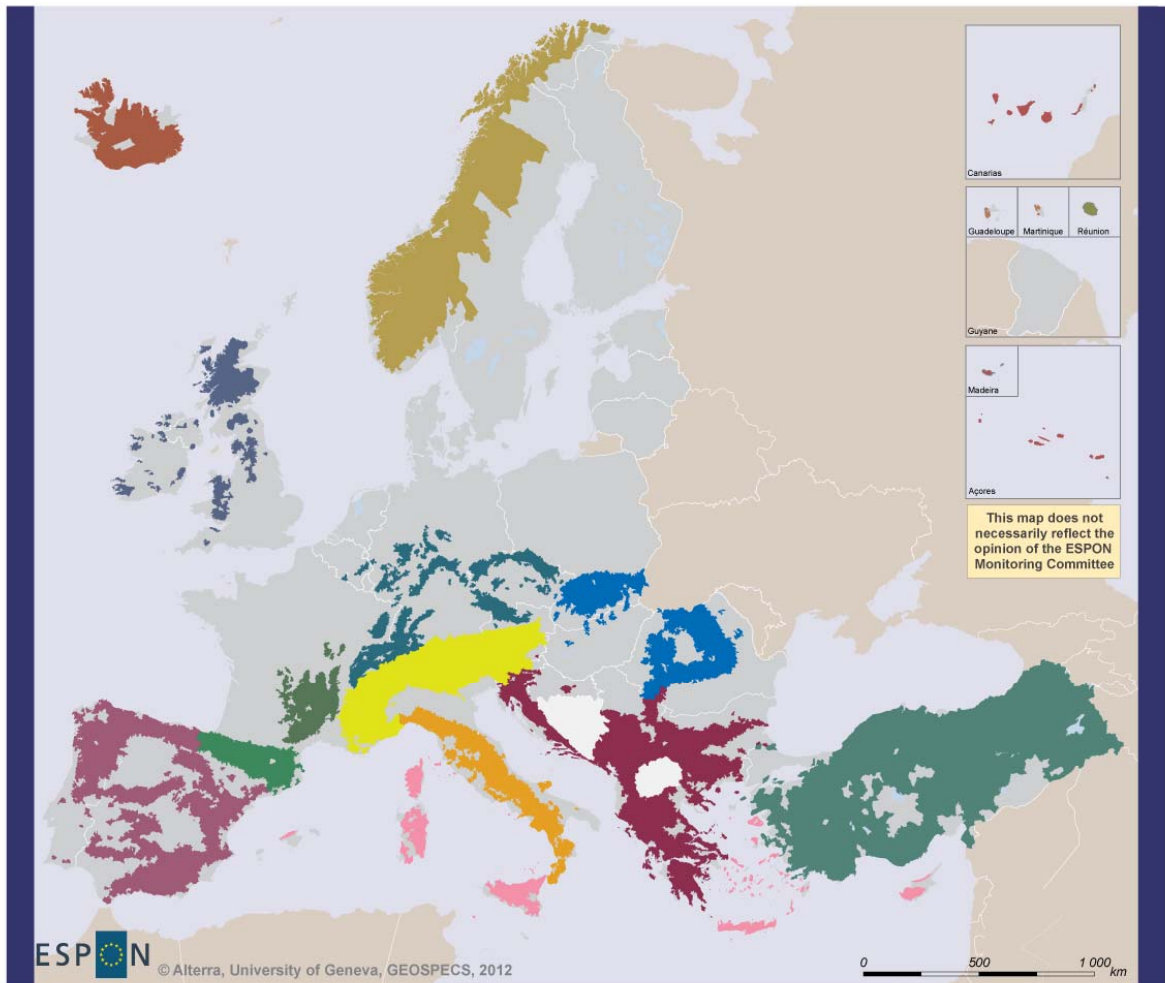
This set of grid cells with mountainous topography was approximated to municipal boundaries by considering that LAU2 units with more than 50% mountainous terrain should be considered to be mountainous. Continuous mountain areas of less than 100 km² were then identified, and designated as exclaves which were excluded from the mountain delineation except on islands of less than 1000 km². In this latter case, small mountain areas were deemed to constitute a greater potential constraint for social and economic activities, insofar as the total available land is limited. Similarly, non-mountainous groups of LAU2 units of less than 200 km² surrounded by mountain areas were identified as enclaves and included in the mountain delineation (see Map 4).

Mountain areas have been grouped into 15 massifs, defined on the basis of the delineations of the EEA (2010), with some modifications:

- Mediterranean island mountains include Sicily;
- A Central European Middle Mountain category – including the Middle Mountains of Central Europe, Germany, France and Switzerland – has been created;
- The Massif Central (including Morvan) has been defined as a separate category.



Map 4 Mountainous LAU2 units in Europe, enclaves and exclaves



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Regional level: LAU2 (except Turkey LAU1)
Source: GEOSPECS, 2011
© EuroGeographics Association for administrative boundaries
except Western Balkans and Turkey (national sources)

Massif names

 Alps	 Icelandic mountains	 ESPON Space
 Apennines	 Indian Ocean Island mountains	 No data
 Atlantic Islands mountains	 Massif central	 Non-ESPON space
 Balkans/Southeast Europe	 Mediterranean island mountains	 Lakes
 Caribbean Island mountains	 Mountains of the British Isles	
 Carpathians	 Pyrenees	
 Central European Middle mountains	 Scandinavian mountains	
 Iberian mountains	 Turkish mountains	

Map 5 Massif areas in the ESPON space

Table 7 Overview of mountainous areas in Europe

Country	Number of massifs	Number of mountain municipalities	Area of mountain areas (km ²)	Number of enclave municipalities	Area of enclaves (km ²)	Number of enclave municipalities
Albania	1	DP	DP	DP	DP	DP
Austria	3	1435	61,760.7	6	121.5	5
Belgium	1	14	1,297.5	0	-	0
Bosnia Herz.	1	DP				
Bulgaria	1	2330	53,195.8	88	1050.7	40
Switzerland	2	2380	37,472.3	36	215.7	7
Cyprus	1	316	4,264.3	6	21.7	1
Czech Republic	2	1536	25,071.1	34	526.4	42
Germany	2	2127	54,102.3	22	512.5	98
Denmark	0	0	-	0	-	0
Estonia	0	0	-	0	-	0
Spain	4	4198	272,954.9	45	1237.8	26
Finland	0	0	-	0	-	0
France	5	7352	137,252.4	71	933.3	117
FYROM	1	MD	MD	MD	MD	MD
Greece	2	710	102,675.9	3	306.6	12
Croatia	2	153	21,702.5	0	-	6
Hungary	3	143	3,524.2	0	-	25
Ireland	1	236	8,515.1	0	-	53
Iceland	1	52	86,810.7	0	-	0
Italy	4	4512	182,768.0	20	693.2	25
Kosovo	1	29	10,804.2	1	104.9	0
Liechtenstein	1	11	160.0	0	-	0
Lithuania	0	0	-	0	-	0
Luxembourg	0	0	-	0	-	5
Latvia	0	0	-	0	-	0
Montenegro	1	DP	DP	DP	DP	DP
Malta	1	2	10.6	0	-	0
Netherlands		0	-	0	-	0
Norway	1	297	267,466.5	0	-	0
Poland	2	169	16,508.0	2	82.4	1
Portugal	2	2018	31,607.9	56	551.3	32
Romania	2	951	90,749.7	9	337.6	11
Serbia		DP	DP	DP	DP	DP
Sweden	1	10	87,826.5	0	-	0
Slovenia	2	135	15,933.4	7	321.1	0
Slovakia	1	1575	29,609.2	51	605.2	17
Turkey		DP	DP	DP	DP	DP
UK	1	488	61,736.9	29	180.6	81
Sum		33179	1,665,780.6	486	7,802.5	604

MD: Missing data – DP: Data processing on-going

3.2.2 Islands

Islandness defines the situation of a place surrounded by the sea. This geographical specificity of islands arises from a discontinuity between land and sea, which in turn affects human development. These effects, however, are not absolute but can be described as occurring in relative terms. They may be attenuated by the presence of fixed links between an island and a mainland, which in itself may be regarded as reducing, though not completely eliminating, islandness itself. Transport facilities would likewise reduce the effects of islandness. The latter may, however, be exacerbated in cases where the main geographical reference point of an island is itself another island.

There are other dimensions which affect the relationship between islandness and human development. These arise out of the islandness characteristic itself, but are also a result of human activity. They include peripherality in relation to the main centres of economic and social activity, as well as dependence upon decisions taken outside the island territory itself. Islandness, peripherality and dependence are considered to constitute the elements of the concept of insularity, which relates to the wider spectrum of specific conditions impinging upon human development in island territories.

The geographical particularities of islands constitute a generally acknowledged reality. However, the substantial diversity of islands at global, national and regional levels makes the use of the concept of insularity even more relevant as it provides a common framework which within itself caters to this great diversity. Insularity is presented as a spectrum, with a number of natural or man-made characteristics resulting in islands displaying different degrees of insularity. The main characteristics of insularity are: small size of population and limited access as well as limited resources; remoteness from the European or national centre; isolation and low accessibility; unique cultural heritage; and rich but fragile natural environment. The more of these characteristics that an island exhibits, the higher the level of insularity. In addition, islands that form part of an archipelago and therefore exhibit double insularity, places them at the more acute end of the spectrum of insularity, as does having more than one geographic specificity, such as the case of mountainous islands. The critical point remains isolation, in physical but also psychological terms. The inhabitants of islands depend on air or sea transport for exports, passenger travel, and the provision of goods. In addition, the concept of 'island mentality' has a strong bearing on a

number of factors that influence development, such as entrepreneurship and governance.

Insularity is a factor that distinguishes islands from other European regions. Islands are vulnerable economically and ecologically; they are also places where the interactions between economic, political, social and environmental factors tend to be particularly rapid and severe – and especially sensitive in view of the challenges of climate change.

Using the concept of insularity has the advantage of being able to use quantitative data to make it possible to classify islands according to various criteria. This allows for the development of the concept that some islands exhibit stronger effects of insularity. Authors such as Doumenge (1983)²² worked on such classifications which were, in their own words, “difficult to measure”²³.

Royle (2001)²⁴ argues that that every island is affected in some way by a range of constraints, including small scale, size, isolation, and resource availability. In his view, peripherality is a permanent, concrete condition, not just a state of mind, and hence unalterable. An additional characteristic of most European islands is that, as well as being islands, they are also peripheral regions situated on the EU’s external borders.

The present study thus takes the concept of insularity to be determined by three main elements:

Surrounded by Sea: This refers to the geographical characteristic of islands that they are separated from the mainland by the sea. The effect of this separation is constant, notwithstanding the fact that mainland could take on different meanings in the case of island states, island regions, island municipalities, and island components of municipalities. This characteristic is also present when man-made constructions, such as bridges and tunnels, attempt to remove this separation from mainland. The idea that insularity is not only physical but also has a strong psychological element implies that, while bridges and tunnels manage to remove the physical separation of an island from the mainland, the psychological effects of separation often still remain, and the impact of these effects on development can still be felt following such infrastructural investment. In some instances, these effects can be even more

²² Viability of Small Island States; Francois Doumenge 1983 United Nations Conference on Trade & Development.

²³ Worlds Apart; Francois Doumenge. UNESCO Courier Oct 1986

²⁴ *A Geography of Islands: Small Island Insularity*. Stephen A. Royle. London and New York: Routledge, 2001.

pronounced if physical links lead to the establishment of different sub-cultures within an island.

Peripheral: Islands are peripheral to the main centres of economic, social and political activity. Islands are often an afterthought in national or European economic development plans, they are not well represented in political bodies, and are usually labelled with social stereotypes that foster an “us and them” mentality.

Dependent: Islands are dependent on the main centres of economic, social and political activity for their development. They are not able to act of their own will, but tend to find themselves in a constant reactionary role to what is happening on the mainland. This breeds a feeling of helplessness and dependence on islands which often manifests itself as requests for financial assistance, and insufficient ability to control events which may have an impact on their socio-economic development; these factors may form a vicious circle.

It is apparent that the specificities of islands can be seen in different spheres, for example: the political implications of being removed from the centres of decision making; the social implications of reduced access to better education facilities; and the cultural implications of being seen as a separate entity from the rest of the country or region. These facets of insularity add to the definition of what it is to be an island. Some elaboration on these issues follows.

Political

From a global perspective, most islands were conquered by one or another of the rival American, European, and Japanese empires during the era of colonialism and subjected not only to foreign military domination and political rule but also integration into the economic systems of their overlords. Their agricultural plantation and resource-extraction economies were developed to complement and enrich those of the colonial power and, even after independence, many remained closely integrated into these larger economies. Overly dependent on a single export, their prosperity was subject to the whims of shifting market demand in the empire. Resource depletion was also consequently a threat (Royle, 2001).²⁵

²⁵ A *Geography of Islands: Small Island Insularity*. Stephen A. Royle. London and New York: Routledge, 2001.

While many islands in recent times have achieved some form of self-administration, whether at municipal, regional or national level, they often suffer from policies promulgated at higher levels at which they have little influence. The situation of powerlessness that islands often experience in their self-governance has perhaps contributed to the sometimes unorthodox development of island politics and to particularities in governance structures.

Social

Their frequently relatively small population base, coupled with large-scale emigration, has left many islands with a paucity of seasoned public servants and forced them to depend on external intellectual resources. The lack of anonymity on small islands can furthermore foster nepotism, cronyism, patronage, and political clientism (Royle, 2001).²⁶ On the other hand, small islands exhibit homogeneity, social cohesion and a strong sense of community, as well as shared interests, closeness and intimacy. The social display of insularity is often manifested in an inward-looking society that feels detached from the rest of the country or region. This can often cause a sense of claustrophobia in inhabitants of islands, especially the younger generations, who experience a strong need to leave the island at regular intervals.

Small island societies are particularly vulnerable to outside interference, which may reach dimensions that could effectively threaten a culture or society. In terms of population, islands amplify effects which quickly die out on continents. Island populations are vulnerable because of their isolation, and may be decimated by contagious diseases introduced by immigrants or visitors. In the nineteenth and the early twentieth centuries, this happened on a number of Pacific islands ravaged by epidemics of influenza, measles, smallpox or cholera, which took a heavy death-toll (Doumenge, 1986).²⁷ Even today, many islands, especially in the Mediterranean, are feeling the burden of North African migration in a disproportionate way to European mainland.

²⁶ *A Geography of Islands: Small Island Insularity*. Stephen A. Royle. London and New York: Routledge, 2001.

²⁷ *Worlds Apart*; Francois Doumenge. UNESCO Courier Oct 1986

Cultural

The importance of islands, historically, in the artistic imagination is clear to many policy-makers, yet the "real world" of islands is often at some remove from the "island of dreams" concept (Royle, 2001).²⁸ Islands are nowadays the object of what may be considered to be a centuries-long collective perception whereby they are presented as locales of desire, as platforms of paradise, or as habitual sites of fascination, emotional offloading or religious pilgrimage.²⁹

Over time, many island territories have realized that they can 'sell' their sea, sun and sand to visitors by appealing to their modern need for travel, and thus carve out for themselves an easy route to development. This has resulted in a high dependence on a highly seasonal tourism industry which is sensitive to external economic shocks and changing trends and fashion.

Environmental

Many islands, due to their geological formation and geographical situation, are subject to earthquakes and volcanic eruptions. Islands are more susceptible to natural disasters such as droughts, typhoons, and floods. Islands suffer also from biological constraints of endemism. These are particularly onerous since fewer plant and animal species are found on islands, because of their physical isolation, than on continents. These natural populations are fragile, since their regenerative capacity and resilience are low when faced with overexploitation or strong competition from outside species introduced accidentally or for economic reasons. The proliferation of such species and their retinue of parasites and pathogenic organisms may cause ecological catastrophes. On the other hand, by virtue of their isolation, islands may constitute veritable biological sanctuaries for the preservation, and even evolution, of species which might have been eliminated in evolutionary competition among continental communities (Doumenge, 1986).³⁰

²⁸ *A Geography of Islands: Small Island Insularity*. Stephen A. Royle. London and New York: Routledge, 2001.

²⁹ Euroislands.. Annex IV

³⁰ *Worlds Apart*; Francois Doumenge. UNESCO Courier Oct 1986

Small island states

Insularity is generally constructed in relation to a mainland within the national context. In the case of “insular countries”, the situation is obviously different; key issues are whether being an island is a constitutive feature of national identity, and the degree to which insularity influences economic and social processes negatively or positively.

The category of Small Island Developing States (SIDS) is defined by the United Nations’ Department of Economic and Social Affairs (UN DESA) as “*small island and low-lying coastal countries that share similar sustainable development challenges, including small population, lack of resources, remoteness, susceptibility to natural disasters, excessive dependence on international trade and vulnerability to global developments. In addition, they suffer from lack of economies of scale, high transportation and communication costs, and costly public administration and infrastructure.*”³¹

Malta and Cyprus were included in the UN DESA’s *World Statistics Pocketbook on Small Island Developing States*³² until 2003. However, since their accession to the European Union, these countries are no longer included in the list of SIDS³³. Thus, as EU members, the UN DESA no longer considers Malta and Cyprus to have social and economic constraints due to limited size and insularity. In the Structural Funds regulations for the period 2007-2013, inclusion under the Regional competitiveness and employment objective is made conditional upon eligibility to the Cohesion Fund³⁴ (i.e. have a Gross National Income per capita below 90% of the EU average). Nevertheless, if either of these states were to exceed the threshold of eligibility to the Convergence objective, they may continue to receive particular attention according to declaration 33 of the Intergovernmental Conference, annexed to the Lisbon Treaty, which specifies that “*the Conference considers that the reference in Article 158 to island regions can include island States in their entirety, subject to the necessary criteria being met*”.

In order to contribute to discussion on the possible policy implications of this declaration, the Geospecs TPG has chosen to consider NUTS 0

³¹ http://unfccc.int/files/documentation/text/html/list_search.php?what=keywords&val=&valan=s&anf=0&id=5671

³² http://www.sidsnet.org/docshare/other/20040219161354_sids_statistics.pdf

³³ http://www.un.org/esa/dsd/dsd_aofw_sids/sids_members.shtml

³⁴ Council of the European Union (2006) *Council Regulation (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999*, Official Journal of the European Union, L 210/25. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:210:0025:0078:EN:PDF>

territories with population size and relative isolation levels that would be equivalent to, or more constraining than, those of Malta and Cyprus, as Small Island States. Despite its large territory (100,250 km²), Iceland meets these criteria. Iceland's population of only 319,062 inhabitants, is less than that of either Cyprus (871,000) and Malta (414,971). However, being a Small Island State with a large, mostly sparsely populated territory creates a series of specific development challenges (Figure 7).

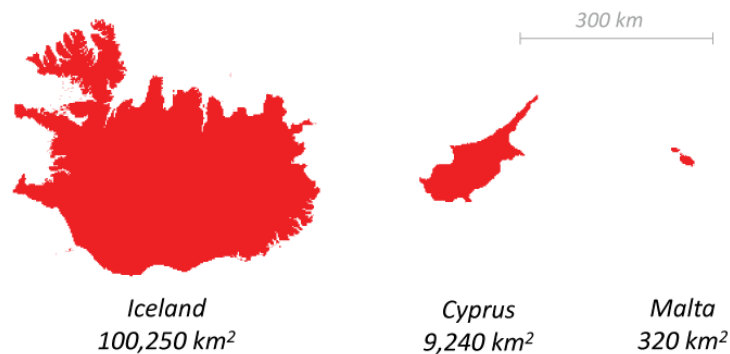


Figure 7 Comparison of geographic extent of the three Small Island States of the ESPON area

By comparison, the two other countries that could be characterised as island, Ireland and Great Britain, are considerably larger (see Figure 7). Great Britain cannot be characterised as insular, given its population of over 60 million, and the fact that it is hardly peripheral to main centres of economic and social activity. The Republic of Ireland, which has a population of 4,450,000, is not insular because it is not dependent upon external decision-making processes, as are, for example, Sicily and Sardinia. Together with Northern Ireland, the total population of island of Ireland is 6.1 million inhabitants, i.e. more than 7 times that of Cyprus. Most importantly, neither the United Kingdom nor the Republic Ireland has requested any specific treatment linked to insularity in the European context.

Fixed Links

Many islands in the ESPON area have been connected to the mainland through the construction of a fixed link. This type of connection is popular in the Nordic countries, with Norway, Finland and Sweden being the three countries with the most fixed links in Europe. Fixed links are less popular in the South, with only a few islands in the Mediterranean having such a connection.

While a fixed link makes it possible to interact with the other localities and regions without being dependent on sea or air connections, it does not necessarily remove all local social and economic constraints due to insularity. The financing of some bridges and tunnels is based on tolls, which may constitute a significant barrier to interaction between islands and the mainland. Some countries have created systems of frequently operated, toll-free ferries that may be regarded as equivalent to bridges; some are operated by cable ferries.

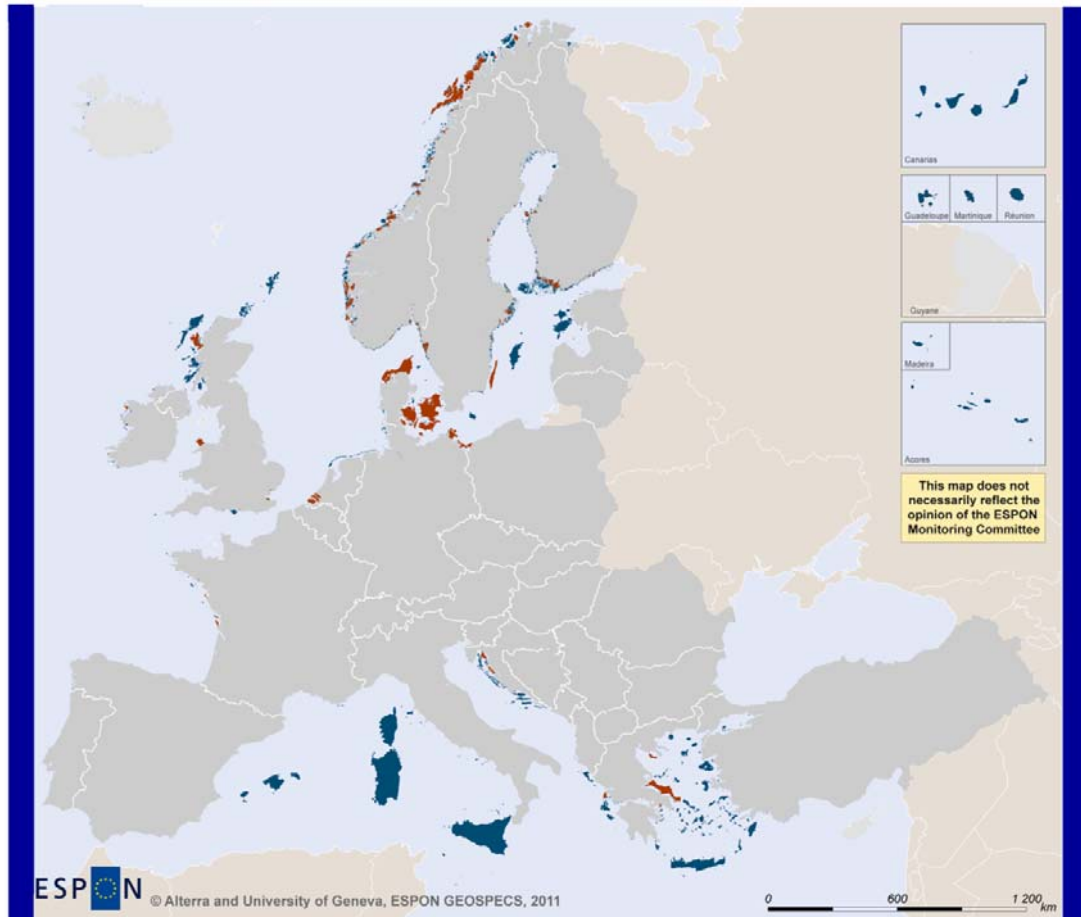
Overview of Delineation

The delineation of the insular geographic specificity thus goes beyond the mere fact that a territory is surrounded by the sea, as this may not necessarily imply the existence of the peripherality and dependence characteristics of islands. Likewise, the existence of a fixed link to a mainland may not be sufficient to overcome the peripherality and detachment characteristics associated with insularity. Furthermore, being a state makes an island less dependent upon external decision, and hence less insular. However, Small Island States would still be considered as insular, because their smallness, and consequent peripherality are not considered to outweigh the dependence factor. For the purposes of this study, the island delineation has been developed so as to best take into account these considerations (see Map 7).

The island delineation has been constructed using the highest resolution map of European municipalities available from Eurogeographics. As a starting point, all territories that are physically disjoint from the European mainland have been considered as insular, including parts of municipalities (excluding inland islands). Given that fixed links are considered to merely alter the intensity of insularity, islands connected to the mainland by a fixed road link have been included in our analysis in order to explore the social and economic relevance of insularity. Given the different challenges these islands face, they have been included as a distinct category of islands, as can be seen from Map 6.

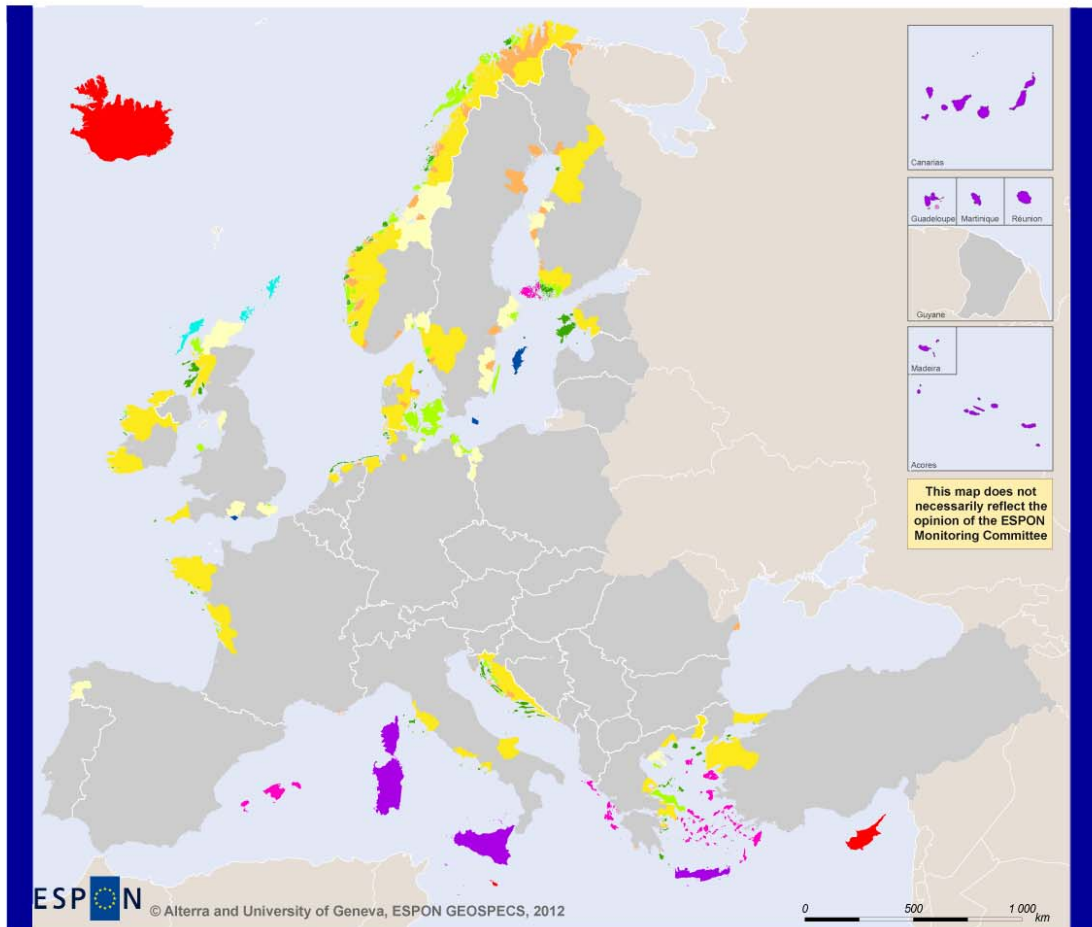
An extensive data collection exercise was carried out and municipal level data was collected for most of the ESPON area. Data on 319 islands and island municipalities in Europe have been compiled. Multiple islands belonging to one municipality have been considered as one unit, this has substantially decreased the number of island units identified in the data set. This rationalisation would apply to a number of Greek islands which

form part of the same municipality, as well as to a number of islands in Norway, Finland and Sweden. Multiple municipalities which form part of one island have been grouped together. In the case where part of an island is covered by one or more insular municipalities, while another part is covered by a municipality which is partly on the mainland, the municipalities that are entirely insular are the only ones considered.



Map 6 Preliminary identification of insular areas – excluding Island States

This map includes all territories that are disjoint from the national mainland, irrespective of their administrative status. 14,251 islands may be identified, with a total area of 136,077 km². Among these, 421 islands have an area of more than 10 km². The remaining 13,830 islands have a total area of 7,029 km² only.



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Island delineation

NUTS 0 level: Small island states

- Main island
- Secondary island municipalities: situations of double insularity

NUTS 3 level island regions

- One main island
- Archipelagos

NUTS 1/2 level island regions

- Main island
- Secondary islands municipalities: situations of double insularity
- Archipelagos

LAU 2 level: Island municipalities

- Entirely insular municipalities with a fixed link to the mainland (from one or more islands)
- Other entirely insular municipalities

- ESPON space
- Other countries

Regions and municipalities with significant insular component

- NUTS 3 regions including island municipalities with a fixed link to the mainland
- NUTS 3 regions including other island municipalities
- Municipalities within significant insular component: > 8% of the municipal territory or total island area > 10km²

Map 7 Delineation of islands and of regions and municipalities with a significant insular component

The islands identified include 105 islands that form part of an archipelago, 75 islands that have a fixed link to the mainland, and 128 islands with a mountainous component. 124 of the islands are found in the Mediterranean Sea, 44 in the Baltic Sea, 48 in the North sea, 63 in the Atlantic Sea, and 32 are located in the Norwegian and Barents Seas while the remaining 8 are Outermost islands spread over other seas.

3.2.3 Sparsely Populated Areas

The basic features of sparsity, i.e. a patchwork of geographically distant, scattered, small settlements, remind us that territories are rarely as continuous as one might think when looking at classical maps. Hence, delineating territories with sparse demographic settings thus requires taking new approaches with regard to cartography³⁵. In the GEOSPECS project, we propose to delineate 'sparsity' on several geographical levels to (1) enable us to understand the territorial extent of the 'sparsity' phenomenon across Europe and (2) provide a sound scientific base for deriving territorial policies and initiatives able to 'fit' to the needs of multiple territorial levels. Our underlying argument for understanding territorial sparsity and intending to delineate it is that it ought to be, first and foremost, understood as a specific living environment shaped and imagined through the tight relationships between 'islands' of European population and their respective territory.

As a first step, this section presents the main elements of sparsity as a political, socio-economic and cultural construct. Then, the section continues by connecting these features with the main elements of the delineation of Sparsely Populated Areas (SPA) undertaken in the GEOSPECS project.

A political construct

With regard to policy, the issue of sparsely populated areas has its origins in the Nordic countries, and was introduced in the European regional policy debate much later. Indeed, its emergence in the debate of European regional policy also has Nordic origins, as it stems from the Treaty of Accession to the EU negotiated by Finland, Norway and Sweden in the mid-1990s. During the negotiations, these countries argued in favour of a new strand of the Structural Funds specifically dedicated to their most sparsely populated regions (Gloersen, 2009). In the end, only Finland and Sweden joined the EU (in 1995), and this demand was then implemented through protocol 6 of their Treaty of Accession to the EU (Gloersen, 2009). Thus, the idea that 'sparsely populated areas' represent a specific type of territorial context for regional development policies was coined. Yet, the accession to the EU has enabled new actors to emerge in the SPA debate: regions. Through the instruments of EU Regional Policy,

³⁵ Gloersen, E. (2012) *La Finlande, la Norvège, la Suède face au projet d'une Europe polycentrique - La centralité à la marge de l'Europe*, Presses Universitaires de Rennes

regions have taken a leading role in steering the debate on the challenges and opportunities of SPA, e.g. through the transnational Nordic network of regional authorities *NSPA* (Northern Sparsely Populated Areas).

In the early 21st century, the geographical focus of territorial cohesion has shifted towards the (greater) challenge of reducing the development gap between the EU15 and the NMS12, particularly the most rural and remote parts of the latter. Hence, the debate for continued support to SPA entered a new phase around 2005 with the negotiations of the 2007-13 Structural Funds Programming Period. First, there has been a shift from an essentially Nordic focus to a wider pan-European one. In the Green paper on Territorial Cohesion³⁶ (European Commission, 2008), sparsely populated areas were identified in other parts of Europe, such as Northern Scotland, Central Spain and Southern Greece. In spite of this, some official EU documents, such as the Treaty of Lisbon³⁷, still refer to 'northern' sparsely populated areas. Nevertheless, this 'mainstreaming' of the issue turned the focus from 'uniqueness' to 'specificity'. Second, the need for continued financial support was targeted to 'enabling' growth and development rather than 'fixing' development issues.

Thus the issue of sparsity, and more specifically the challenges and opportunities it entails, has become a defining component of the policy agenda at different levels of territorial governance: for the region(s), it is a matter of economic attractiveness and the continued existence of its social model; for the State(s), it is a matter of ensuring the competitiveness of territories through labour-market integration (regional enlargement through the lens of economic development; and for the EU, it is a matter of territorial cohesion, i.e. seeking well-functioning regional economies contributing to the overarching European welfare

A multi-layered socio-economic construct

It appears difficult to distinguish the social and economic dimensions of sparsity. In the Nordic countries, the emergence of SPA as industrial territories has strongly influenced the construction of the modern states and their values. Moreover, the understanding of SPA as a socio-economic construct is also perceived through its history of settlement, migration and urbanization.

³⁶ European Commission (2008) Green Paper on Territorial Cohesion - Turning territorial diversity into strength <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0616:FIN:EN:PDF>

³⁷ Official Journal of the European Union C 306, 17.12.2007 http://europa.eu/lisbon_treaty/full_text/index_en.htm

One characteristic that seems to be shared by all European SPAs is that the land is usually not suited for large-scale agricultural activities, due to the harsh climate (either cold or hot) and difficult topography (many SPAs are also mountainous areas: see section 3.3). One could thus see sparsity as a historical legacy from non-agricultural rural places. In the pre-Industrial period, when communities had to be self-sufficient in terms of food, this meant that these territories were less attractive for settlers to develop economic activities). The only economic 'hotspots' in these regions were on the coasts (especially in Scotland, NSPA and Iceland) where the climate is milder and local production is based on fisheries or to trade and transport of other regional products like timber and minerals. These economic features shaped the SPA territories in the pre-Industrial era: access to natural resources, mostly non-usable hinterland, and communities concentrated on the coast³⁸.

The Industrial Revolution triggered a new development path for SPAs. Industrialisation throughout Europe was strongly dependent on the large-scale exploitation and consumption of material used in manufacturing processes: wood (timber, tar), coal, or ores (especially iron ore). Most of the SPAs had significant quantities of these resources (especially in the NSPA and Central Spain), giving a new impetus for the settlement of these territories: new towns developed around mines or paper-mills in the interior. Possibilities for developing water energy possibilities to meet the electricity needs of the expanding industrial activities were also of importance. However, the consequences of this socio-economic development were not merely regional. In the Nordic countries, the exploitation of natural resources played an immense role in the creation of the generous modern Nordic Welfare State, having social repercussions across entire national territories.

Another aspect is related to history of settlement and urbanization in these areas. In the Nordic countries, their main period of development coincided with industrial development and the years after the Second World War, with a rather broad array of cohorts arriving. In the Spanish context, the situation is rather different. Although the SPAs of Central Spain do not have particularly good agricultural land compared to other Spanish regions, they included numerous small villages and rural settlements. After General Franco's *Plan de Estabilización* in 1959, there was a rural exodus, especially during the 1960s and 1970s. The population declined steeply as people emigrated towards the industrial

³⁸ For more information on this subject, the reader may refer to the works of Einar Niemi (*Trekk fra Nord-Norges historie*) and Ottar Brox (*Hva skjer i Nord-Norge?*).

areas of the large cities and the coastal towns, where tourism grew exponentially. During the second half of the 20th century, the provinces of Cuenca, Soria and Teruel lost almost 40% of their total population.

Cultural anchorage: between image and identity

An important part of the long-standing cultural anchorage of SPAs in Nordic consciousness is related to pioneer settlers and the presence of the Sámi people, the last indigenous people of Europe. The cultural importance of the Sámi is much more than a mere ethnic one: they have their own language, traditions and, not least, resource-based livelihoods such as reindeer herding, fishing and hunting. The preservation of this ancient right has been translated in territorial terms by the delineation of *siidas*, i.e., a local Sámi community, or a "reindeer herding district," a member- and area-based economic unit. The ancient reindeer herding *siidas* have been the basis for the geographically-delineated economic entities of today. In the national laws, these herding units are termed as *paliskunta* ("reindeer herding cooperative") in Finland, *reinbeitedistrikt* ("reindeer pasture district") in Norway, and *sameby* ("Sámi village") in Sweden. In this sense, there is a close connection between the 'cultural' and the 'territorial' regarding the perpetuation of 'tradition' and 'identity' in the NSPA.

The cultural anchorage in the broader national consciousness in the Nordic countries has its roots in history, which means that it is also embedded in the languages. In all Nordic countries, specific expressions qualify the SPA territories, not only by labelling them but by also describing their main feature: the terms used for SPA are, in Scandinavian languages, *glesbygden*, and, in Finnish, *harvaan asutut alueet*: both refer to an internal sparse settlement structure. In Scotland or Spain, the terms given to SPA refer more to their peripheral location (*remote*), their socio-economic structure (*rural*) or their overall development challenges (*fragile, less-favoured*).

Four territorial levels of sparsity

Sparsity is evidently a complex notion in human geography. In this respect, it is unlikely that a single method for delineating these territories could provide the necessary base for a good understanding of the specific development opportunities and challenges they face. In order to retain this complexity as much as possible, while providing a clear basis for an analysis of SPAs, the delineation methodology developed in GEOSPECS

takes a three-level approach to the notion, each level producing a specific understanding of sparsity related to one of the three main 'constructs' cited above.

Sparsely Populated **AREAS**: portrays sparsity as a contiguous territorial phenomenon not bounded to administrative boundaries, mainly revealing two types of structure of such territories made of either several large 'massifs' (NSPA, Central Spain, Northern Scotland, Turkey, Iceland) or small 'islands' (in the Alps, for instance). The resulting cultural perception of sparsity and anchorage in the identity of the communities is likely to be different between the large-scale phenomenon (in the case of 'massifs') and the scattered, fragmented one (in the case of 'archipelagos').

Sparsely Populated **LOCALITIES**: essentially raises the issue of sparsity in the light of difficulties in matching the labour market supply and demand in small economies, i.e., the small size of the local economy, combined with its relative isolation from other surrounding local markets, leads to a lack of diversity in the labour market, making it more complicated for the labour market to reach an equilibrium point between the supply side (labour force) and the demand side (firms and public authorities).

REGIONS faced with demographic sparsity: essentially acknowledges that the regional level is a much appropriate level for making the synthesis between the territorial challenges and opportunities linked to sparsity and the policy apparatus.

SPARSE TERRITORIES: designates territorial entities of SPA based on a clustering of sparsely populated localities into coherent territorial ensembles, both geographically and socio-economically, in the spirit of Lévy's (2011) definition of territories as "belonging to a field of spaces relating to the social world"³⁹. This level of analysis brings together the notion of 'sparsity' as a measurable topographic feature and a specific territorial context for developing socio-economic activities.

Methodology

In our methodology, sparsity relates to a low level of population potential. The population potential represents a measurement of the number of persons that are within a reasonable commuting distance of each "point" in Europe. The commuting space for each point can be conceptualized either as "isotropic" i.e. one can commute in all directions equally, or as "directed", i.e. commuting can only occur along certain directions,

³⁹ Lévy, J. (2011) *Territory*, in Agnew J. and Duncan J.S (2011) *The Wiley-Blackwell companion to Human Geography*. Blackwell Publishing.

typically along existing transport corridors. The distance used for the isotropic population potential is calculated by using an as-the-crow-flies measurement within a radius of 50km. The directed population potential is calculated by using 45 minutes isochrones, using detailed road network modeling. Both calculations are made using grid cell data that are later aggregated to different administrative levels depending on the scale of the analysis. Equivalent criteria are also used within GEOSPECS to delineate other specificities.

The isotropic and directed models of population potential provide complementary understandings of the structure of the European territory: the former is purely based on the settlement structure, and the latter based on the structuring of the territory through the (mis)match between the settlement structure and the transport network. However, having low potential according to either of those models may have different implications with regard to policy action and relevance. Consequently, we have identified two parallel tracks for delineating low potential areas.

Sparsely Populated Areas

SPAs are delineated as the places (i.e. grid cells) in Europe with a population potential below the threshold of 100,000 persons. In the isotropic model of population potential, based on Euclidian distance of 50 km (i.e. as the crow flies), this threshold corresponds to a population density of 12.7 persons/ km². In the European policy-making spheres, the threshold of 12.5 persons/km² is generally used to identify regions (at NUTS 3 level) that fall into the 'sparsely populated' category.

According to the isotropic model, 17.2% of the ESPON space is sparse in terms of population potential. These *Sparsely Populated Areas* are mostly in Northern Europe and Mid-Spain. A few smaller areas with low population potential were also identified in the Baltic States, Corsica and some Greek islands (see blue areas in map 1).

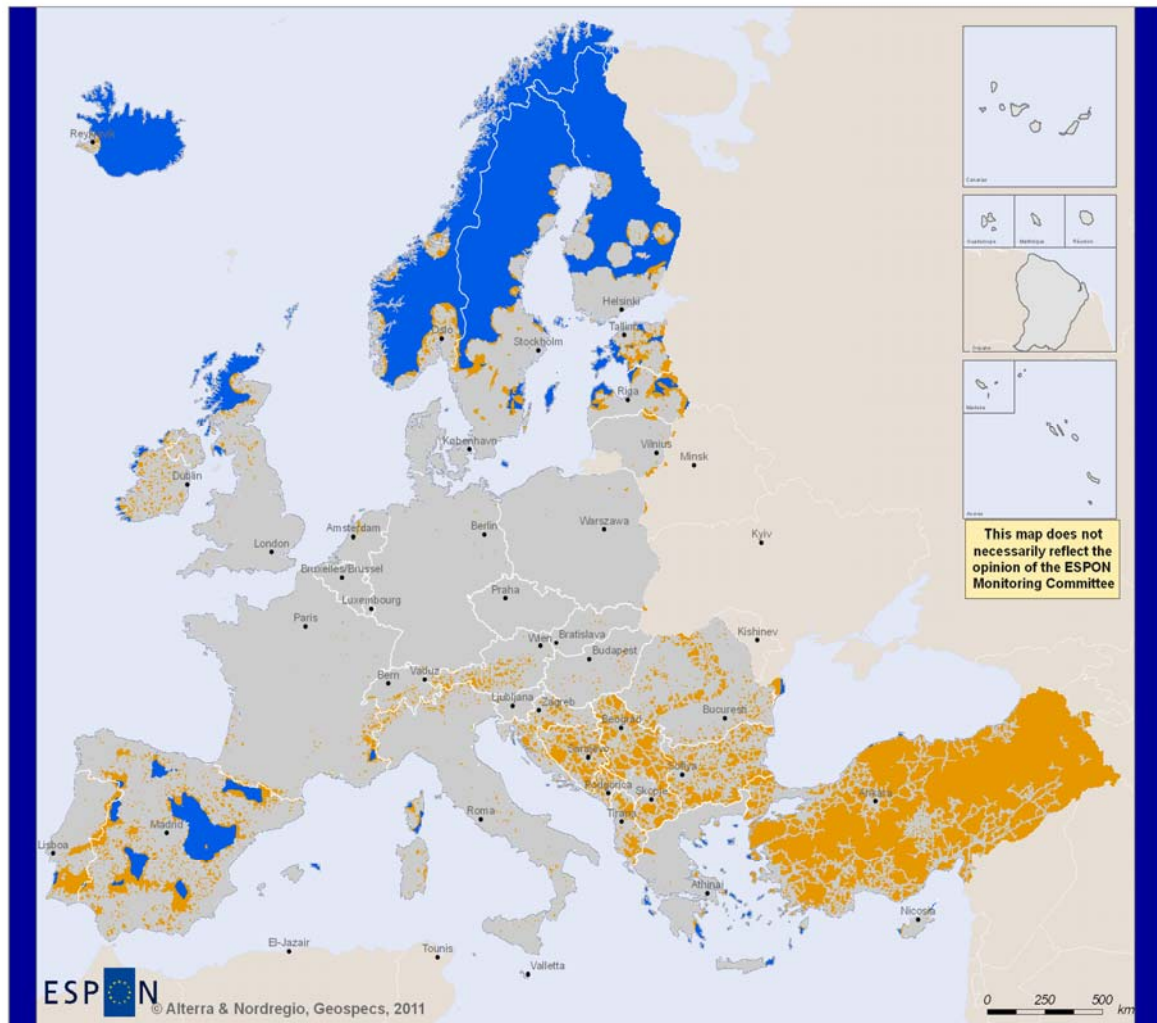
According to the directed model, based on time distances of 45 minutes on the road network, the area with low population potential covers 34.6% of the ESPON space. This figure correlates very well with the Euclidean distance of up to 50 km delineations. In addition, these *Poorly Connected Areas* can be found in vast areas in the Balkans, Turkey and in many mountain areas (see orange areas in Map 8).

Sparsely populated localities

The second level corresponds to the first aggregation of the population potential data at an administrative level. For this aggregation, the level used is the lowest level available on a pan-European basis: the LAU2 (formerly NUTS5) level. In this configuration, sparsity is understood as a local phenomenon, because it relates to how a community perceives its socio-economic integration with its surroundings. In concrete terms, sparsity 'in real life' corresponds to a relative perceived isolation of local communities from other places surrounding them. Consequently, the TPG proposes that aggregating the population potential grid cell data at the local level provides an insight to the localities that may run the risk of being isolated. For such communities, sparsity is a major challenge for their capacity for future sustainable development.

For each European locality (LAU2; LAU1 for Turkey), the proportion of the total municipal area covered by low potential areas (as defined above) was calculated. In total, 13,868 LAU2 units can be considered as 'partly sparse' or "totally sparse" as they contain at least one area with population potential below 100,000 inhabitants. There are, however, significant differences in the numbers of distance- and time-based sparse localities. While there are 2440 LAU2 units with low potential areas according to the isotropic model, there are 13,834 LAU2 units with low potential according to the directed model. 2375 LAU2 units have areas that can be classified as low potential according to both models. In addition, there are 71 localities, mostly in Spain, that could be classified as sparse according to the isotropic model, but not the directed model. All of these localities are located in the commuter catchment areas of the major cities, along major transport corridors, and are therefore excluded from the analysis.

In order to focus on the LAU2 localities (LAU1 in Turkey) where sparsity can be seen as a major challenge for regional development, only the low potential localities with at least 90% of their area covered by either isotropic or directed sparsity, are labelled as Sparsely Populated Localities or Poorly Connected Localities and thus included in the GEOSPECS delineation. According to this delineation, there are 1488 *Sparsely Populated Localities* and 2244 *Poorly Connected Localities* (Map 9).



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Regional level: GRID
Source: ESPON Database 2013
Origin of data: ALTERRA 2011
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Areas with Low Population Potential

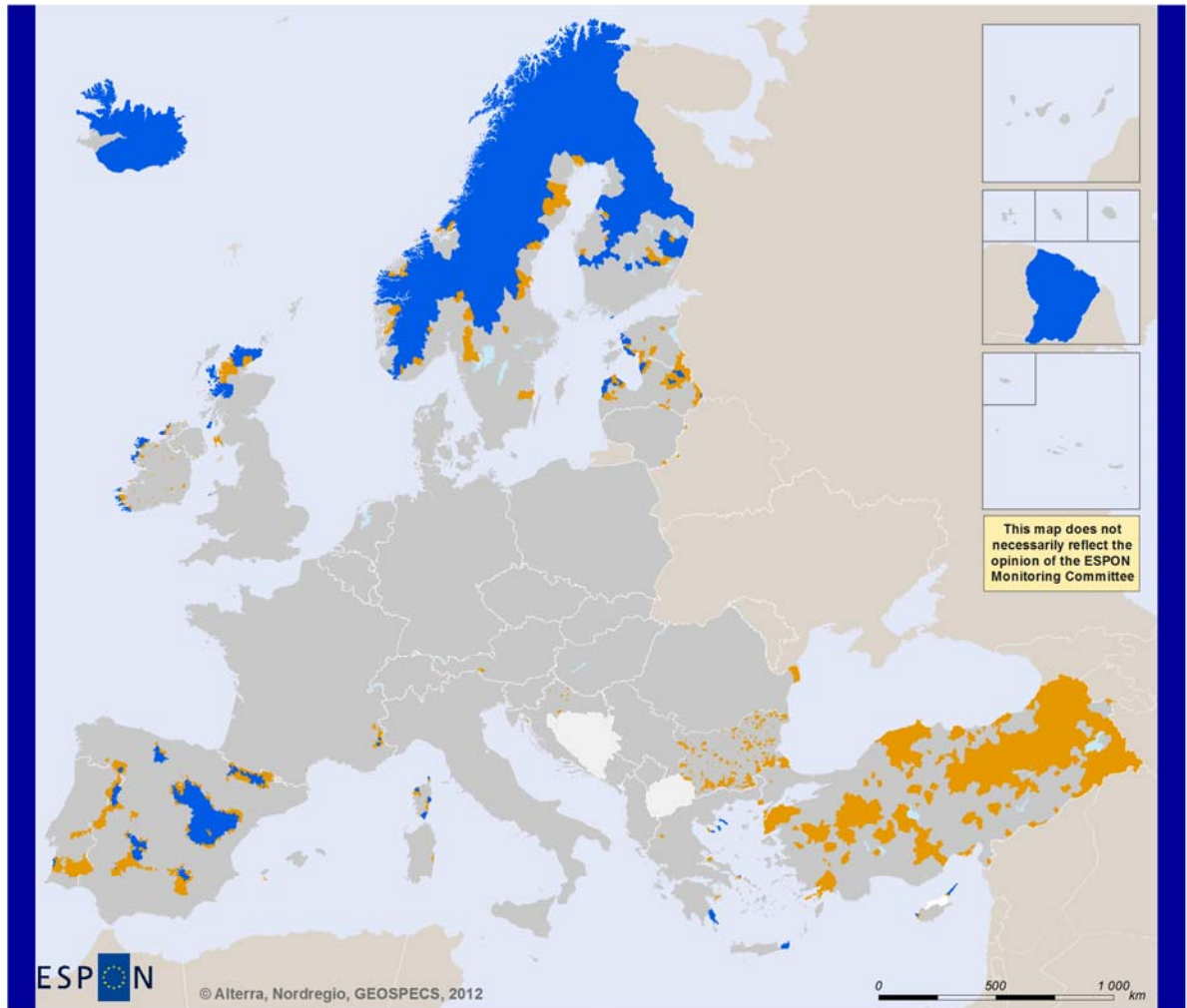
Population Potential in Persons in Areas below 100 000 Inhabitants Potential according to 50 km and 45 Minutes Delineations

- Both after 50km and 45min delinations - Sparsely Populated Areas
- 45min delination only - Poorly Connected Areas

Map 8 Sparsely populated and poorly connected areas.

This map identifies 1x1 km grid cells with a population potential of less than 100,000 inhabitants according to the isotropic and directed models.

Two parallel delineations of low population areas have been developed in GEOSPECS: Sparsely Populated Areas, where transport infrastructure does not allow compensation for the low level of human resources available in the adjacent area; and Poorly Connected Areas, where the absence or inadequacy of the transport network means that they are not able to achieve the critical mass that is ideally available to them. In addition, there are some small areas located within the 45 minutes distance but beyond the 50 km radius, located in a scattered pattern along the main transport corridors.



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Sparsely Populated and Poorly Connected LAU2s

- Sparsely Populated (according to the 50km and 45 min delineations)
- Poorly Connected (according to the 45 min delineation only)

Regional level: LAU2 (except Turkey LAU1)
Source: GEOSPECS, 2011
© EuroGeographics Association for administrative boundaries
except Western Balkans and Turkey (national sources)

- ESPON Space
- No data
- Non-ESPON space
- Lakes

Cyprus - Acquis suspended

Map 9 LAU2s with more than 90% of the total area covered by SP Areas.

Many localities in Europe contain at least some areas with a low potential population potential. However, in GEOSPECS, in GEOSPECS, the focus has been on LAU2 units where this is a predominant a feature. Only localities with over 90% sparsely populated areas have therefore been selected.

Population densities have not been used because they fail to take into account the geographic context of each LAU2 unit. Furthermore, they are largely determined by the way in which administrative boundaries are drawn.

Regions faced with demographic sparsity

The regional level is the level at which European Regional Policy is designed, implemented and monitored. In many instances, the regional level is considered the appropriate level to bring together the leverages available through European territorial policies and instruments (e.g. Structural Funds) and the development initiatives taken at local and national levels.

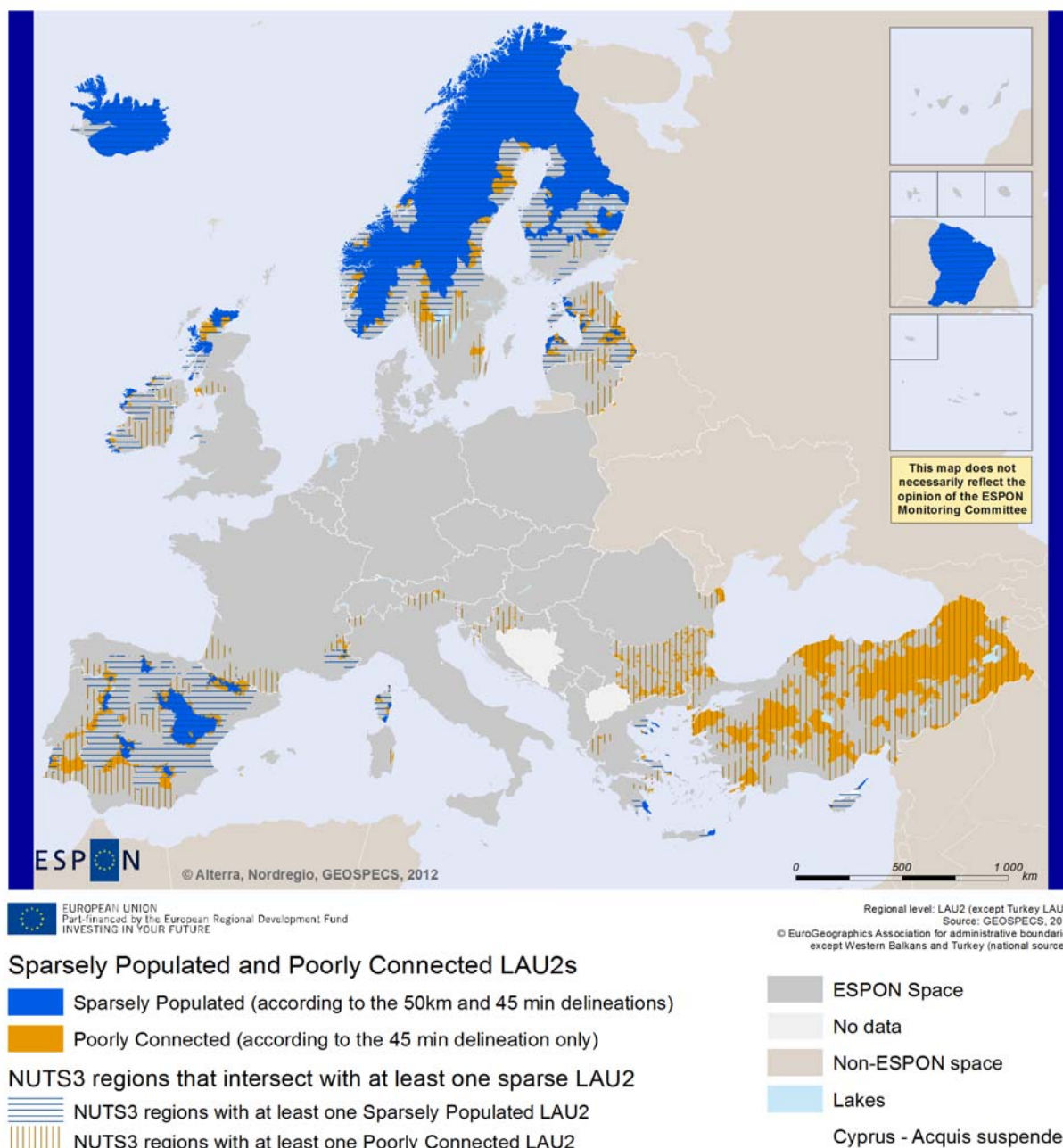
According to such criteria, sparsity becomes a 'regional' issue when a region includes at least one Sparsely Populated or Poorly Connected locality, i.e., there is at least one local community that is relatively isolated from the rest of the regional economy and labour market. In this regard, developing appropriate policy responses to mitigate the risk of 'territorial exclusion' of such communities should be on the regional agenda. At the NUTS3 level, there are 228 such regions.

In order to make it easy to compare the sparse LAU2 and NUTS3 regions, a map combining these two levels is included (Map 10).

Sparse Territories

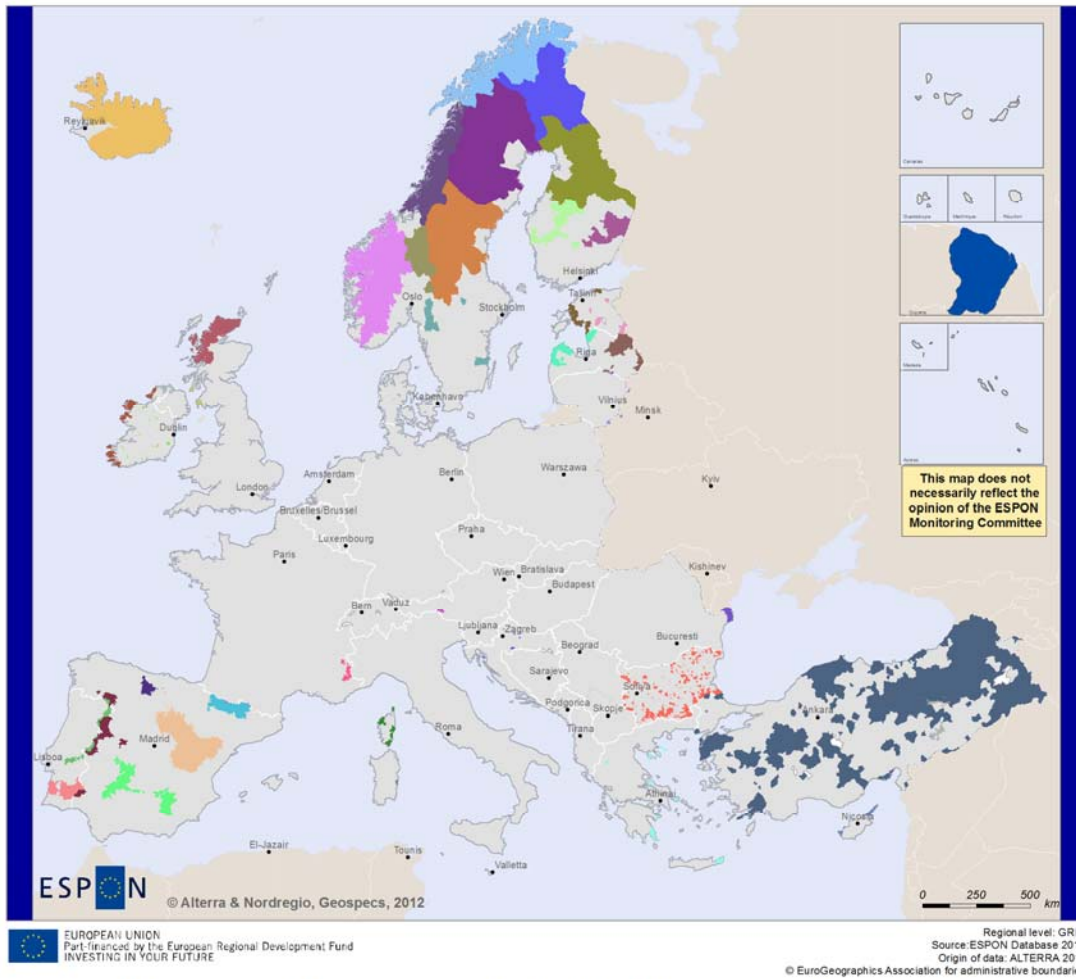
Sparse Territories (ST) are territorial 'clusters' of SPAs that form, to our understanding, relevant geographical units for developing a spatial analysis of SPA, to promote a sharper understanding of the interplay between sparsity as a territorial notion and territorial development potentials. In that respect, ST may be seen as pertinent territorial entities for framing initiatives leading to increased interactions and exchanges in the SPA, especially with regard to economic cooperation and provision of services. Moreover, the ST can be seen as coherent territories for developing integrated 'regional' economic spaces, enabling the design of development strategies based on the compatibility of local specialisations, leading to regional economic diversity and enhanced competitive advantage.

A total of 39 Sparse Territories have been identified, based on geographic contiguity and proximity and close socio-cultural proximity of sparse LAU2 units (Map 11). For most countries, the ST are based on the aggregation of the sparse units that are either 1) geographically contiguous (as in Spain) or 2) scattered within a country (as in Bulgaria). In the Nordic Countries, as the area of the ST would have been too large, the sparse areas in Finland, Norway and Sweden have been divided into larger units based on their geographic context and potential accessibility to MUAs of LAU2 units.



Map 10 LAU2 and NUTS3 regions with low population potential.

When comparing the sparse regions at the LAU2 and NUTS3 levels, the challenge of the administrative structure is visible. Many of the sparse LAU2 concentrations are located around the borders of NUTS3 regions, so that the coverage on NUTS3 level is much larger. This is particularly visible in Ireland, Scotland (UK) and Spain where a relatively large share of the country is classified as sparse at the NUTS3 level. Notably, some capital and major city regions can be classified as 'sparse' if the delineation of 'at least one LAU2 unit' is used: e.g., the regions of Ankara, Helsinki, and Madrid.



Sparsely Populated and Poorly Connected LAU2 units - Subdivision

Poorly connected Alpine municipalities	Sparse northernmost Finland	Sparse Southern Norway
Poorly connected scattered municipalities in Bulgaria	Sparse Ostrobothnia and Mid-Finland	Sparse Nordland
Sparse Cyprian outskirts	Sparse Salo and Karelia	Poorly connected Portuguese border area
French Guyane	Sparse & poorly connected municipalities in Greece	Poorly connected Southern Alentino
Sparse Estonian coast	Poorly connected scattered municipalities in Croatia	Poorly connected municipalities in North-East Romania
Poorly connected scattered municipalities in Estonia	Sparse Irish west coast	Southern Norrland with accessibility potential to MUAs
Sparse & poorly connected southern inland in Spain	Poorly connected scattered municipalities in Ireland	Poorly connected Scattered areas in Sweden
Sparse & poorly connected Spanish-Portugese boundary	Sparse municipalities in Iceland	Northern Sweden
Sparse Northern Spain	Poorly connected Sardinian coast	Poorly connected areas in Turkey
Sparse & poorly connected Spanish Pyrenees	Poorly connected scattered municipalities in Latvia	Poorly connected Scattered areas in UK
Sparse Iberian mountain fringe in Spain	Poorly connected scattered municipalities in Lithuania	Sparse & poorly connected Scottish Highlands
Poorly connected French Alps	Sparse & poorly connected municipalities in Latvia coast	
Sparse and poorly connected Corsican coast	Sparse Troms and Finnmark	
Sparse Northern and Eastern Finland	Sparse Hedmark	

Map 11 Sparse Territories: clusters of Sparsely Populated and Poorly Connected LAU2s

When comparing sparse territories at the European level, the use of clustered sparse areas can help us to understand the characteristics of those areas. These clustering can take two main forms, either as contiguous 'massifs', as in the Nordic countries, Scotland or Central Spain, or scattered 'archipelagos', as in Ireland, Bulgaria or Turkey.

The policy relevance of the sparsity debate needs to start with an adequate delimitation

Sparsely Populated Areas (SPAs) entered the vocabulary of European regional policy-making with the Treaty of Accession of Finland and Sweden. Since then, the territories of Northern Sweden and Northern and Eastern Finland have been referred to as *Northern Sparsely Populated Areas*. The Green Paper on Territorial Cohesion proved to be a turnaround in the sparsity policy debate as it suggested that SPAs can be found in other parts of Europe as well.

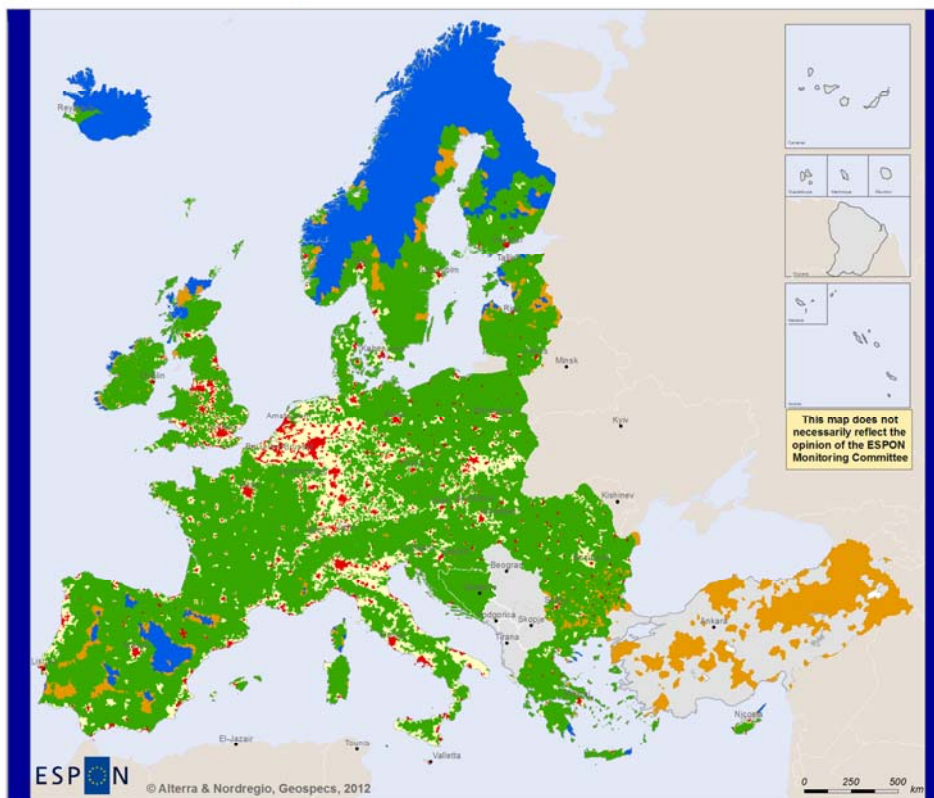
In spite of this attention to SPAs, no European institution has yet produced a pertinent definition and delimitation of such territories. The first delimitation was provided by the European Commission in the framework of the Green Paper, based on a certain threshold (12.5 persons/km²) of population density at the NUTS 3 level. The main objective was to provide policymakers with a delimitation of immediate use for allocating support funds, rather than to rigorously identify the territories that are characterised by a sparsely populated environment. From the viewpoint of the TPG, the Green Paper definition misses the fundamental understanding of sparsity as about the perception of the living conditions for communities, i.e. both people and businesses, that are isolated due to their remoteness from main agglomerations and other neighbouring small communities.

More recently, Eurostat has developed a category of territories labelled as 'thinly populated areas' (note that this avoids the term 'sparsely' in order to distinguish itself from the Commission's definition). This delimitation is also fundamentally biased, as it identifies 'thinly populated areas' as the non-urban areas of Europe, thus contrasting this territorial category with 'densely populated areas'. Thus, Eurostat does not delimitate sparsity *per se*, but rather identifies various degrees of urbanness: 'Thinly Populated Areas' are thus considered as the areas of Europe with the least urban quality – they are defined *by default*. In effect, 'Thinly Populated Areas' consist of all non-urban areas in Europe. Moreover, the definition of urban areas by Eurostat misses a fundamental feature of SPAs: the presence of dynamic local/regional urban centres at the fringe or within them. For instance, the important regional centres in the Northern part of the Nordic countries (Umeå in Sweden, Oulu in Finland or Tromsø in Norway) become 'invisible' in their typology. This is due to the methodology chosen by Eurostat that uses measures of population size and density at municipal level (and Nordic municipalities are large), thus creating this over-simplification of both urban and non-urban territories.

In this respect, GEOSPECS proposes a methodology that, if not perfect, intends to delimitate SPAs by focusing on what are understood as the key features of sparsity, i.e. the relative isolation of communities from other regional communities due to a loose settlement structure. As a result, the delimitation ends up with a more restricted territorial extent of SPAs than according to the Eurostat definition, but it is

more appropriate for use as an input in debates on regional policy as it provides a sound, understandable basis for developing adapted local and regional strategies for these territories.

Degree of Urbanisation & Sparsely Populated and Poorly Connected LAU2s



ESPON
 © Alterra & Nordregio, Geospecs, 2012
 Regional level: GRID
 Source: ESPON Database 2013
 Origin of data: ALTERRA 2011, Eurostat 2011
 © EuroGeographics Association for administrative boundaries

Degree of Urbanisation in Connection to Sparsely Populated and Poorly Connected LAU2 units

Degree of Urbanisation*

- Densely populated area
- Intermediate area
- Thinly populated area
- No data/not included

- Sparsely Populated (according to the 50km and 45 min delineations)
- Poorly Connected (according to the 45 min delineation only)

-> All Sparsely Populated & Poorly Connected areas are located on 'Thinly populated area'

Degree of urbanisation based on Eurostat definition, where:
 - Densely populated area: LAU2s which has a density of more than 500 inhabitants per km², AND where the total population is at least 50 000 inhabitants.
 - Intermediate area: LAU2s which has a density superior to 100 inhabitants per km², and either with a total population for the set of at least 50 000 inhabitants or adjacent
 - Thinly populated area: rest

Map 12 Degree of urbanisation and sparsely populated and poorly connected LAU2

3.2.4 Coastal areas

22 of the 27 EU Member States have coastlines. (Eurostat, 2010; Weinstein *et al.*, 2007; Creel, 2003). The length of the EU coastline is estimated to be slightly over 200,000 km for the ESPON space as a whole, including Turkey (source: GEOSPECS calculations). In 2006, 177 million people (34,1%) lived within commuting distance of the coast (45 minutes) of the coast in the European Union, and a 182 million (35,1%) in ESPON space (excluding Montenegro). The corresponding figures within a wider distance of 90 minutes are 236 million (45,5%) for the EU27 and 242 million (46,8%) for ESPON space (excluding Montenegro) (source: GEOSPECS calculations).

Coastal areas function as interfaces between terrestrial and marine systems. Two notions need to be distinguished:

- The *coastline* is the physical environment where marine and terrestrial systems meet, geomorphologically varying from heavy indentations to long stretches of sandy beach.
- From a functional socio-economic perspective, the *coastal zone* is an area where the proximity to the coastline has a direct effect on socio-economic structures, trends and development perspectives, e.g. in terms of employment opportunities and residential attractiveness.

A multitude of varied and sometimes contrasting efforts have been undertaken to describe and define the coastal zone. They range from looking from a policy perspective and examining its physical attributes (Crossland *et al.*, 2005; O'Hagan and Cooper, 2001; Aurocochea and Pethick, 1986) or investigating the socio-economic and philosophical make-up of the coast (Thackray, 2005). A vast array of actors has interest in the coastal zone. Coastal zones serve as fishing grounds (i.e. sources of food), focal points for trade and transport, as recreational spaces, but they are also the habitats of a number of species. Ports in their function as gateways have historically attracted industry and population, a reason why coasts can be densely populated. The conflicts of interest that result from the high number of activities in coastal zones is reflected in policy documents: In general coastal and marine policy in Europe is driven by the negative impacts from human activities on natural coastal and marine resources, resulting in a host of policies that concern for example water management, pollution, bathing water, nitrates, shellfish, conservation, renewable energy, climate adaptation, floods and erosion.

This section explores the concept of the European coast. The objective is to identify in what respects it may be relevant to consider “coastal areas” as a category of territories for which dedicated policy measures or specific adaptations of regulation and policies would be needed.

The focus is on specific preconditions for social and economic development. However, a holistic approach to this issue implies that one needs to take into account aspects, as well as trying to better understand the physical environment that shapes the coast.

Historical and cultural concept of the coast

Almost every length of coastline bears a historic meaning and value (Thackray, 2005). When people first settled on the coast, the sea was viewed as an obstacle and a dangerous place (Amos and Manica, 2006; Thackray, 2005). Such views were expressed in numerous maritime legends, for example in the Danish King Canute’s eternal battle with the sea, demonstrating the limit of man’s power over the tides (Forte *et al.*, 2005). On the other hand, the sea has consistently attracted people to its shores (Martínez *et al.*, 2006). Archaeological evidence has shown that much of the diet of early humans consisted of intertidal shellfish (Marean *et al.*, 2007). European coasts have been settled on, fished off as well as ploughed, grazed, quarried, mined, visited and fought for (Thackray, 2005), and became focal points for trade (Mee, 2010; Weinstein, 2009). Forte *et al.* (2005) argue that the success of the Viking colonial episodes of the 8th and 9th centuries may not have occurred without them being a seafaring people intrinsically linked to the coast. The Viking expansion was also responsible for laying the foundations for urban settlements and trading economies of much of coastal UK, Ireland and northern France.

Famine, war and colonisation have also contributed to historical migration towards the coast: e.g., between the 15th and 19th centuries, population movement towards the European coasts was caused by inter-regional wars and colonialism (Mee, 2010). Successive waves of human migration to the coast have continued right up to the present day, and have now reached their most intense level (Curran and Agardy, 2004). More recently, economic necessity has provided the impetus for the enormous shift of the world’s population to the coast (Weinstein, 2009; Creel, 2003), resulting in large coastal conurbations or “mega-cities” drawing even more people seeking employment. In Europe, coastal regions are home to 196 million inhabitants, most of who live in cities (Eurostat, 2010). By extension, this phenomenon, plus seasonal visitors, can have a negative

impact not only on the ecology of the coasts but replacing a traditional way of life, often accompanied by loss of associated cultural assets. According to UNESCO (2011), many of Europe's threatened languages are found in coastal regions, e.g., Asturian, Basque, Breton, Irish, many of the Sami languages and Welsh; some are already extinct, such as Cornish, Manx Gaelic and Dalmatian.

In a cultural sense, the coast has inspired and sustained artists, musicians and writers throughout the centuries. Art, in the form of literature, paintings and music, documents people's history with and perception of the coast (Thackray, 2005). Music is a very powerful element of coastal and marine culture, where sea songs or "shanties" were sung to keep the rhythm of work onboard ships. These folk songs have survived as an important part of Europe's cultural heritage, describing the land and seascape, the people and a way of life shaped by the sea. The coast and the sea, perhaps, conjure up no stronger image than of those who work there, in particular, the fishermen. Much of the music and poetry of the sea derives from the intimate connection that fishermen have with it, a connection that typically permeates through several generations: fishing is also important for communities not just as a means of earning a living, but as a way of life with more deeply embedded cultural relationships (Urquhart and Acott, 2011). The rich cultural heritage linked to fishing in Europe also contributes to attracting visitors to the coasts, thus laying a foundation for the economic success of coastal tourism. For these visitors, the coastline is associated with recreation and relaxation. It is seen as a place of holiday where scenic land and seascapes, as well as particular cultures and histories associated with the coast and the sea, are the main attractions (Rodriguez, 2001).

The coast from the social and economic point of view

Economy

The economic value of the coast can be assessed in a number of different ways (Barbier *et al.*, 2011; Cooper, 2009; Martínez *et al.*, 2006). Cooper (2009), for example, suggests three approaches: the economic value of sectors of human activity; ecosystem services; and the market value of property and land in the coastal zone. The largest influence on coastal economies is the first approach, the sectors of human activity. Evidence suggests that international trade increases significantly in coastal economies (Behrens *et al.*, 2006) compared to their landlocked counterparts: e.g., on average, trade volume for landlocked countries is less than 40% compared to countries with a sea border (Limao and

Venables, 2001). The second of Cooper's approaches, ecosystem services, is defined as value derived from the physical environment for the benefit of people, such as seafood, drinking water, energy, minerals, and regulating services such as carbon sequestration, water purification and nutrient dispersal. Such services are intrinsically linked to coastal ecosystems discussed further in section 4. The world's estuarine and coastal ecosystems are experiencing a significant loss of species diversity due to human activity (Barbier *et al.*, 2011; Martínez *et al.*, 2006) reducing their ability to provide ecosystem services, which will be further accelerated through the impacts of climate change (Kopke and O'Mahony, 2011; Cooper, 2009; Costa *et al.*, 2009). Climate change can potentially alter the economic profile of a coastal region, as local businesses from various sectors (e.g. coastal and marine tourism, fisheries, and residential housing) will have to face a number of challenges, in particular sea level rise, recurrent and more dramatic storms, and flooding events. These have the potential to disrupt day to day business and living conditions in affected areas, and at significant financial cost (Kopke and O'Mahony, 2011; Cooper, 2009, Costa *et al.*, 2009). Cooper's third approach, land and property value is discussed below in sub-section 3.3.

Social

Some of the world's largest metropolitan areas are situated on coasts, and recent migration towards the coast has been remarkable (Martínez *et al.*, 2006; Curran and Agardy, 2004; Creel, 2003).

In the ESPON space⁴⁰, LAU2 units within commuting distance of the coast and contiguous to the coast have an average population density of 149 inhabitants per km², which is 44% higher than the average (103 inh./km²). The corresponding figure for EU27 is 186, which is 66% higher than the average (111 inh./km²). It is however notable that the area situated at more than 45 minutes and less than 90 minutes from the coast has a population density that is significantly lower than the average (80 inh./km² in ESPON Space and 91 inh./km² in the European Union. The coast is therefore an area with a contrasted settlement pattern where population generally concentrate close to the coastline (0 and Table 9).

⁴⁰ excluding Croatia, Turkey and the Former Yugoslav Republic of Macedonia

Table 8 Population densities in coastal areas and the inland in ESPON space¹

	ESPON space*				
	Area	Population 2001	Population 2006	Pop. Density 2001	Pop. Density 2006
45 minutes + contiguous	1 337 520	177 439 244	182 231 092	145	149
Between 45 and 90 minutes	757 832	56 324 614	60 564 608	74	80
90 minutes + contiguous	1 979 734	233 763 858	242 795 700	118	123
Other areas	3 059 739	260 589 873	276 213 956	85	90

Table 9 Population densities in coastal areas and the inland in the European Union

	EU27				
	Area	Population 2001	Population 2006	Pop. Density 2001	Pop. Density 2006
45 minutes + contiguous	954 840	173 387 976	177 289 920	182	186
Between 45 and 90 minutes	690 201	55 979 146	58 953 801	81	85
90 minutes + contiguous	1 645 042	229 367 122	236 243 721	139	144
Other areas	2 766 161	252 832 917	256 353 060	91	93

However, coastal population densities are unevenly spread: sparsely inhabited rural coastlines contrast with extremely high-density urban areas. A very high population density of over 200 km² is registered in the coastal zones of Malta, Belgium, Netherlands, United Kingdom, Portugal and Italy, while Northern Scandinavia and the Baltic have Europe's lowest coastal population densities (0).

Table 10 Population densities in coastal areas (LAU2 at less than 45 minutes from the coast or contiguous to the coast)

Code	Country	2001	2006
AL	Albania	-	211.4
BE	Belgium	487.6	496.4
BG	Bulgaria	154.6	154.7
CY	Cyprus	78.5	89.4
DE	Germany	204.1	206.0
DK	Denmark	124.7	143.4
EE	Estonia	57.1	55.8
ES	Spain	298.3	333.8
FI	Finland	53.8	55.2
FR	France	120.2	127.3
GR	Greece	115.8	119.3
HR	Croatia	84.4	-
IE	Ireland	86.1	94.3
IS	Iceland	3.4	3.6
IT	Italy	263.4	269.5
LT	Lithuania	98.8	91.4
LV	Latvia	84.9	82.6
ME	Montenegro	-	49.5
MT	Malta	1251.1	1283.8
NL	Netherlands	537.9	549.2
NO	Norway	21.0	21.6
PL	Poland	178.1	178.9
PT	Portugal	323.7	319.7
RO	Romania	112.1	117.1
SE	Sweden	55.3	56.9
SI	Slovenia	86.6	88.7
TR	Turkey	247.6	-
UK	United Kingdom	263.4	251.6

- : No data

Coasts are generally considered to be desirable places to live because of the scenic landscape and/or lifestyle (Fontaine and Rounsevell, 2009; Datzira-Masip and Julia-Eggert, 2008; Rodriguez, 2001). As property and land values in many coastal areas are inflated due to high population densities, a large proportion of the population, often less affluent younger generations, is excluded from living near the coast, often where they grew up (Gervais-Aguer, 2006; Bryden, 2000). This phenomenon is coupled with, and in some cases caused by, an influx of a generally older population “equipped with a decent purchasing power”, are willing and able to pay the increased prices (Gervais-Aguer, 2006). Ostend, Belgium, is an example of an area that has experienced an influx of older more affluent retirees (Delaney *et al.*, 2010). Retirees tend to move down the metropolitan hierarchy when migrating, i.e. from cities to smaller towns and villages (Longino and Bradley, 2003; Bryden, 2000). In 2007, 41% of people aged 65 and over resided in EU coastal regions. In almost 60% of EU coastal regions, the share of seniors is higher than the national average (Eurostat, 2010). Physical amenities, pleasant climate, scenic value and proximity to the sea are the most common determinants of such migration (Fontaine and Rounsevell, 2009; Rodriguez, 2001).

Rodriguez (2001) suggests that elderly people who reside for relatively long periods and repeatedly in the same holiday destinations are often looking for a more permanent residence. Datzira-Masip and Julia-Eggert (2008) find that, in Spain's Costa del Sol, the preference for retirement locations was based on comfort and previous experience.

Fuelled by increased wealth, an ageing society, better infrastructure and tax incentives, second home ownership in the coastal zone has substantially increased in recent years (Quinn, 2004). The consequences of such developments do not only shape the socio-economic fabric of a coastal region: so-called "ghost" estates both impact negatively on the lifestyle of the host communities and drastically alter the physical nature of the area. Many coastal regions in Europe have experienced a surge of housing construction in the last decade, but the problem is particularly acute on the coasts of Ireland, the Spanish Mediterranean and the French Atlantic (Datzira-Masip and Julia-Eggert, 2008; Gervais-Aguer, 2006; Quinn, 2004). In 2006, 28% of the total demand for residences in Spain was from holiday-makers, which was predicted to rise to over 50% by 2011. Datzira-Masip and Julia-Eggert (2008) suggest that this phenomenon is caused by a combination of relaxed planning laws, affordable accommodation and tax incentives. In Ireland, the construction boom of the now defunct 'Celtic Tiger' economy was unprecedented in the country's history, leading to a flood of holiday homes in large tracts of the coastal zone (Quinn, 2004).

Landing Points

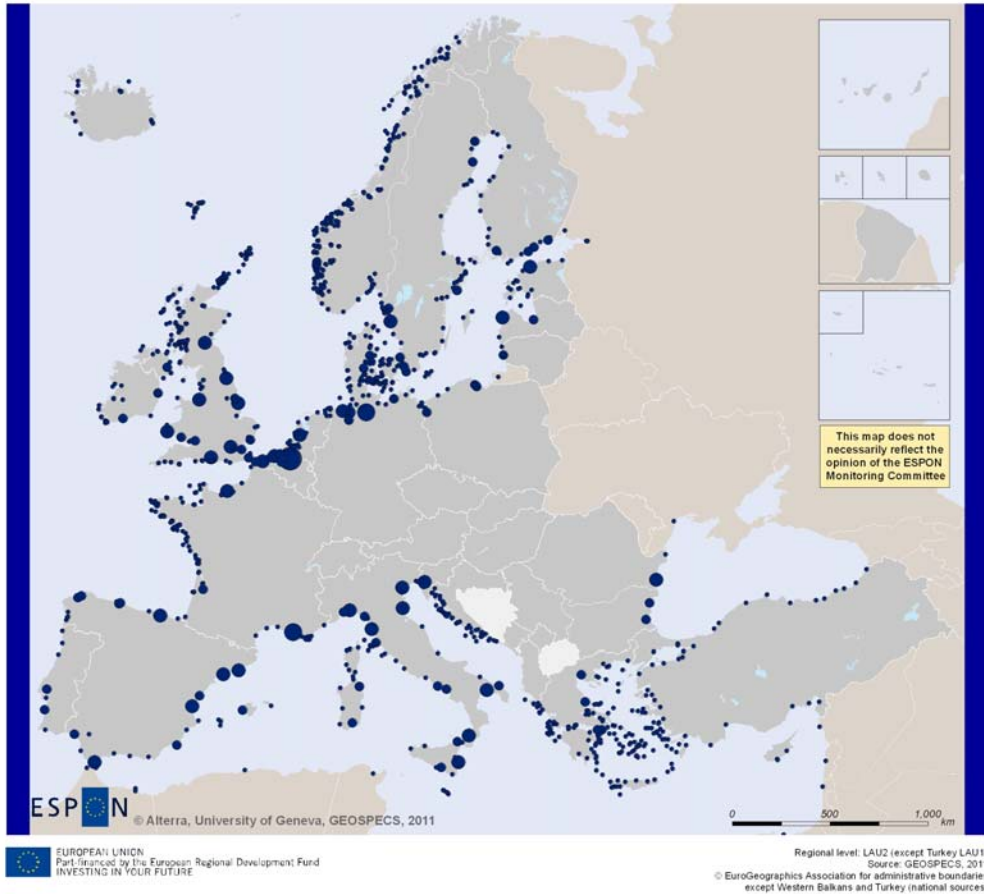
The notion of 'landing points' may be a useful geographic, social and economic descriptor in order to explore coastal specificities. Landing points, principally in the form of ports, are unique to coastal zones. Landing points or ports act as a 'hinge' for the interplay of social-economic indicators. In one sense, it can be argued that the basis of socio-economic activity in many coastal areas has been the development of ports. Evidence shows that access to the coast and open trade policies increase the per capita income in a country by more than 20% (Redding and Venables, 2004). In the UK, for example, the orientation of ports has a vital role for market access in determining the geography of trade (Behrens *et al.*, 2006). UK ports nearer continental Europe (e.g. Dover, Southampton, and Felixstowe) have a significantly greater level of trade activity than most other ports in the country. According to British Ports Industry⁴¹, 95% of Britain's trade is conducted through its ports and the

⁴¹ Source: <http://www.britishports.org.uk/uk-ports-industry/market-overview>.

value of goods passing through ports in 2006 was £340 billion. On a European level, trade through EU ports was valued at over €700 million in 2007 (Eurostat, 2009) (see Map 13).

Ports are the primary gateways for operations such as ferries, containers, oil, leisure, fishing, bulk goods and general cargo. The location of many petro-chemical and pharmaceutical industries coincides with sufficiently large and deep ports. Ports are central, not only to trade, but also to a range of other social and economic activities that have a marked influence on the structure of local employment, demography and social profile. For example, Eurostat (2010) finds that employment in the coastal zone is greatest where there are large urban centres, tourist hotspots or large harbour or port infrastructure. In 2007, 410 million people embarked or disembarked in EU coastal regions (Eurostat, 2010). However, as illustrated in Map 14, these flows of people are concentrated in a small number of regions, again reflecting the highly disparate socio-economic and physical nature of the coastal zone. 77% of marine passengers depart or arrive in only 9% of coastal regions. The coastal region of Attiki in Greece, for example, has the highest frequency of passengers in Europe, with 48 million people annually passing through its ports. The reasons for this are two-fold: first, Greece consists of numerous well-scattered islands and travel by sea is the most convenient means of transport; second, tourism is by far the largest industry in Greece, and 'island-hopping' is a very popular way for holiday-makers to see the country. In areas of short sea crossings, for example between Denmark and Sweden, and France and England, there are also significantly high numbers of people passing through its ports.

Ports have a powerful influence on the sociological structure of settlements because host a multitude of cultures and languages and, as such, influence the composition, outlook and philosophies of the settlements. Industry and populations have historically developed around ports, which also act as gateways to other, perhaps more exotic places, exposing a place to foreign influences, either through the transience of ship workers and transport hauliers, but also via economic migration – both inwards and outwards. Migration is much more prominent in the enlarged European Union, especially since the inclusion of many Eastern European states, which resulted in a large-scale east-west flow of workers (Kraus and Schwager, 2003).

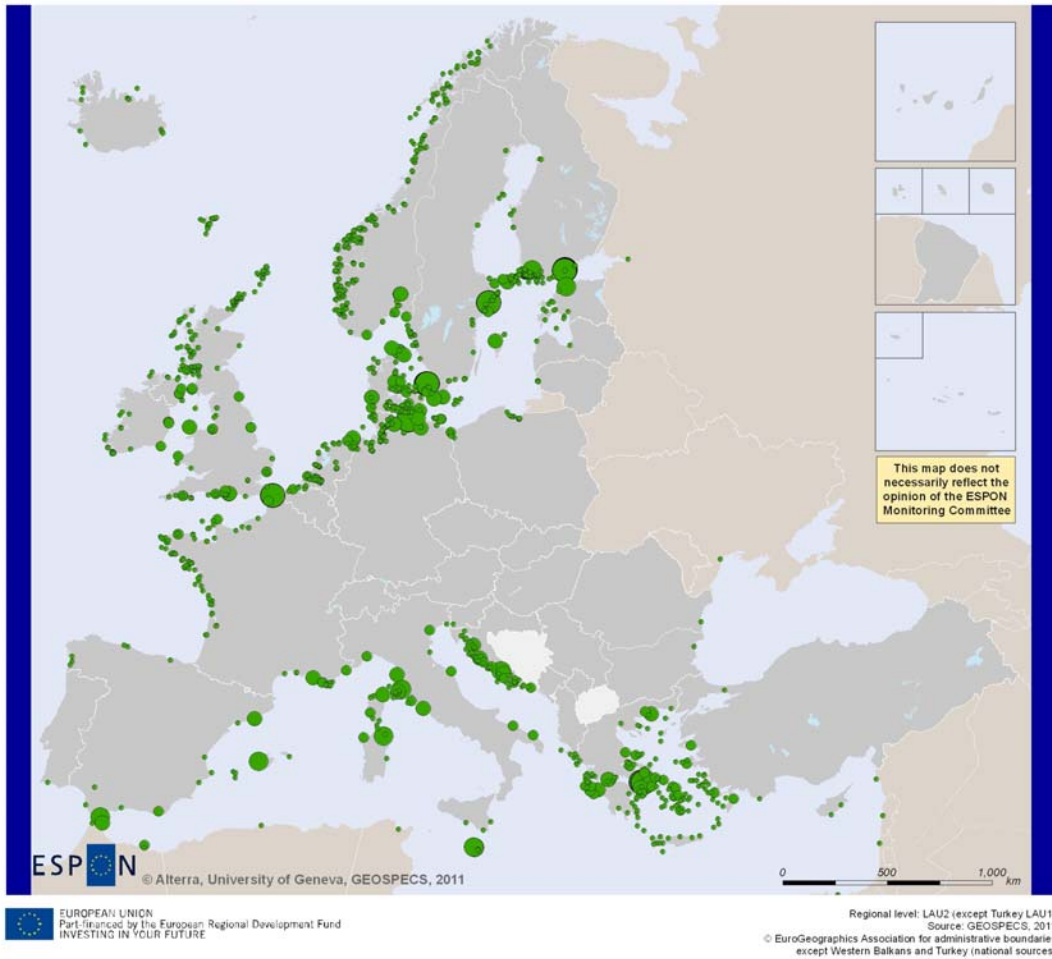


**Goods transported/ thousand tonnes
2007**

- < 7500
- 7501 - 27000
- 27001 - 74000
- 74001 - 165500
- 165501 - 374100

source: Eurostat

Map 13 Goods transported (inwards and outwards) in the EU coastal zone in 2007 (source: Eurostat)



Port Passengers/thousands

2007

- < 450
- 450 - 1500
- 1500 - 3200
- 3200 - 7000
- 7000 - 14400

source: Eurostat

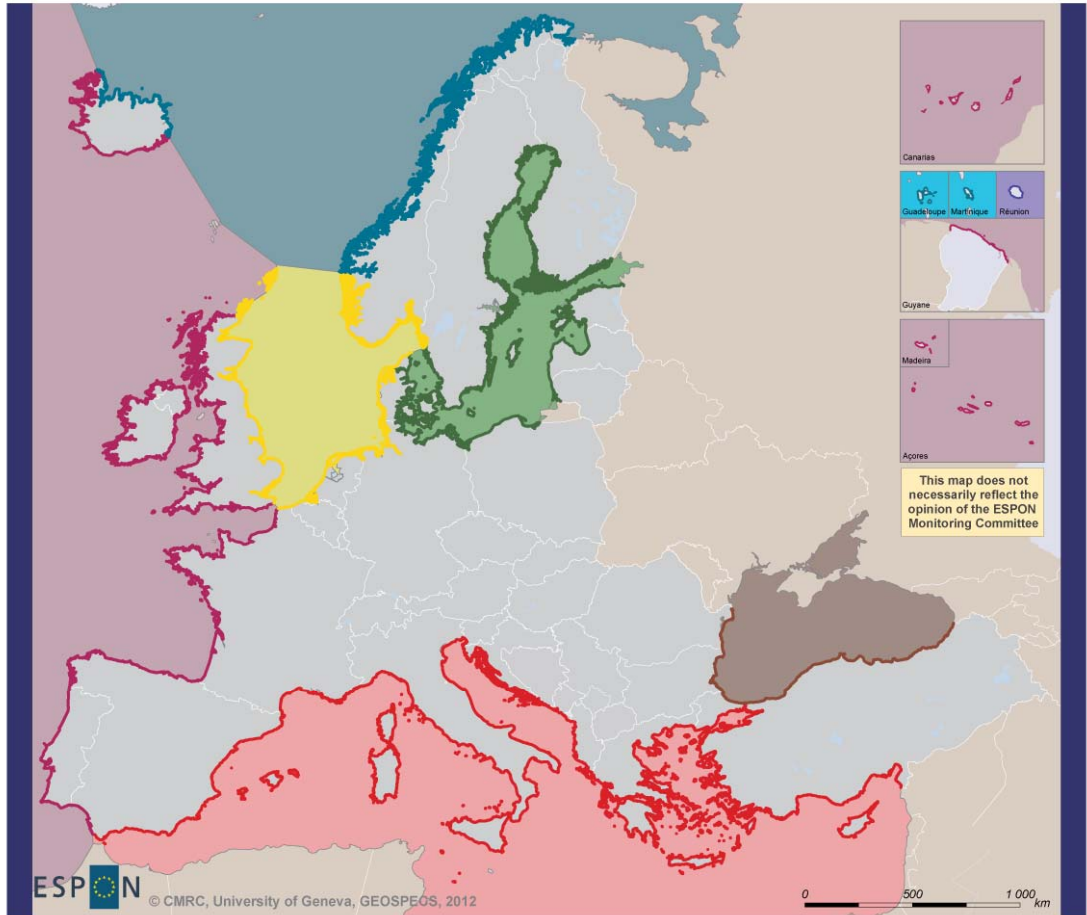
Map 14 Port passengers for the EU coastal zone in 2007

The physical/geographical concept of the coast

Europe's regional seas (e.g. the Mediterranean Sea, Baltic Sea, North Sea, Norwegian Sea, Greenland Sea and Black Sea) and its two oceans (Atlantic and Arctic) have diverse coasts in terms of their morphology, environments and ecology. They vary in climate and tidal regimes as well as being influenced by a diversity of socio-economic pressures. As part of the ESPON ESaTDOR project, Kidd *et al.* (2011) have outlined the general characteristics of these European seas in terms of their physical environments:

- The European Atlantic coasts range across a large geographical area, from Iceland to the southern tip of Spain, geomorphologically varying from heavy indentations to long stretches of sandy beach. Renewable energy (wave and wind) is being developed due to the availability of consistently westerly winds and substantial Atlantic swell.
- The Mediterranean coasts are dominated by micro-tidal regimes⁴² and long sandy beaches. Their high tourism concentrations and large-scale urbanisation result in environmental pressures: water shortages, inshore pollution and land degradation.
- The North Sea coasts have perhaps the largest variation in terms of physical environment. Areas devoid of human habitation, such as the north of Scotland and much of southwest Norway, stand in marked contrast to the large port regions of southeast England and the Dutch and Belgian coasts. Much of the North Sea coast is dominated by energy and transport infrastructure, with some of the largest wind farms and busiest shipping lanes in the world.
- In contrast, the northern coasts of the Arctic Ocean and Norwegian and Greenland Seas are extremely sparsely populated with low levels of urbanisation, while hosting some of the world's most fragile ecosystems. Climate change, which is more acute in the extreme latitudes, has the potential to drastically alter the region's ecology and morphology. The coasts of the Baltic and Black Seas suffer considerably from pollution in the form of eutrophication. Algal blooms are frequent, with major impacts on biodiversity. Both coasts are dominated by industry: in the Black Sea, by oil and gas transportation; in the Baltic Sea, by cargo traffic human activities that impact negatively on the abundance of marine species.

⁴² Source: www.euroSION.org/database/tidalregime



ESPON
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Source: GEOSPECS, 2011
 © EuroGeographics Association for administrative boundaries
 except Western Balkans and Turkey (national sources)

Seas and oceans	Corresponding coastlines	
 Atlantic Ocean		 ESPON space
 Baltic Sea		 Non-ESPON space
 Barents, Greenland and Norwegian Seas		 Coastlines, non ESPON space
 Black Sea		
 Caribbean Sea		
 Indian Ocean		
 Mediterranean Sea		
 North Sea		

Map 15 Main seas border ESPON space and corresponding coastlines

The socio-economic development opportunities of coastal areas are partly determined by the sea they are bordering. For some areas, such as around the straits of Kattegat, Gibraltar and the Bosphorus, the fact of bordering multiple seas creates specific preconditions.

Natural coastal features and habitats

The factors that influence the formation and maintenance of the natural physical coast and its habitats are primarily natural processes such as waves, storms, tides, river sedimentation, uplift and subsidence, offshore currents, ice, wind and sea level change. The development of physical coastal landforms and features represents equilibrium between wave energy and sediment supply, adjusting under the constant influence of erosion and sedimentation (Swift *et al.*, 2004). These cycles of multi-temporal re-shaping dominate almost every stretch of European coastline. However the rate of change is more conspicuous in softer, sediment-based coasts than hard, rocky shores and cliffs (Devoy 2008; French, 1997).

Globally, coastal habitats and ecosystems are shaped in one of the most dynamic environments, and among the richest and most productive ecosystems. They are, however, highly susceptible to physical impact caused by natural and human factors (Airoidi and Beck, 2007; French 1997; Williams, 1990). European coastal areas harbour many important habitats and species that are geographically specific to the coast e.g. habitats in the intertidal zone. This zone alone hosts as many as ten phyla⁴³ of the animal kingdom, representing over a quarter of all animal species (Mander *et al.*, 2007). Wetlands, also highly productive ecological areas specific to the coast, provide important wintering sites for waders and wildfowl, roosting and feeding grounds, moulting sites and migration staging areas (Mander *et al.*, 2007).

Coastal ecosystems and habitats provide important ecosystem services e.g. flood absorption, filtration and groundwater recharge. For example, wetlands and beaches can act as effective buffer zones against tidal inundation (Gault and McSweeney, 2006; French, 1997). Considering the potential future impacts of climate change on the coast (e.g. rising sea levels, increasing frequency of extreme weather events), these landforms provide extremely important services to people living and operating on the coast (Kopke and O'Mahony, 2011). Wave activity can be absorbed by halophytic vegetation and sediment; more than 50% of wave energy is dissipated within the first 2.5 metres of a salt marsh, and it is virtually eliminated at 30 metres (Williams, 1990). However, human activities such as land reclamation, coastal development, overfishing and pollution threaten Europe's coastal habitats by causing the loss of physical available area and species and habitat diversity. Such impacts are particularly

⁴³ Phyla (singular *phylum*) are taxonomic subdivisions of kingdoms, which group related species together according to body plan and internal organisation. There are 36 phyla of the kingdom *Animalia*

evident and acute in areas that have been historically centres of human activities (Airoldi and Beck, 2007). Furthermore, habitat and species loss will potentially be accelerated by the impacts of climate change, altering the natural European coastal land and seascape, which could negatively impact on coastal tourism (Kopke and O'Mahony, 2011; Cooper, 2009).

The European coast as a policy object

Coastal areas represent the sea/land interface, where many use interests overlap, creating environmental pressures (Cooper, 2009; Weinstein *et al.*, 2007; Cummins *et al.*, 2004). The ambiguous extent of its boundaries is specific to the coast, rendering any political and legislative analysis quite complex (O'Hagan *et al.*, 2005). The expression the 'environment knows no borders' immediately loses meaning because the concept of administrative areas and borders is central to policy and legislation. There are seven maritime areas in which coastal states can exercise jurisdiction: internal waters, archipelagic waters, territorial seas (TSs), contiguous zones, continental shelves (CSs), exclusive economic zones (EEZs) and fishery zones (Maes, 2008). The Regional Sea Conventions can have the EU Member States and non-Member States as signatories: Oslo-Paris (OSPAR) Convention for the North East Atlantic; Barcelona Convention for the Mediterranean (including a specific ICZM protocol); Helsinki Convention (HELCOM) for the Baltic Sea; and the Black Sea Convention. These regional programmes facilitate activities focused on thematic, often common, issues, e.g. environmental quality, but they can also contribute to efforts to enhance Cohesion Policy.

Policies affecting the coast are numerous and vary according to their purpose, with a large range of issues associated with the marine and coastal systems in Europe (Meiner, 2010). In many instances, EU law is supreme over the law of individual Member States (O'Hagan *et al.*, 2005; Skjærseth and Wettestad, 2002). In terms of legislation concerning the coast, this is advantageous as most Member States have no specific coastal legislation (O'Hagan *et al.*, 2005). For example, coastal planning law for the most part involves only the terrestrial aspect of the coastal zone. The following sections give an overview of policy instruments and legislation that are specifically relevant to the European coast.

Integrated Coastal Zone Management (ICZM)

The problems associated with constructing concepts of the coast are well illustrated with the EU Demonstration Programme on ICZM. Launched in 1996, it was the first serious investigation into coastal management on a

pan-European basis. Its central aim was to promote a holistic and cohesive approach to coastal zone management involving all stakeholders and administrators (Cummins *et al.*, 2004). Underpinning the Demonstration Programme's 35 projects were (i) knowledge and experience exchange, (ii) fostering dialogue between the European institutions and stakeholders of the coastal zone and (iii) leading to a consensus regarding the measures necessary in order to stimulate ICZM in Europe (EC, 1999).

In 2002, the European Commission adopted a Recommendation based on the experiences and outputs of the Demonstration Programme. While Member States did not fully implement ICZM into their national law based on those recommendations, for the success of ICZM in Europe requires more political support at EU and national levels (Gibson, 2003). O'Hagan *et al.* (2005) suggest that the sectoral nature of coastal activities coupled with the loose definition of the coast (which disregards administrative boundaries) both impede the management process. Nevertheless, the Recommendation is now perceived as an important instrument in delivering the EU's Integrated Maritime Policy (IMP) (Long, 2011). A constituent of IMP, Maritime Spatial Planning (MSP) is seen as a key instrument in achieving integrated coastal management (Douvere *et al.*, 2006; O'Hagan *et al.*, 2005).

The Water Framework (WFD) and Ecosystem-based management (EBM)

The Water Framework Directive (WFD) in 2000, while not exclusively focussing on marine or coastal waters, constituted a new view of water resources management in Europe (Borja, 2005). The WFD divides the European seas into six different eco-regions: Atlantic Ocean, Norwegian Sea, Barents Sea, North Sea, Baltic Sea, and Mediterranean Sea (including the Black Sea) (Commission of European Communities 2000). The Directive's purpose is to protect groundwater, inland surface waters, estuarine waters, and coastal waters, with ecosystems being at the centre of the management decisions. Borja (2005) argues that the WFD is likely to influence management of all marine ecosystems because pollutants that originate in inland water basins inevitably pass through the coastal zone to open waters. Furthermore, the WFD was one of the first attempts to view the coastal zone in the context of a wider ecosystem, i.e. water basins. This has a profound implication for the political and legislative concept of the coast.

The ecosystems approach has increasingly become important for addressing the management of human activities in the marine

environment (Long, 2011). The key principle is to manage human activities in a way that preserves the entire structure and function of an ecosystem to maintain its capacity to provide products and services (Long, 2011; Ehler and Douvère, 2009). The reformed Common Fisheries Policy, anticipated in 2013, aims to implement the EBM (Maes, 2008). EBM is directly related to the requirements of other legal-binding directives such as the WFD and the Marine Strategy Framework Directive.

The Integrated Maritime Policy (IMP) and the Marine Strategy Framework Directives (MSFD)

The publication of the Integrated Maritime Policy (IMP) in 2007 was a major milestone in EU policy; its main objective is to maximise sustainable use of the oceans and seas while enabling growth of the maritime economy and coastal regions (Long, 2011; Meiner, 2010). This requires cross border and cross-sectoral work, promoting the integration of governance structures in the Member States and building scientific knowledge on the status of the marine environment (Commission of European Communities, 2007). The environmental pillar of the IMP is the Marine Strategy Framework Directive (MSFD), adopted in June 2008. The ecosystem-based approach is a core feature of the MSFD, which requires EU Member States to achieve "Good Environmental Status (GES)" of marine waters by 2020, to protect the economic and social resource that is the marine environment (European Commission, 2008b).

Maritime Spatial Planning (MSP)

MSP, also mentioned in the IMP, is a means to implement a more collaborative and integrated decision-making process in order to secure the sustainable development of marine areas (Meiner, 2010). The main drivers for MSP in recent years have been the increased activity on Europe's seas and competition between sectoral interests, such as shipping and maritime transport, offshore energy, ports development, fisheries and aquaculture and environmental concerns. Among the key objectives of MSP are stakeholder participation, legal effect at the national level, cross-border cooperation and, perhaps most importantly, coherence between terrestrial and marine spatial planning (Ehler and Douvère, 2009; Maes, 2008). This last issue has the most bearing on the coastal zone. It represents a significant step forward in legislating for the coast's multi-sectoral, cross-geographical nature, and constitutes a large shift in the traditional concept of managing the coast (O'Hagan *et al.*, 2005). Coasts

will benefit the most from MSP because they have most to lose in the absence of coherent policy (Meiner, 2010).

Climate change and conservation

A range of policy instruments, agreements and legislation reiterate the wide range of issues that need to be addressed in the European coastal zone. The White Paper on adapting to climate change recognises the need to address potential impacts of climate change for Europe (Commission of European Communities, 2009a). The accompanying working document 'Climate Change and Water, Coasts and Marine Issues: an integrated approach' is specifically important for coasts as it addresses the requirements for increased resilience towards the potential impact of climate change within the coastal and marine environment, in relation to the human activities that taking place and depend on these environments (Commission of European Communities, 2009b).

At the EU level, the conservation of coastal and marine habitats is included within the Directives that also apply to terrestrial habitat and species protection (Directive 79/409/EEC and Directive 92/43/EEC). Both form the Natura 2000 network, which builds the foundation for Europe's nature conservation policy (Douve, and Ehler, 2008). However, on an international level, the Ramsar Convention for wetlands of international importance and OSPAR Marine Protected Areas (MPAs) are specifically geared towards the protection of these coastal and marine areas.

Delineating coastal zones in Europe

For statistical analysis and measurement, Eurostat uses the NUTS 3 level to define the coastal zone by (Eurostat, 2010). Eurostat (2010) defines EU coastal regions as "regions with a sea border, regions with more than half of its population within 50 km of the sea and Hamburg". Such an approach may be relevant from a governance perspective, as proximity and contiguity makes the coastal dimension relevant issue for territorial policy making. However, it creates problems as areas with a small population density where coastal regions that include large inland areas e.g., northern parts of Scandinavia. Other methods of delineating the coast are often employed for a specific purpose and are therefore varied: e.g., immediate land/sea boundary extending in metres in both directions (land/sea), or visual distance from the sea (Hynes and Farrelly, 2011).

When seeking to understand how proximity to the coast influences socio-economic structures, trends and development perspectives, it seems more relevant to consider the distance of individual communities (i.e. LAU2

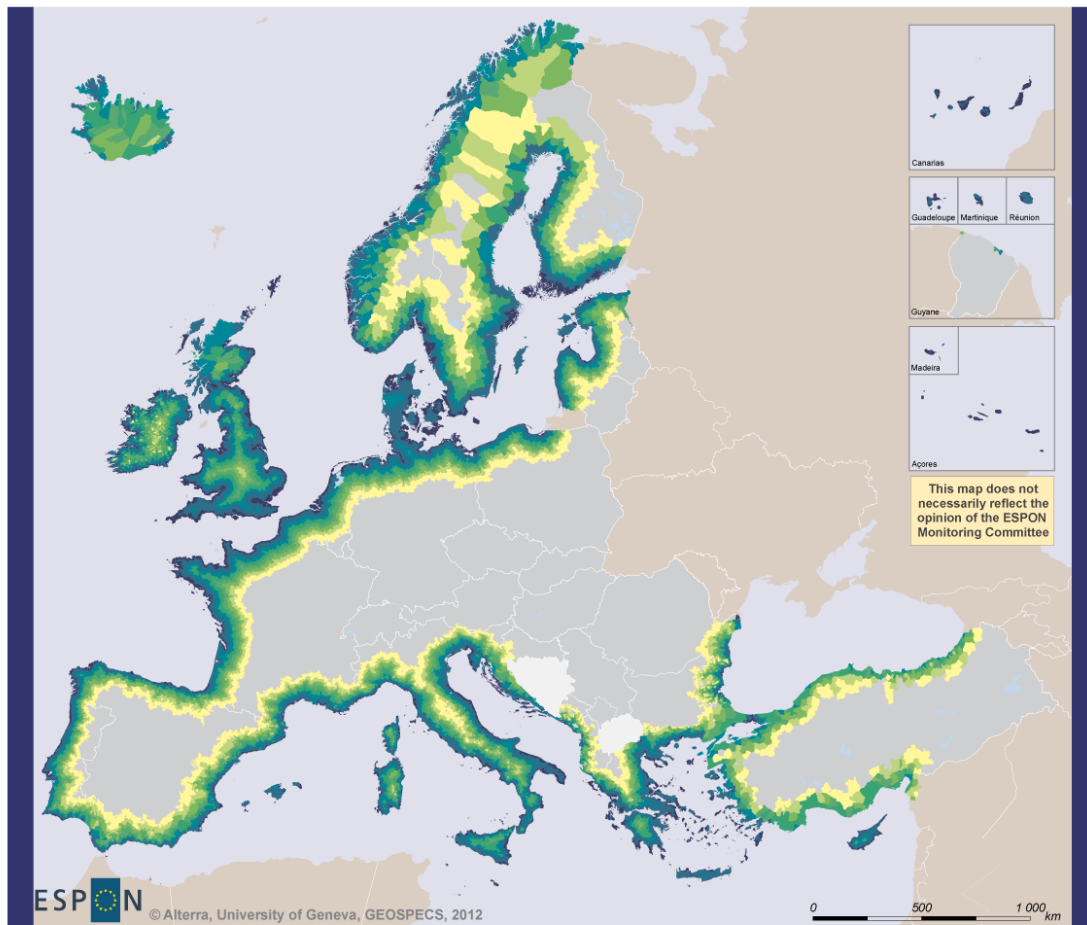
units) to the coast. One can also consider the specific effects of contiguity and of proximity to so-called “landing points” where resources from the sea or transiting through the sea arrive.

Therefore, GEOSPECS does not consider it meaningful to produce a fixed delineation of coastal zones. The objective is on the contrary to identify the various the ranges of mobility and interaction associated with the different types of coastal effects. Two of the hypotheses to be tested are whether areas within commuting distance to the sea (45 minutes by the road) and contiguous to the sea exhibit specific socio-economic patterns.

Time-distances to the coast are calculated in each LAU2 unit are based on the average of time-distance of 1x1 km grid cells within its boundaries. Some LAU2 that are particularly large or with a limited road network fall below time thresholds such as 45 minute in spite of being contiguous to the coast. When considering a coastal zone based on time distance, it appears purposeful to add these contiguous LAU2 units, as they have most of their settlements along the coast (see Map 15).

Time distances have also been calculated from each sea or ocean, so as to distinguish between coastal zones exposed to different types of marine influences and interactions with marine systems. For this purpose, the coastlines of the eight main Seas and Oceans of the ESPON space, including the outermost regions of the European Union, have been identified. Iceland, Norway, Sweden, the United Kingdom, France, Spain and Turkey have coastlines to multiple seas. The coastlines of the Shetlands and Orkneys have been assigned considered to be bordering the North Sea (see Map 16).

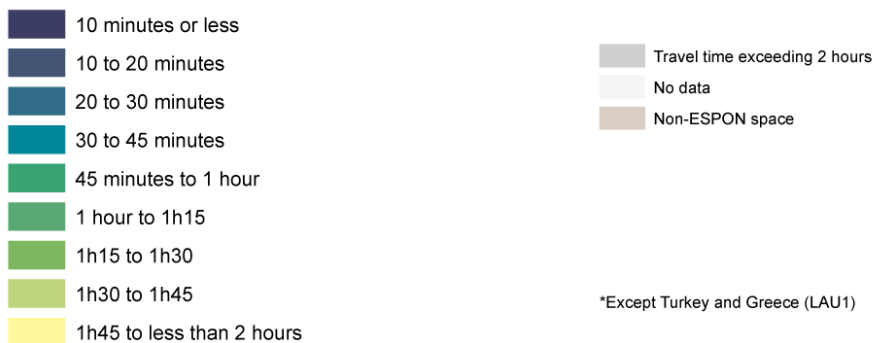
Travel time to the coast



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Regional level: LAU2 (except Turkey and Greece: LAU1)
Source: GEOSPECS, 2012
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except Western Balkans and Turkey (national sources)

Average travel time to the coast from LAU2 units*



Map 16 Average travel times to the coast from LAU2 units

GEOSPECS does not consider it meaningful to produce a fixed delineation of coastal zones. The objective is on the contrary to identify the various the ranges of mobility and interaction associated with the different types of coastal effects.

3.2.5 Border areas

Borders in Europe are the result of a long evolutionary process which is closely connected to modernist nation building, but the very nature of state borders is nowadays increasingly changing due to the parallel influence of the European integration process and of the on-going globalisation process.

The modernist nation-building process started throughout Europe with the Peace of Westphalia in 1648, which initiated a new political order in central Europe based upon the concept of sovereign states, and the subsequent establishment of the first absolutist monarchies during the 17th century. This process continued over the next three centuries. It created a new reality at the "edges" of these sovereign nation states (i.e. along their borders) which was completely different from the situation during the Middle Ages, where a more dynamic interpretation of territorial boundaries and the existence of neutral and also more permeable areas called "frontier zones" or "marchlands" generally prevailed.⁴⁴

The emerging and further evolving nation-states now defined their borders more statically (i.e. as a clearly defined & demarcated border line, often following physical obstacles such as mountain chains, rivers, larger lakes, maritime separations) and also attributed to them a major new political and economic function which made them less permeable for all sorts of exchange relations. The main elements of this new function were the establishment of national codes of law; the streamlining and centralisation of the state's administrative apparatus; the establishment of a national economic policy, a national fiscal and monetary system (i.e. taxation & single currency), and a protectionist trade policy (through the introduction of trade barriers); and the creation of a unified national transport and communication system. These developments generated a considerable number of new border effects throughout Europe, often reinforcing the barrier effects caused by physical obstacles, which also penalised the areas situated along those national borders in a number of ways (see: Annex 3).

This European nation-building process and the re-shaping of state borders continued until very recently, as a result both of peaceful secessions or reunifications⁴⁵ and of violent secessions involving military clashes among

⁴⁴ **Bottin, M. (1996):** *La frontière de l'Etat. Approche historique et juridique.* In: Sciences de la Société, no. 37 / février 1996. **Mancebo, F. (2001):** *Discontinuités, lisières et territoires. Tentative de généralisation de la notion de frontière et de compréhension des dynamiques frontalières.* Manuscrit auteur, publié dans « Sud-Ouest Européen », 10 (2001) p. 77-87".

⁴⁵ e.g. in 1990 the former German Democratic Republic (GDR) joined the Federal Republic of Germany; in 1991 the former Union of Soviet Socialist Republics (USSR) was formally

different ethnic and religious groups (i.e. the dissolution of former Yugoslavia during the 1990s and the emergence of several new nation-states).

Since the Second World War, the previously static and rigid functions of the classical nation-state borders and many of the associated obstacles have started to change over ever larger parts of the continent due to **the influence of the European integration process**. This first began in Western Europe with the creation of the Council of Europe (in 1949) and the European Communities (in 1951 & 1958). The latter, in particular, then slowly expanded over the following decades (1960s & 1970s) and was significantly widened and deepened from the mid-1980s. Several closely interconnected developments have changed and continue to substantially change the nature of borders in Europe.

Since the late 1980s and during the 1990s, the further deepening of the EU integration process⁴⁶ dismantled many economic, social, political-regulatory and also monetary border obstacles along the old internal borders of the EU12 and, after the enlargement in 1996, also along the internal EU15 borders. This has led to the "re-introduction" of prevalently dynamic and open borders, which generated new economic development dynamics perspectives within the EU15 and also stimulated the emergence of a new territorial dynamism and alternative patterns of spatial integration.⁴⁷ Moreover, continuing obstacles and barriers along the internal and external EU borders were more proactively tackled by newly introduced EU-level policy initiatives (especially since the launch of the INTERREG Community Initiative in 1990).

With the successive Eastern enlargement of the EU (in 2004 & 2007), which became possible after the fall of the "Iron Curtain" (beginning of the 1990s) and the subsequent economic transition and democratic development in Central and Eastern European Countries, the new Member States were "melted" into the Single European Market Economy and the wider EU integration process. This further increased the Union's cultural diversity and internal socio-economic disparities, but also created new opportunities for exchanges, investments and co-operation. This changed

dissolved, leaving all fifteen republics of the Soviet Union as independent sovereign states; in 1993 the former Czechoslovakia was peacefully dissolved and formally separated into two completely independent countries: the Czech Republic and the Slovak Republic.

⁴⁶ i.e. through the successive implementation of the Schengen Agreement (since 1985) and of the Single European Market legislation (since 1987), the establishment of the European Union (in 1993) and the creation of the Euro-Zone (in 1999).

⁴⁷ Traditionally, the most common patterns of spatial integration are local, regional and national. More recently, alternative options in terms of cross-border, transnational and inter-regional co-operation are intensively pursued as a response which is well-adapted to the dynamic change of the nature of borders in Europe.

the situation along the new internal EU borders, which *became more porous, permitting and encouraging more investment capital, consumer goods, services of all kinds, and, most dramatically, newly-minted EU citizens to pass relatively unimpeded from one country to another.*⁴⁸ Much of the Western European capital rushing into Central Europe focused on the western border areas of Poland, Slovakia and the Czech Republic, where more amenable tax regimes and lower wages/labour cost invited investment by outsourcing industries, ranging from major companies to small businesses.⁴⁹ Although seasonal and temporary labour could also move more freely from East to West, the degree of real border openness remained, and still remains, limited for permanent labour migration or cross-border commuting.

In a Pan-European perspective, the EU enlargements and the further evolution of the integration process considerably redefined the geopolitical landscape and the nature of many external EU borders (i.e. substantially increased overall length⁵⁰ & new positioning of the eastern external EU borders). This also brought to the surface a new “mentality map” redefining the notion of vicinity and neighbourhood which also (...) *is associated with new contradictions and divisions that create or redefine the perceptions and images of “us” and “others”.*⁵¹ One specific new division which becomes visible especially in the East of the EU is that many state borders now functioning as new external EU borders became less permeable than in the pre-integration period. A first, more general, aspect explaining this development is that the Single Market freedoms and other advantages granted by the EU or the Schengen regime end at most of the external EU borders, with many implications for the economic and social exchange relations across these borders. The second aspect is the fact that most of the external EU borders now take over for the whole of the Union the “old” function of a rigid demarcation line which previously existed between the individual states.

These new border dynamics created by the European integration process are superposed by **the ongoing process of globalisation**, which characterises our post-modern era and increasingly integrates national/regional economies, societies and cultures in a world-wide

⁴⁸ **Williams, E. / van der Velde, M. (2005):** *Borders for a New Europe: Between History and New Challenges.* In: Journal of Borderlands Studies, Volume 20, No. 2, Fall 2005.

⁴⁹ **ibid.**

⁵⁰ Since the last enlargement in 2007, the European Union has slightly more than 13,000 km of external land borders with 19 different neighbouring non-EU countries. The shortest external EU-land borders are those with Gibraltar (1.2 km) and with the Vatican City (3.2 km), while the longest are those with Norway (2,348 km) and Russia (2,257 km).

⁵¹ **Topaloglou, L./Kallioras, D./Manetos, P. /George Petrakos, G. (2005):** *A Border Regions Typology in the Enlarged European Union.* In: Journal of Borderlands Studies, Volume 20, No. 2, Fall 2005.

network of political ideas, communication, transportation and trade. Although it is often argued that globalisation would generally lead to a less static nature or even a slow disappearance of existing borders, this assumption needs to be carefully re-examined for both the economic and the socio-cultural dimension of globalisation (see: Annex 4).

The above-mentioned political and societal macro-processes help indeed to better understand the historical roots and also the changing nature of European borders, but they cannot explain how and to what extent a border tends to affect the socio-economic development dynamics of areas which are located in the immediate proximity. Due to this, we now develop an analytical concept which will allow us to adequately appraise "borders" and the associated "border effects".

The multidimensional reality of "borders"

GEOSPECS considers that borders are in fact a multidimensional reality. This reality comprises simultaneously features which are directly associated with the polity- and policy-dimension of a border, but also a number of other features which are related to the particular physical/geographical, economic and socio-cultural circumstances prevailing along a given border. In order to analyse this multidimensionality within GEOSPECS, five different concepts are used which address each a particular feature of this reality (see: Annex 5).

The polity- and policy-dimension of a border is addressed by two concepts which are both line-focussed and also closely inter-connected. The most established and long-standing is the concept of **political land borders**, which needs, for a maritime nation, to be supplemented by the concept of **maritime boundaries**. The latter show similarities to the political land borders, but the concept is relatively new because it was put into practice only in the 20th century through multilateral international conventions and treaties.⁵²

The overall physical/geographical, economic and socio-cultural context settings prevailing along a given border are indeed strongly conditioned through domestic policy action on either side, but the overall results of this action also generate cross-border implications which can affect the socio-economic dynamics of areas being more or less distant from the political border line. Due to this, three additional concepts are used by GEOSPECS which consider such cross-border implications: the first relates

⁵² See for example: **Charney, J. I./Alexander, L.M. (eds.) (1996):** *International Maritime Boundaries*. Dordrecht, the Netherlands, 1993 and 1996.

to **natural obstacles**, the second to **economic discontinuities** and the third to **socio-cultural lines of division**.

In the following, these five concepts are now applied for briefly highlighting the main features which currently characterise the internal and external EU-borders.

Political land borders in the EU

Since World War II, the nature of many traditional political land borders in Europe has become more differentiated and more complex, due to the various European processes of intergovernmental co-operation and supranational integration (e.g. Council of Europe, European Union, Schengen Agreement, European Free Trade Association, European Economic Area, EU Customs Union, Euro-zone, agreements with the EU to mint Euros).

These integration processes eliminated neither the involved nation states, as such, nor their politically defined border lines. Instead, these processes established new "international political borders" which follow the existing national borders and create multiple overlaps of different border-statuses that affect both the internal and external EU borders (see: Annex 6 and Map 17). Those variable statuses also have concrete legal implications, because these new international political borders delineate - similarly to the traditional national political borders - the sphere of application of more general political principles⁵³ and established supranational legislation or rules⁵⁴, as well as of the use of new symbols representing an emerging supranational sovereignty⁵⁵.

Under this influence, the internal EU borders have indeed become more open for economic and interpersonal exchange relations and are now only partially, or often even completely, unguarded (especially borders within the Schengen Area⁵⁶). At the external EU borders, however, intergovernmental co-operation and the supranational regulations of the EU established a new political dividing line in recent decades. This also creates a stronger division between the notion of "us" and "them" which often ignores individual, social, historical, political or economic

⁵³ e.g. legal standards for democratic development & human rights enforced by Council of Europe; European Union citizenship etc.

⁵⁴ e.g. EU-legislation, Schengen-rules, EFTA-rules, EEA-legislation & rules.

⁵⁵ e.g. since 1985/86 use of the EU flag as the official symbol; since 2002 de-jure use of the Euro as the official currency of the Euro-Zone & de-facto use of the Euro by other countries.

⁵⁶ Today, the Schengen area extends along nearly 8,000 km of external land borders and nearly 43,000 km of external sea borders as well as hundreds of border crossing points.

circumstances⁵⁷ and has led in some cases to a further decrease in border permeability if compared to the pre-integration period (especially the eastern external EU borders). The most important drivers behind this process are mainly the increased "securitisation" of external EU borders and border crossing points, as well as the establishment of an externalised and internationalised regime of "shadow borders" which created new functional barriers affecting the free movement of people between Schengen and non-Schengen countries and, in particular, refugees and asylum seekers (see: Annex 7).⁵⁸

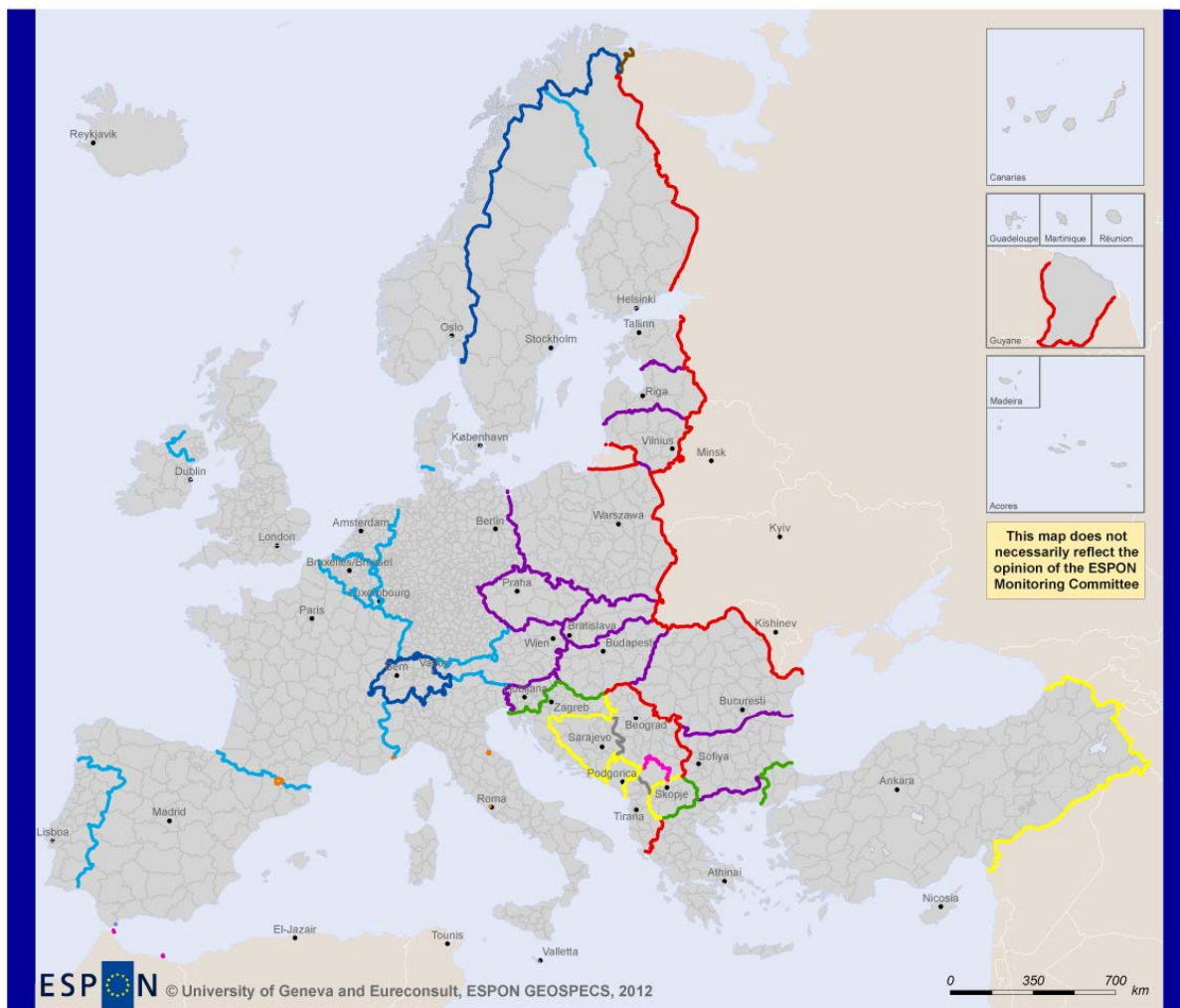
Disputes about the location of a political border continue to exist in some parts of the EU, despite its success in forming a bloc of peaceful and co-operating nations.⁵⁹ A few disputes can be found in the Baltic Sea area (e.g. diverging views on land border changes between Estonia / Russia and the role of the Tartu Peace Treaty of 1920), but most are in the southern part of the EU and involve either only EU Member States or EU Member States and non-EU countries.⁶⁰

⁵⁷ **Topaloglou, L./Kallioras, D. /Venieris, S. (2009):** [*Tracing the Determinants of Economic Cross-Border Interaction in the European Union*](#), *Spatium*, 21 (1), p. 4.

⁵⁸ See also the "internal working paper" elaborated for the GEOSPECS border group: **Roters, J. (2011):** *The EU external border regime*. Dresden (Leibniz-Institut für ökologische Raumentwicklung), October 2011.

⁵⁹ **Stetter, S. (2006):** Border Conflicts in Europe. Available at: www.uni-bielefeld.de/Universitaet/Einrichtungen/Pressestelle/dokumente/BI_research/29_2006/Forschungsmagazin_1_06_Grenzkonflikte_76_80.pdf

⁶⁰ e.g. Spain-Portugal on Olivenza including the municipality of Táliga; Spain-UK on Gibraltar and the Isthmus between Gibraltar and Spain; Spain-Andorra on an area near Montalmus peak; Italy-France on the border at the Mont Blanc, UK-Cyprus on a part of Dhekelia Sovereign Base Area.



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Classification of national land borders

Internal EU borders

- From before the enlargements of 2004 and 2007
- Since the enlargements of 2004 and 2007.

- ESPON area
- Other countries

External EU borders

- External EU borders to candidate country
- Disputed external EU borders (Ceuta and Melilla)
- External EU borders to EFTA countries
- External EU borders to microstates
- Other external EU borders

Other borders in ESPON space

- Border of candidate country to non-EU countries
- Border of an EFTA country to non-EU countries (Norway-Russia)
- Other disputed border in ESPON space
- Other borders in ESPON space
- Disputed border of a European territory with special status (Gibraltar)

Map 17 Classification of national land borders in the ESPON space

Maritime boundaries of the EU

The EU is surrounded by four seas (i.e. the Mediterranean, the Baltic, the North and the Black Sea) and one Ocean (i.e. the Atlantic) and the length of its coastline is estimated to be 136,106 km. Among the 22 Member States with a sea border, the EU countries having by far the longest coastlines are Sweden, the UK, Finland and Greece.⁶¹

The maritime boundaries of the EU are established through international conventions listing the coordinates of points being the vertices of segments which, in turn, define bi- or multi-lateral maritime boundaries (e.g. in the North Sea). These limits of maritime boundaries create concentric areas and zones surrounding coastal and feature baselines on which a nation claims sovereignty and exclusive rights or control over the mineral and biological resources. In the case of the EU, these areas and zones are usually the "coastal waters", the "territorial sea", the "contiguous zone", the "Exclusive Economic Zone" and also some fishing areas.⁶²

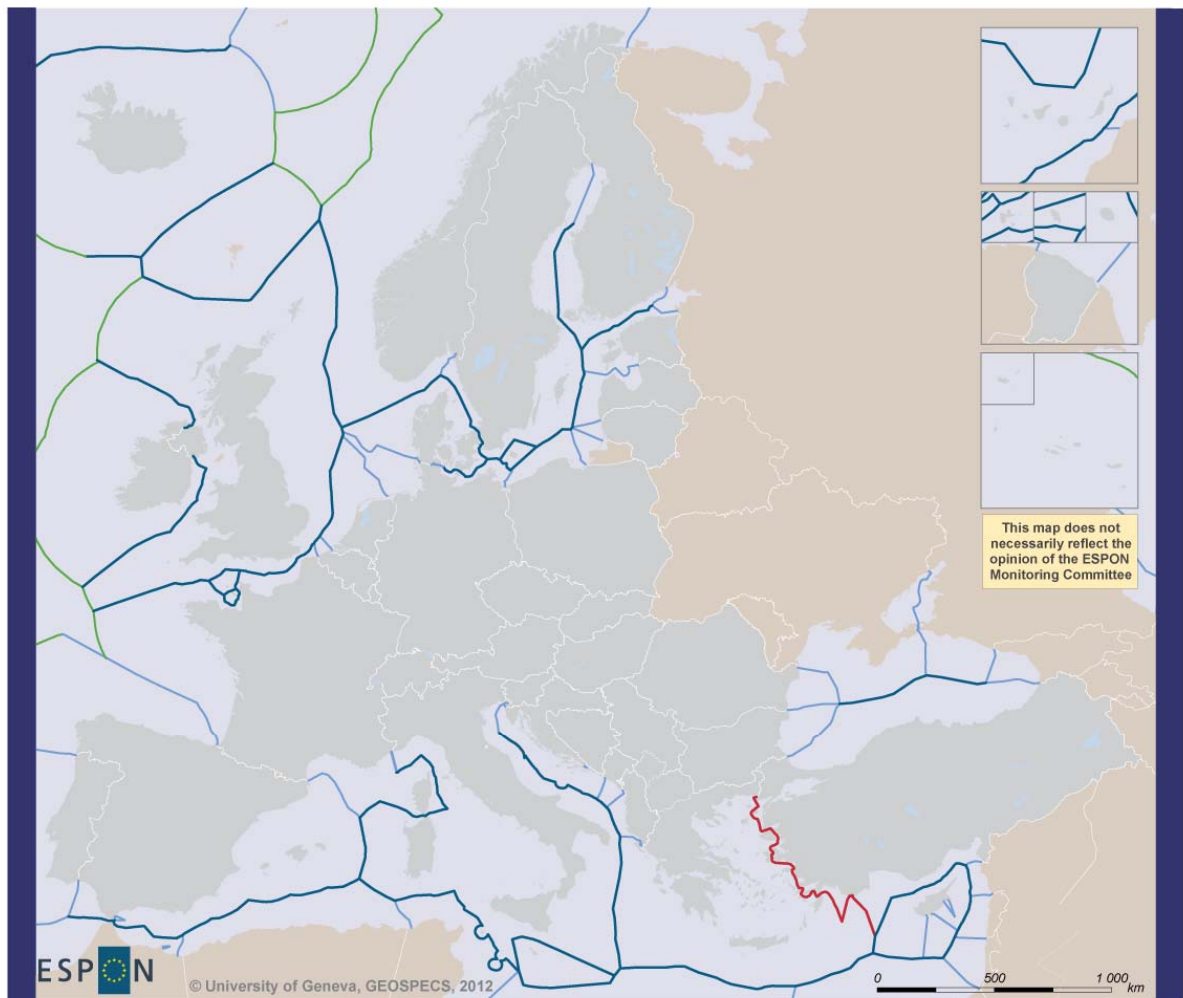
Disputes over the location of maritime boundaries continue to exist in Europe, as some have remained indeterminate despite efforts to clarify them. This can be explained by an array of factors, some of which also illustrate persisting regional problems. Such disputes generally involve states which formally recognise each other and exist either between EU Member States or between EU Member states and non-EU countries.⁶³

Map 18 shows different types of maritime boundaries in the surrounding seas of the EU as well as the sea around Iceland (i.e. restrictions exist for those cases where no regulatory text exists within the UNCLOS until now).

⁶¹ Eurostat (2009): Agriculture and fisheries. Statistics in focus 47/2009.

⁶² <http://www.eea.europa.eu/data-and-maps/data/maritime-boundaries>







⁶³ e.g. Greece-Turkey delimitation disputes in the Aegean Sea about territorial waters and exclusive economic zones including the Imia/Kardak dispute; UK-Spain dispute over British claimed territorial waters at Gibraltar; UK-Ireland-Denmark-Iceland dispute on Rockall; Denmark-Poland dispute on the [Baltic Sea](#) boundary near [Bornholm](#); Slovenia-Croatia dispute on the Bay of Piran,




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Regional level: NUTS 0
 Maritime boundaries: VLIZ (2011). Maritime Boundaries Geodatabase, version 6,
 available online at <http://www.vliz.be/vmcddata/marbound>
 © EuroGeographics Association for terrestrial administrative boundaries

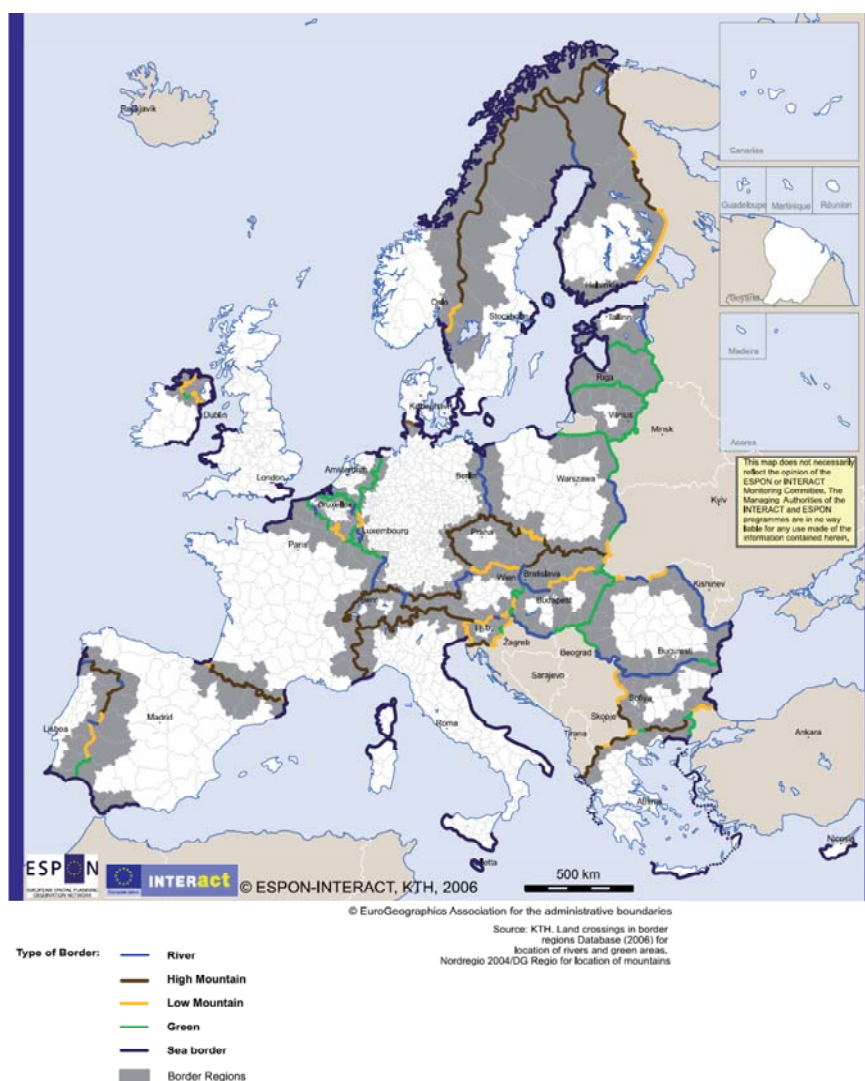
Types of maritime boundaries

-  National maritime boundary between territories without a significant land connection
 -  Major disputed maritime boundary
 -  Maritime boundary between territories with a land connection
 -  200 nautical mile limit
-  ESPON Space
 -  Non-ESPON space

Map 18 Maritime boundaries of the EU

Natural obstacles along the borders of the EU

Natural obstacles exist along most of the political borders in the EU (see Map 19). They are constituted by oceans and seas, high or low mountain ranges, larger rivers and lakes or even denser forests and jungles (e.g. French Guyana). The share of EU borders along which these physical obstacles do not exist (i.e. the "green borders") is relatively low.



Map 19 Types of natural obstacles existing along EU-borders⁶⁴

⁶⁴ **ESPON-INTERACT (2007):** *Cross-border co-operation – Cross-Thematic Study of INTERREG and ESPON activities*. KTH - Royal Institute of Technology, Stockholm. Esch-sur-Alzette and Viborg: ESPON Coordination Unit and INTERACT Point Qualification & Transfer. The study examined the main geographic features between NUTS3 land regions as well as the sea borders of cross-border regions based on INTERREG IIIA programmes and established different types of natural borders. River borders were constructed if a border of a NUTS3 region consists primarily of a river or lake. Mountain border regions are those NUTS3 regions with a border composed of high mountains (more than 45%) or of low mountains (less than 45%), whereas "green borders" are those where there are neither water bodies nor mountains composing the border (plain region).

Over the decades, however, the significance of the “barrier effect” represented by such natural obstacles for transport and communication was considerably reduced through major infrastructure works, the establishment of new transport services, or technological advances.⁶⁵ Yet, quite considerable variations in the availability and density of border-river crossings and rail / road border crossing possibilities remain within the EU. This also continues to generate different burdens for individuals and commercial actors to reach the other side of a given obstacle (i.e. variable travel time & cost needed to overcome similar distances).

Economic discontinuities along EU borders

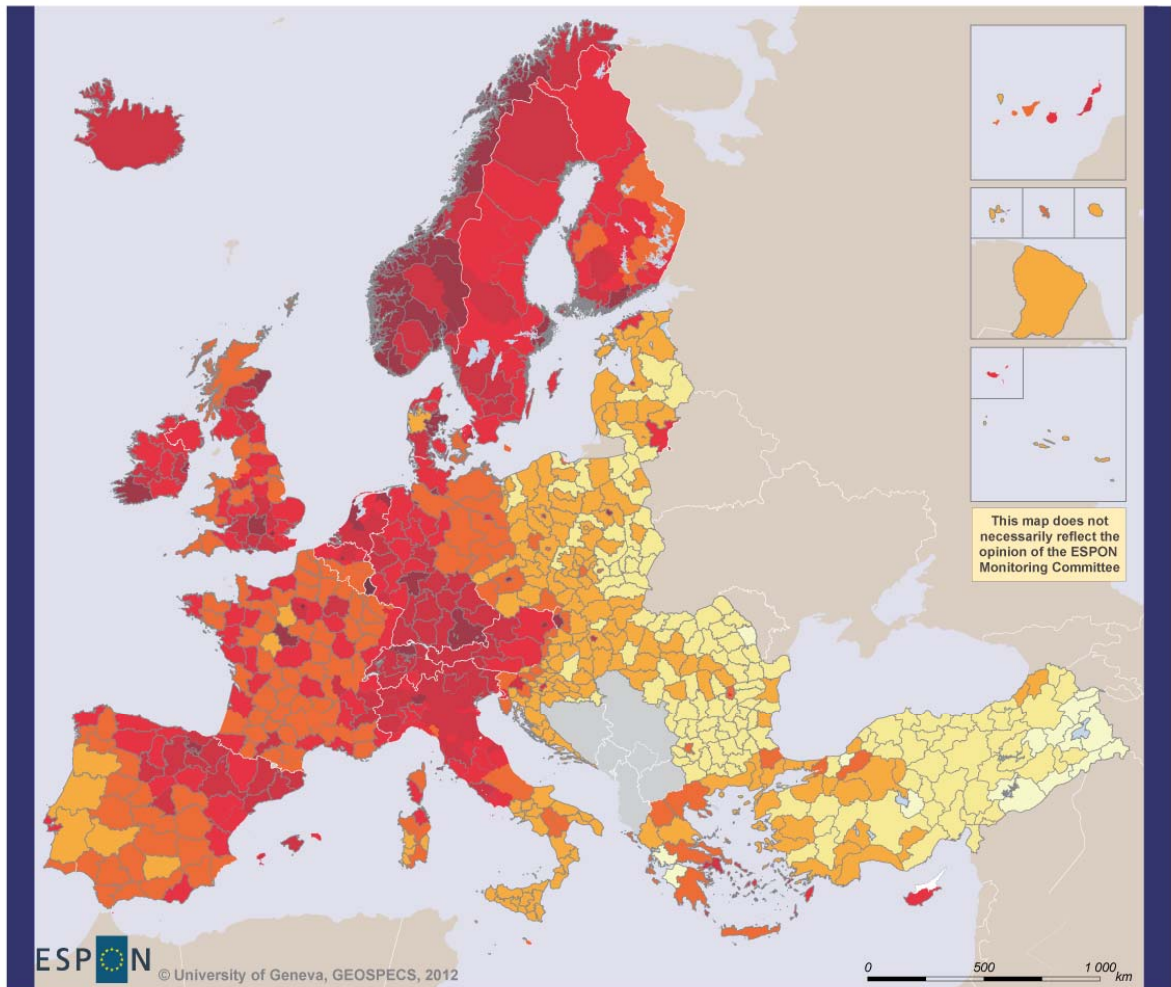
Economic discontinuities along EU borders are constituted by significant differences which exist between neighbouring border areas with respect to their respective overall economic performance (e.g. GDP/per capita, employment or unemployment etc) or in relation to more specific aspects which are of particular economic relevance (e.g. levels of taxation and wages, level of labour productivity or of regional R&D/innovation capacity). Significant differences normally act at the same time as “push factors” and “pull factors”, which then generate a wide range of both desirable and undesirable developments in border-regional and cross-border contexts.

The indicator “GDP (PPP) per capita” is an example which illustrates such differences along EU-borders. A mapping of the 2007 levels (see Map 20) shows that significant differences within the EU exist most often in a domestic context, but there are also considerable variations along several internal and external EU borders. The latter holds true for considerable parts of the land borders of France (Spain, Switzerland, Germany, Luxembourg, Belgium) and Belgium (with Luxembourg and France); for some eastern borders of Germany (especially with the Czech Republic, but also with Poland); for parts of the eastern borders of Austria (especially with the Czech Republic, Hungary and Slovenia) and of Italy (with Slovenia); for parts of the Greek border with Bulgaria; for parts of the Lithuanian border with Belarus; and especially for the borders of Finland with Russia.

Additional maps produced by GEOSPECS (see: Annex 8) show very clearly that significant differences between neighbouring border areas also exist

⁶⁵ e.g. the building of tunnels under mountain ranges or maritime separations; the building of bridges or major fixed links across larger rivers and maritime separations, the establishment of more ferry services, high-speed train connections or short and long-distance flight connections, through modern communication techniques and esp. the internet etc.

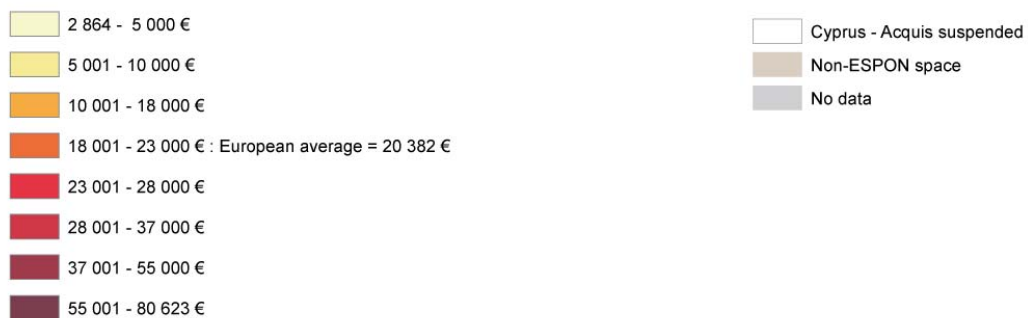
Gross regional product per capita in PPP



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Regional level: NUTS 2/3
Source: Aire, UMS RIATE
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except Western Balkans and Turkey (national sources)

Gross regional product in purchasing power parity at the NUTS2/3-level (2007)



Map 20 Gross domestic product (purchasing power parity) per capita, 2007

with respect to many other general or specific economic features.⁶⁶ These maps reveal that high “economic discontinuities” can be found along both the internal and external EU borders, which also supports the conclusion that no clear-cut overall geographical pattern prevails in this respect (i.e. polarisation between East-West and North-South of the EU or between “old” and “new” Member States).

Socio-cultural dividing lines along EU borders⁶⁷

Before reflecting about the existence of socio-cultural dividing lines along EU borders, we need to clarify our own position with respect to the notion of European culture. Some views claim that European culture is represented by its diversity which - as a positive asset - forms part of a “common cultural heritage” and can even be the cornerstone for establishing a “European identity” based upon a common history of the European states and the continent as well as values common to Europeans which have arisen out of pan-European civilisations and belief-systems (i.e. Christianity, the Greco-Latin political system, the Renaissance etc.). Other views consider European culture as a series of overlapping cultures which created and still creates a great variety of dividing lines across the continent that become most visible at the boundaries of culturally diverging macro-zones⁶⁸, at the borders of countries, or even at borders between individual regions. In our further analysis we consider both of these views relevant, for the following reasons.

Over the past decades, **many aspects of European culture have increasingly lost much of their demarcation effect.** This mainly results from the long-lasting process of secularisation (e.g. for religion⁶⁹) and more recent globalisation (e.g. for arts, science, philosophy, cuisines, clothing, sports). However, it also derives from a variety of structured societal processes which promote reconciliation (especially regarding

⁶⁶ e.g. proportion of employed population; female & male vulnerable employment; household final consumption expenditure per capita; low income situation; pump prices for petrol

⁶⁷ See also the “internal working paper” elaborated for the GEOSPECS border group: **Roters, J. (2011): *Multilingual borderlands in Europe*.** Dresden (Leibniz-Institut für ökologische Raumentwicklung), September 2011.

⁶⁸ e.g. northern cultures as opposed to southern cultures; western cultures as opposed to eastern cultures; Christianity as opposed to [Islam](#); [Protestant](#) Christianity as opposed to [Catholic](#) or Orthodox Christianity etc

⁶⁹ This mostly applies to Protestant and Catholic Christianity, but less to Orthodox Christianity (raise in importance in many countries belonging to the Eastern Block) and even lesser to Islamic beliefs (i.e. the upcoming of radical tendencies in Sunna & Shia Islam).

negative memories relating to past military conflicts), peaceful understanding among different nations or inter-cultural dialogues, and direct exchanges among people. As a consequence, one can realistically assume for these aspects that a level of common understanding (or "commonality") is now sufficiently well-developed, especially among the post-war generations, which helps to overcome previously existing dividing lines.

Such a loss of influence is, however, much less evident in the cases of belonging to a specific ethnic group or community (see: Annex 9) and also of belonging to a particular linguistic group. In the past and also in the present, one can observe that both aspects are frequently "instrumentalised" for the wider purpose of nation-building (e.g. affiliation of state-external population groups to the own population for politically supporting territorial claims vis-à-vis a neighbouring state; denial of regional differences and/or of ethnic minorities within a country as well as a state-propagated use of only one official language for establishing a national identity etc)⁷⁰ and that they also create still strong lines of socio-cultural division at the limits of many European states. These lines of division can generate many practical or "mental" obstacles which hamper - directly or indirectly - all sorts of individual and collective exchanges between neighbouring border areas.

Potentially existing socio-cultural dividing lines could, for example, be identified through **a mapping of the languages spoken in Europe**. Several tentative mapping approaches (see: 108) show at least that the linguistic situation in Europe is in territorial terms by far more complex than would suggest a simple mapping of only the official majority languages spoken in the different countries. This territorial complexity is also present along the various EU-borders, where the overall situation can be characterised by the following three main features.

First, "linguistic overlapping" exists along many internal and external EU borders. This is the case for:

- the borders of the Iberian Peninsula (Spain-Portugal; Spain-France)
- the south- and north-eastern borders of France (with Belgium, Germany, Switzerland, Italy)
- the border between the United Kingdom and Ireland
- the borders of the Benelux countries (Belgium-Netherlands, Belgium-Germany, Luxembourg-Germany)

⁷⁰ See for example: **Tägil, S. (ed.) (1999):** *Regions in Central Europe. The Legacy of History*. London, 1999. **Smith, A. D. (1995):** *Nations and Nationalism in a Global Era*. Cambridge, 1995.

- the border of Germany with Denmark⁷¹
- some borders of northern Italy (especially with Switzerland and Austria, partly also with Slovenia)
- the borders of Hungary (especially with Slovakia, Serbia, Romania, Ukraine, partly also with Slovenia)
- some northern Greek borders (especially with the Former Yugoslav Republic of Macedonia and Bulgaria), the borders of Romania (with Moldova and Ukraine)
- the borders in the south east of Poland
- the borders of Latvia and Estonia (along their external EU-borders and to some extent along their internal EU-borders)
- and the borders of several Scandinavian countries (especially Finland, but also Sweden and Norway).

This overlapping constitutes primarily a “cross-border linguistic zone” and often also a wider “cultural transition zone”⁷² which is inhabited by two or more linguistic (and ethnic) groups which are typically separated from each other by a politically defined border.

Second, a number of “**hard linguistic demarcations**” closely follow the existing political borders in the EU. This is mainly the case for many internal EU borders of Germany (with the Netherlands, Poland, the Czech Republic), large segments of the Austrian borders (especially with the Czech Republic, partly also with Slovakia, Hungary and Slovenia), and Polish borders (with Russia, Lithuania, Belarus, Ukraine, Slovakia, the Czech Republic). Such a clear demarcation can also be found along some borders of Slovenia (especially with Croatia), Romania (especially with Bulgaria and Ukraine), Greece (Turkey) and Lithuania (especially with Russia, but to some extent also with Belarus and Latvia).

Third, a large number of “**linguistic islands**” are located across Europe, some close to a maritime or a political land border. They are less frequent in Western Europe and Scandinavia⁷³, but more common in South East Europe (i.e. the Balkans, Bulgaria, Romania and also Greece)

⁷¹ There is an officially recognised Danish-speaking minority in Schleswig-Holstein (Germany) and also a widespread bilingualism of Danish municipalities close to the border.

⁷² **Williams, C.H. (2004):** *The geography of language*. In: Sociolinguistics – An international handbook of the science of language and society. Volume 1, pp.130-145. Berlin 2004.

⁷³ Except the Celtic-spoken languages in France, the United Kingdom and Ireland; the Danish-speaking and Sorbian-speaking minorities in Germany; the Swedish-speaking population in Finland.

and in other Third Countries immediately neighbouring the EU (especially Ukraine and Russia, but also Belarus).

However, experience from the day-to-day border practice in the EU suggests that **it is difficult to derive from this basic constellation a generally valid overall conclusion.** Neither can it be concluded that all “hard linguistic demarcations”⁷⁴ naturally constitute also strong socio-cultural lines of division which considerably hamper the development of border areas and their mutual exchange relations. Nor can it be stated that the important asset of a “linguistic overlapping” acts as a catalyst which automatically stimulates the development of, and the mutual exchange relations among, neighbouring border areas.

The main basis for this qualified overall judgement is that the de facto development of a socio-cultural dividing line also greatly depends on how the concerned states (and regions) generally deal with aspects related to ethnicity or language in the context of their own domestic policies. This concerns not only issues such as a formal recognition of ethnic or linguistic minorities and the protection or official furthering of their specific cultural heritage (e.g. history, traditions, languages) within a country, but also the promotion of better understanding of neighbouring countries and cultures in the framework of domestic educational policies. Especially within a linguistically much more complex EU, which also aims to preserve this diversity as a fundamental democratic and cultural cornerstone of its own integration process,⁷⁵ the general promotion of language proficiency and the provision of targeted initiatives helping more people who live close to “hard linguistic demarcations” to become bi- or multi-lingual can play key roles for overcoming, in the medium and long term, continuing communicative and mental barriers or specific day-to-day problems.

“Border effects” and their complex implications

Border effects are usually analysed by macroeconomics in the context of trade theory (i.e. trade barriers and related border effects, with the latter being a measurement for the level of trade integration), the traditional

⁷⁴ i.e. those clearly following state borders and separating different people and language-use.

⁷⁵ The number of official languages increased with the joining of the new Member States from 11 to 23. The EU requires its legislation to be available in all these languages, thus making it accessible to all citizens. It also guarantees that any EU citizens can write to an EU institution or body and receive a reply in their own language. In the same way, a member of the European Parliament has the right to represent his or her voters in their own language when he or she rises to speak. The EU also helps to make this linguistic diversity accessible to others, e.g. by encouraging people in Europe to learn two languages in addition to their mother tongue.

location theory (i.e. borders representing a distortion in a market area, also leading to disadvantages for border regions), or new economic geography (i.e. focus on the distribution of economic activities across space & explanation of regional disparities by entirely endogenous location decisions). However, we consider the purely economic perception of such effects as being too narrow. Therefore, and to achieve a more differentiated perception of border effects, we have also taken into account other social science approaches which have analysed the general development of border and cross-border areas by taking into account a wider range of socio-economic aspects and socio-cultural and behavioural influences.⁷⁶

Our **general typology of border effects** (see: Table 1) is based on this more differentiated perception and uses the notion "border effect" as an overall term which encompasses all sorts of consequences that can result from the multidimensional reality of European borders (i.e. political borders as well as their natural, economic and socio-cultural characteristics). For each of the main features of this multidimensional border reality, the typology indicates the main reasons which explain the associated and potentially existing border effects.

This taxonomy mainly has a conceptual and explanatory value, because complex cross-relationships and cross-impacts exist in practice among the various types of border effects (i.e. some effects associated with one dimension might be alleviated or even further reinforced by effects associated with another dimension), particularly because all or most of the multidimensional features simultaneously characterise a given border.

This multitude of political-administrative, natural, economic and socio-cultural border effects can have variable implications for the domestic and border-crossing exchange relationships of a border which are rarely found in areas not located at a border. According to the nature of an effect, the following two basic constellations can be distinguished:

- **"Closure effects"** exist if the political border (and maritime boundary) or other main features of the multidimensional reality function at the same time as a "discriminatory filter" and as a "barrier" between adjacent areas. Closure effects can originate from

⁷⁶ See for example: **Reichman, S./Ratti, R. (1993):** *Theory and practice of transborder cooperation*. Basel/Frankfurt am Main, 1993. **Bramanti, A./Ratti, R. (1993):** *Verso un'Europa delle Regioni*. Milano, 1993. **Newrly, P. (2002):** *Transnationaler Regionalismus: Die grenzüberschreitende Zusammenarbeit am Oberrhein – ein Beispiel für die Fortentwicklung der europäischen Integration?* Münster-Hamburg-London, 2002. **van Houtum, H./Scott, J. (2005):** *Policy Considerations of Project Results: "Good Practices" and Situational Ethics of Cross-Border Cooperation*. EXLINEA Policy Paper. Berlin and Nijmegen, December 2005. Hufeld, U./Müller-Graff, P-Ch./Okruh, S. (2007): *Nachbarschaften innerhalb der Europäischen Union*. Baden-Baden, 2007.

the presence of a major natural obstacle (e.g. territorial break or discontinuity) or different political and regulatory systems (e.g. contradictory policies, administrative obstacles, various legal restrictions), but also from considerably different economic conditions (e.g. import/export restrictions & other trade barriers) and socio-cultural settings (e.g. language barriers and/or mental barriers) on either side of a border. Common to all these influential factors is that they deliberately prohibit or tend to make impossible, or at least involuntarily hamper, flows and exchange relations between border areas, or generate other unwanted side-effects⁷⁷ on one or both sides of the border.

- **“Opening effects”** exist if the political border (and maritime boundary) or other main features of the multidimensional reality function at the same time as a “discriminatory filter” and as an “interface” between adjacent areas. Positive effects can emerge due to the absence of a major natural obstacle (e.g. a highly permeable green border); different governance systems and economic settings which generate specific development opportunities or induce cross-border exchange relations⁷⁸; or similar socio-cultural settings which tend to favour the emergence of common mental or behavioural patterns (i.e. a feeling of belonging together due to a shared historical roots/cultural traditions or because the same language is spoken). Common to all these different influential factors is that they induce border-crossing inter-action and exchange relationships and thus establish a contact zone between the political, economic or socio-cultural sub-systems existing on either side of the border.

A more extensive version of this general typology (see: Annex 11) also contains, for each type-segment, a non-exhaustive list with concrete examples for such opening and closure effects, drawn from practices observable along various EU borders. A look at these examples reveals two important aspects which are worth briefly highlighting.

⁷⁷ Borders may enhance a clearly illegal behaviour such as smuggling or illegal immigration. Also the provision of pornography, of prostitution, of alcohol and/or of narcotics may cluster around borders, ports and airports.

⁷⁸ A border area may flourish on the provision of excise or of import–export services. Different regulations on either side of a border may encourage services to position themselves at or near a border. Special Economic Zones (SEZs) often tend to cluster near borders or maritime entry points (i.e. ports).

Table 11 General typology of border effects

Type of border effect	Main reasons explaining the associated border effects
Effects associated with political borders	Different status of the political border & different degrees of "openness" for economic exchanges & inter-personal relationships, different legal systems and different governance structures (administrative units & powers), different policies meeting at a political border.
Effects associated with maritime boundaries	Different levels of certainty / clarity about the maritime boundaries existing between states, also affecting economic and policy-relevant activities off-shore and on shore.
Effects associated with natural obstacles	Existence or non-existence of a natural obstacle (e.g. high mountain, large river & lake, sea or large maritime separation) & varying significance of the "barrier effect" represented by an obstacle.
Effects associated with economic discontinuities	Significantly different levels of economic performance (i.e. observed with respect to the overall situation or a specific issue) between areas located along a common border, acting at the same time as potential "push factors" and "pull factors".
Effects associated with socio-cultural dividing lines	Variations with respect to the general ethno-cultural & linguistic settings on either side of a border, different interpretation of the common historical legacy, different levels of inter-personal relationships existing between both sides of a border

First, a large number of closure effects continue to exist along the different EU borders.⁷⁹ Despite the existence of a homogenous Community-level legislation on the Internal Market, the different domestic legislative provisions which exist on either side of **internal EU borders** notably continue to hinder the day-to-day socio-economic and inter-personal relations across borders. Fields where this is particularly evident are taxation, social security systems, health care, public services, public procurement procedures, and educational and professional training systems (e.g. recognition of diploma, admission requirements for training courses). These differences still hamper the free movement of people, goods and services within the EU because they considerably reduce the overall transparency of a cross-border market and represent obstacles for

⁷⁹ See in particular the various articles on day-to-day border problems in: **AEBR (2000): LACE-magazine:** (Issue no.5 / winter 2000, Gronau). See also: **PANTEIA (2010): Ex-Post Evaluation of the INTERREG 2000-2006 Community Initiative funded by the Regional Development Fund. Final Report to the European Commission DG Regio.** Zoetermeer, 2010.

border-crossing business activities, especially for SMEs.⁸⁰ If, in parallel to such regulatory differences, marked cultural and linguistic differences also exist along a border, the scope of obstacles tends to further increase (e.g. existence of communicative & mental barriers or specific behavioural patterns). The closure effects and the day-to-day problems are even more accentuated in areas located along the **external EU borders**, because the free movement of people is considerably restricted due to the rules of the Schengen regime and an increased “securitisation” of those EU borders. But also the scope and efficiency of mutual economic interaction across borders is hampered, as many Internal Market provisions on the free movement of goods and services do not apply on the non-EU side of the border (except where countries have concluded specific agreements with the EU) and because of the frequently observable cumbersomeness of customs clearing processes (**see map in Annex 12**).

Second, it also becomes evident that only part of these border effects can be adequately appraised through purely quantitative approaches. A comprehensive assessment of the actual scope and significance of border effects, as well as of their concrete border-regional and cross-border implications, always requires the combination of sound quantitative and qualitative analysis. The latter, in particular, should not only explore the specific multidimensional reality of each border (e.g. physical, political, economic and socio-cultural features), but also shed further light on the primary “cause-and-effect relationships” and the complex interplay or cross-influence between the various primary border effects (i.e. secondary effects).

Border effects in practice: the case of cross-border commuting⁸¹

Cross-border labour market commuting along the internal and external borders of the EU27 is a good example which helps to better understand this complex interplay between different border effects. Although data-gathering on cross-border workers still appears to be difficult (see: Annex 13), a brief comparison of the aggregated figures presented in past and present studies⁸² shows that the overall volume of cross-border workers in

⁸⁰ e.g. knowledge-gaps about economic processes and sales opportunities on the other side of a border; different rules, structures and proceedings hampering access to new markets.

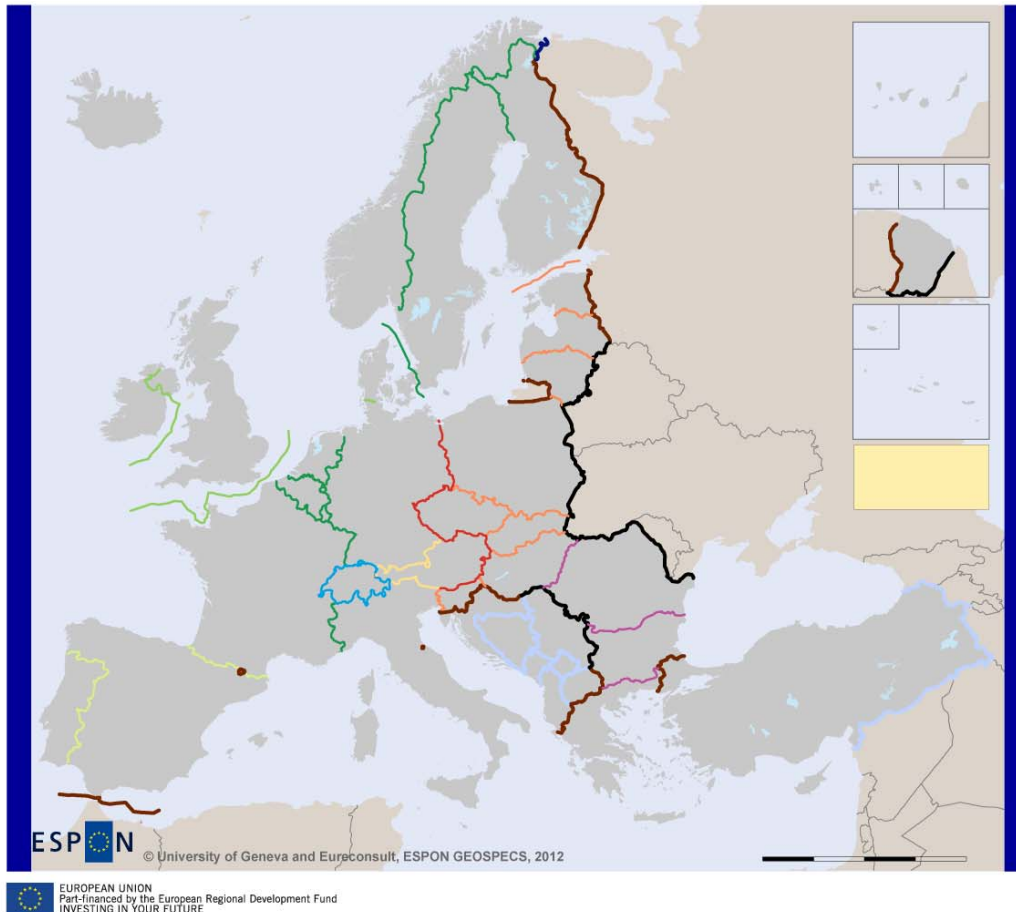
⁸¹ Overall findings drawn from an “internal working paper” elaborated for the GEOSPECS border group: **Stumm, Th. (2011):** *Mapping labour market integration within the EU27 and with neighbouring Third Countries and cross-border labour market mobility across EU27 borders*. Echternach/G.D. of Luxembourg, August 2011.

⁸² **European Parliament (1997):** *Les travailleurs frontaliers dans l'Union Européenne*. Série Affaires Sociales W 16 - 5/1997. Luxembourg, 1997 (PE 166.662). **European Commission, DG Employment and Social Affairs (2009g):** *Scientific Report on the*

the EU has more than doubled within one decade. from approximately 380,000 on average in 1990-1995 (EU15 & NOR, CH, LI) to 780,000 in 2006/2007 for the EU-27/EEA/EFTA countries. These cross-border commuter flows, today as in the past, concentrate mostly on the Central-Western part of the EU27 and also on a few countries and cross-border areas located along specific "old" internal EU-borders and the external EU borders with Switzerland (see: Annex 14). This dynamic but also geographically focussed development of cross-border commuting is the result of a complex interplay between various aspects.

A first factor is the **existence of general restrictions to labour market access**, which also lead to **variations in the openness of the different EU borders for commuting** (see Map 21). Within the EU27 and in some neighbouring Third Countries (i.e. Norway, Iceland, Liechtenstein, Switzerland), such restrictions were successively eliminated through the implementation of the EU Treaty provisions on the free movement of workers. While, until 2002, this process was always characterised by an immediate and also general application of the principle in the concerned EU15 Member States (i.e. after 1958 & the successive enlargements in 1973, 1981, 1986, 1994) as well as in the EEA-countries (since 1994) and Switzerland (since 2002), the realisation of this Community principle was less uniform after the 2004 and 2007 enlargements (see: Annexes 15 & 16). The main reason was that several EU15 Member States, as well as the EEA countries and Switzerland, were allowed to apply temporary restrictions for the labour market access of workers from the 12 new EU Member States.

From 2004, these restrictions also quite significantly limited the cross-border mobility of workers from the new Member States towards some of the old Member States (especially Germany and Austria, but also Italy) but, in 2011, they were fully lifted for the 10 new EU Member States of the 2004 enlargement. For workers from Bulgaria and Romania, however, such restrictions still continue to exist in some EU and EEA countries (until 2014) and in Switzerland (until 2016). **As regards the other Third Countries neighbouring the EU27**, the existence of general restrictions for the access of workers to the EU labour market is much more variable, depending on whether these countries have concluded specific agreements with the Union (see: Annex 17). However, the actual influence on cross-border commuting of those agreements or of existing restrictions is difficult to appraise along those external EU borders.



Date of total border opening for workers or current status

**Internal EU-borders
& external EU-borders
with EEA/CH**
*(realisation of the EU-principle
on a free movement of workers)*

- 1954* - 1958
- 1973
- 1986
- 1994
- 2002
- 2004
except SI-IT
and FI-EE: 2006
- 2009
except RO-BG: 2007
- 2011

**Other external EU-borders
and external EEA-borders**

- Countries having concluded agreements with the EU
- Countries with no specific agreement with the EU
- Norway-Russia: specific regulatory provisions for Russians seeking employment in North Norway.

Other borders in the ESPON space

- Intra-Balkan borders and Eastern land border of Turkey: general situation unknown
- Non EspoN space border
- ESPON space
- Non-ESPON space

* Agreement on a common Nordic labour market of 1954, creating similar rights.

Map 21 Current situation of labour market integration along different borders of the ESPON space

Further to this more general aspect, the recent DG EMPL study⁸³ also examined the influence of other “push & pull factors” and specific border obstacles on the cross-border mobility of workers in the EU27/EEA area (including CH). For significant economic differences existing between areas on both sides of a border (e.g. income levels, overall employment / unemployment situation; specific types & quality of jobs available), the study generally concludes that these “push & pull factors” are often a necessary condition for stimulating cross-border commuting but also that they cannot sufficiently explain all mobility patterns and trends.⁸⁴ Equally important are other obstacles which commuters face on a daily basis along the internal and external EU borders examined, due to their specific status as cross-border workers (see: Annex 18). National legal provisions (e.g. fiscal, social) and specific administrative practices or geographical and social barriers, as well as an individual opportunity/risk assessment, can all hinder job-seekers from leaving their home region to look for work across the border. From a ranking of such obstacles according to their relevance for mobility, the following appears (see: Annex 19). For all cross-border areas examined, the most important obstacles to mobility result from different language settings and a lack of information (major obstacles), followed by those associated with different regulations, tax and social systems or the non-existence of adequate transport infrastructure to overcome geographical barriers (medium obstacles) and by those relating to different mentalities (minor obstacles). However, the results also point to remarkable geographic differences among the cross-border areas with respect to the significance of those obstacles. The significance is lowest in cross-border regions covering the internal borders between the 12 new EU Member States, higher in cross-border regions covering the internal borders between the 15 old EU Member States, and highest in cross-border regions covering borders between old and new Member States.

In addition, in the context of the **macro-regional labour market integration between the five Nordic countries** (Denmark, Sweden, Norway, Iceland, Finland), many border obstacles hinder cross-border mobility of workers in practice and still make it difficult for Nordic citizens to work in a different Nordic country from their own (see: Annex 20).

⁸³ **ibid. European Commission (2009).**

⁸⁴ **ibid. European Commission (2009), p.18, 19, 22:** In the case of out-commuting, the influences of (...) push factors are rather weak. *Even a bad economic situation of a country is not a sufficient incentive for out-commuting.* In the case of in-commuting, evidence confirms the push-and-pull theory: *Countries with high income and low unemployment attract the highest numbers of cross-border commuters. It must be emphasized that these are just general conclusions. The situation can be very different in certain cross-border regions.*

The basic pattern of socio-economic relations in border areas

If one reflects in a more general way on the multidimensional reality of borders and the complex interplay between the variety of potentially existing border effects, **one can identify two clearly different patterns of socio-economic relations from a territorial perspective** (see: Figure 8 below).

The first pattern of **"half-circle social and economic relations"** generally prevails in border areas, where the exchange relationships with the domestic hinterland are comparatively stronger (more intense) than the relations across the border. The second pattern of **"full-circle social and economic relations"** usually prevails in regions more centrally located within the domestic context, where strong exchange relations generally tend to exist with all of the immediately surrounding domestic areas.

The **general conclusion** to be drawn from these two constellations is **that a degree of "territorial non-integration" exists between immediately adjacent border areas**, resulting from the fact that all kinds of socio-economic interactions and exchange relationships are here still not yet functioning in a way that comes close to what is normally experienced in the domestic context.

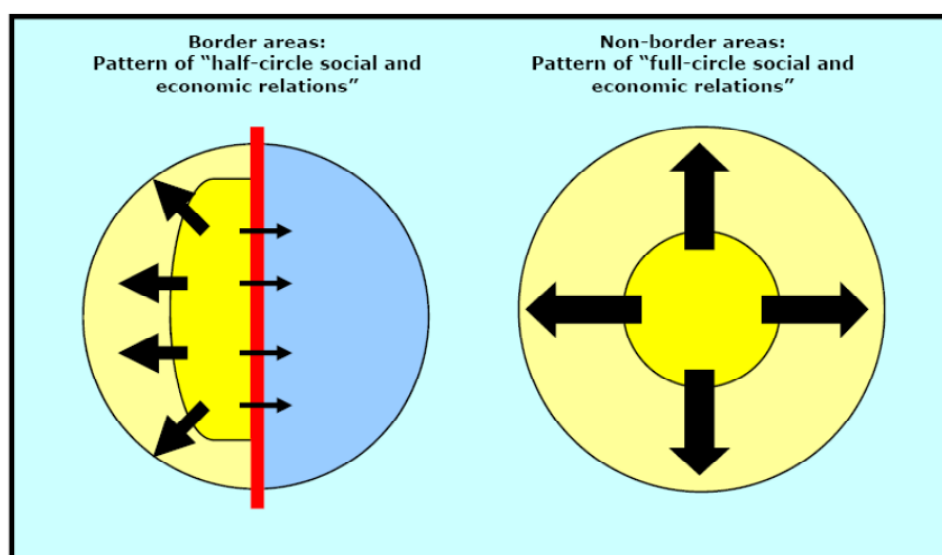


Figure 8 Basic patterns of socio-economic relations existing in border areas & non-border areas

The approach adopted for delineating border areas

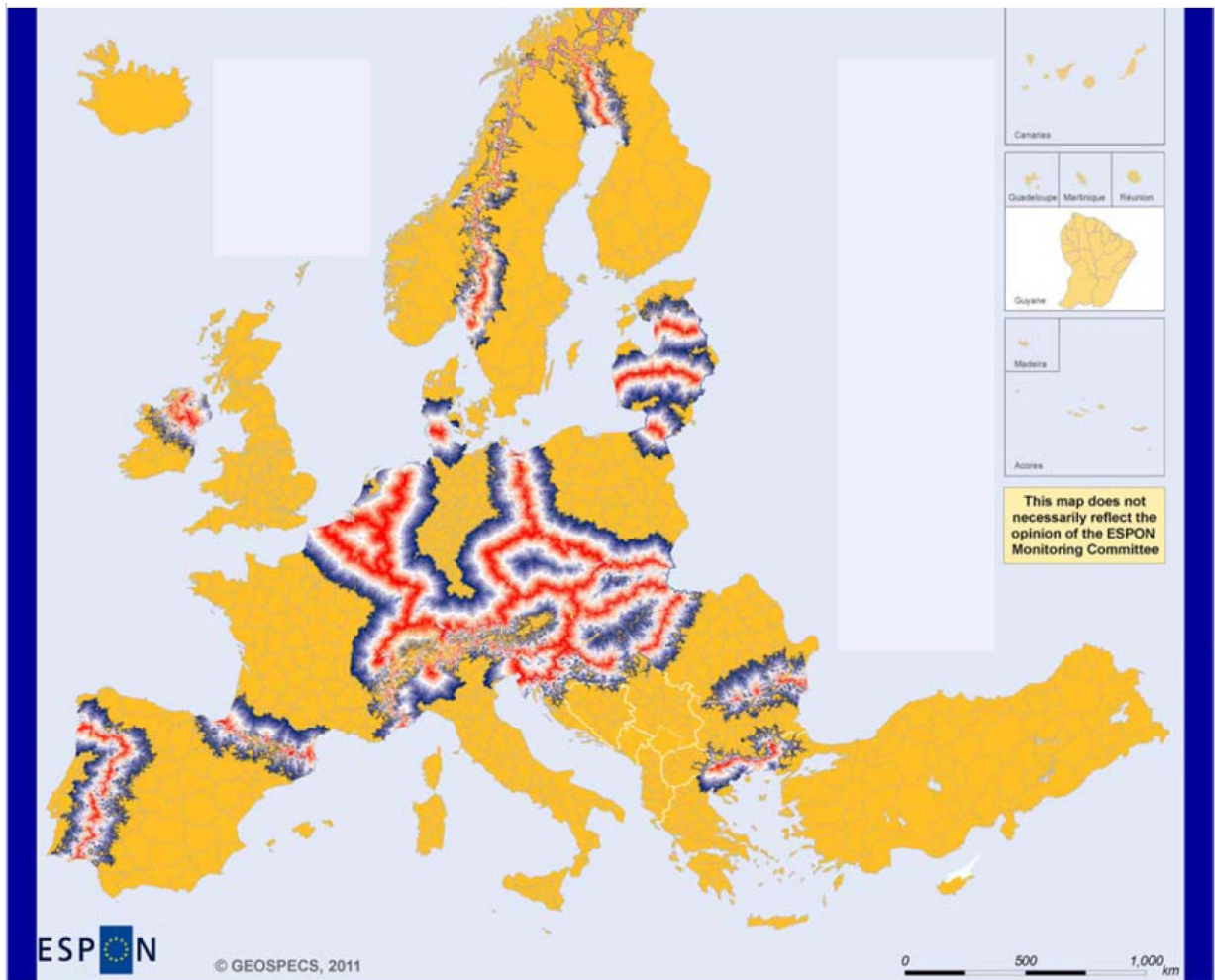
From the discussion above, it is clear that **the specificity of border areas** is mainly constituted by (1) the multidimensional nature of European borders, (2) the existence of a variety of associated border effects which are interrelated in a complex way and create different ranges of mobility and interaction between neighbouring border areas and (3) a degree of territorial non-integration which exists between areas located along a common border with respect to the overall socio-economic and socio-cultural conditions.

Therefore, GEOSPECS understands border areas as **a geographic category with variable geometry for which the notions of "interface" and "buffer zones" are considered to be the most appropriate general characterisation.**

As a consequence, **GEOSPECS did not consider it meaningful to produce a general delineation of border areas which follows the static administrative definition** used in generally comparable ways by the current Structural Funds regulations, the "Fifth Cohesion Report" or the previously published "Green Paper on Territorial Cohesion" (i.e. *border regions are NUTS 3 regions which are eligible for cross-border co-operation programmes under the European Regional Development Fund regulation*).⁸⁵

Instead, GEOSPECS delineated border areas on the basis of a 45-minute travel distance to a politically defined borderline, which corresponds to a reasonable proxy for a generally acceptable maximum commuting and daily mobility distance. The zone delimited by this reference value is used to analyse and better understand the large range of factors influencing the socio-economic development processes of border areas, as well as the types of interaction generating specific local / regional and cross-border identities which are an important factor of development for this geographic specificity. However, by changing this time-distance parameter (< 45 min. or > 45 min.) and by mapping the results (see Map 22 and Map 23), one can easily see that the extent of border areas varies considerably across Europe.

⁸⁵ This is mainly due to the fact that the territorial coverage of those NUTS 3 border areas is extremely variable across the EU and that especially the larger NUTS 3 units do often not fully reflect the outreach of functional exchange relations existing along and across borders.




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Regional level: NUTS 5
 Source: Multiple, year >2008
 Origin of data: > 2008
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Traveltime to internal EU borders (EU27, CH, NO)



Map 22 Travel time distances to internal EU borders




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Regional level: NUTS 5
 Source: Multiple, year >2008
 Origin of data: > 2008
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Traveltime to External EU Border (EU27, CH, NO)



Map 23 Travel time distances to external EU borders

3.2.6 Inner Peripheries

The concept of Inner Peripheries (IP) as such is new in the European policy arena, as shown by the fact that no policy documents at European level deal explicitly with it. Inner peripheries are also unaddressed in most European countries. However, different policy and scientific documents on spatial planning and regional development at the national level specifically approach those 'places' that suffer from socio-economic decline or stagnation. For these reasons, Project partner 2 conducted face-to-face interviews with national experts, in addition to the planned literature review of national policy documents and grey literature.

From the literature and interviews emerges the fact that the term 'peripherality' does not primarily refer to being in the outer margins of any given territory. It is more often used to describe territories that are considered to be "out of the loop" and whose socio-economic performance is below average in a region. This makes the concept quite complex. Insofar as IPs are not primarily defined by their geographic characteristics, this category of areas is different from the other categories studied in GEOSPECS.

The distances that create situations of "inner peripherality" are not the Euclidian ones to a hypothetical "centre", but linked to the configuration of physical, social, economic, institutional and cultural networks. Admittedly, the functioning of these networks of interaction may in turn be influenced by the settlement structures of the region/country (centralised or polycentric), as well as by specific bio-physical characteristics and socio-economic trends (e.g. land cover and linked land use dynamics and functionalities, population density, accessibility). Inner peripherality may appear more frequently in rural areas that are "in the shadow" of larger metropolitan areas or separated from nearby rural centres by national borders. However, no territorial configuration directly or necessarily leads to a situation of inner peripherality. This is why the concept of IP is wide-ranging and impossible to delineate for the whole ESPON area and should not be considered as a geographic specificity category.

What are Inner Peripheries? Do they have links to other geographic specificities?

The literature review on IPs revealed scarce and patchy information, insufficient to achieve a comprehensive understanding of the concept. Consequently, researchers from Project partner 2 collected data through documentary analysis and interviews with six people who steer spatial planning at a strategic level in four European countries: Belgium, Germany, the Netherlands, and the United Kingdom. A more detailed

description of the survey's results can be found in the GEOSPECS Interim Report (March 2011). Main relevant planning documents are listed in Text box 1, while key findings of the survey are summarised in Table 12.

Text box 1 Key references

The Netherlands:

- Nota Ruimte (2006) 'One of the main conclusions is that the conservation of nature/landscape and accessibility will benefit from the concentration of urban developments. The Policy Document on Spatial Planning aims to concentrate new urban developments around existing larger cities. This gives the opportunity to create the desired urban and green living environments, while at the same time it will minimize the negative impacts on nature and landscape and keep employment and services accessible'
- 'Ruimte in cijfers' (2008)
- 'Vele steden maken nog geen randstad' (2006) Report on commuting patterns and the urban interland '*het nieuwe ommeland*'. The travel time is much more relevant than the Euclidian distance. The latest developments in the high-speed train network show a trend in which only very large cities are connected.

Germany:

- The most important reference source is the Spatial planning report (published every 5 years).
- Perspectives of Spatial Development in Germany, BBR Bonn (2006)
- Concepts and Strategies for Spatial Development in Germany, Secretariat of the Standing Conference of Ministers responsible for Spatial Planning, Federal Ministry of Transport, Building and Urban Affairs, Berlin (2006).

Belgium:

- The SDER (Schéma de développement de l'espace régional) (1999), with a diagnosis being updated by the Conférence Permanente du Développement Territorial (CPDT); the objectives and actions will be reviewed based on this diagnosis. The new version of the document should be approved at the end of 2012.

Table 12 Summary of results of first consultation on Inner Peripheries in Europe

Country	Concept of inner periphery	Definition	Examples	National policies dealing with the concept
Belgium (only Wallonia)	The concept is linked to areas that have lost their identity as urban or rural, i.e. they are neither rural nor urban, but "in between"	There is no definition at the national/regional level. They, however, could be defined as an area where the traditional rural economy has lost importance, so that it is no long appropriate to talk about a rural area, and where the population is not dense enough to be called an urban area.	Couvin, Philippeville, Chymay, Marche. The west-east industrial axis: Sambre, Meuse and Vesdre.	The PRAT (Plan Regional d'Aménagement du Territoire) was created in the 1980s and ignored until 1991 when it generated debate. As a result, it became the SDER (Schema de développement de l'espace regional) in 1999. The new version of the document should be approved at the end of 2012.

Country	Concept of inner periphery	Definition	Examples	National policies dealing with the concept
Germany	<p>The origin of the concept is the settlement structure in Germany that is polycentric and not centralised. IPs are identified with a development concept that is a question not of urban or rural, but of being a centre or a periphery.</p> <p>The IP concept is about 30 years old. There is a classic typology in Germany dealing with population density and centrality. Centrality is based on important urban centres (high-order and middle-order) for the functions of infrastructure and services (defined by population, jobs, universities, hospitals, administrative centres, etc.). These urban centres are defined by the Länder. There are approx. 120 high- order and 900 middle-order centres. These typologies have an analytical purpose and make the types comparable to each other. The function of other typologies is to divide Germany into zones that should cooperate, giving direction for planning; they are not based on political divisions.</p> <p>There is a relevant map to identify IP that shows commuting patterns. It is based on the working and living locations that are registered by the German social security: Commuting patterns. Perspectives of Spatial Development in Germany, BBR Bonn, 2006, p 26</p>	<p>They are described by several indicators based on the accessibility model, e.g. population density, accessibility of daily population, potential population or potential jobs. Another criterion is that IP do not have – high-order or middle-order urban centres.</p>	<p>Arendsee (Altmark) located between three Länder; area around Kassel (incl. Werra Meißner Kreis); Northwestern area close to the islands of the Baltic Sea; in the Eiffel region; the centre of the triangle between Dresden, Leipzig and Chemnitz.</p>	

Country	Concept of inner periphery	Definition	Examples	National policies dealing with the concept
The Netherlands	Does not exist as a policy category but can be defined in different ways depending on the philosophies of successive governments.	The Netherlands Environmental Assessment Agency (PBL) uses the concepts of high dynamic and low dynamic areas. The latter could be considered as IP.	Restricted development areas (the Green Heart); regions suffering from decline or stagnation (East Groningen, Parkstad Limburg, Zeeuws-Vlaanderen).	The socio-economic policies in the 1950s-1980s focused on de-concentration of urbanisation (so-called 'guided de-concentration'), in which attention was given to the rural areas with low amenity levels and population decline. In contrast, policies in the 1990s focused on strengthening regions with economic growth, e.g. Nota Ruimte (2004) focused on the main development ports. The latest policies have further put the focus on economic strength, and shifted the governance from national to provincial authorities.
United Kingdom (England)		There is no definition at the national/regional level.		

The interactions of IPs with other geographic specificities are considered as follows:

- Border regions have a clear interaction since many IPs are located in the political borders between two or more countries and this has important consequences for their development.
- Coastal areas located in the centre of Europe can also be seen as a kind of IP between the land and the sea.
- Sparsely Populated Areas are different from IPs since they do not have a critical mass for development in relation to the surrounding areas.

Characterisation, classification and databases for mapping of Inner Peripheries

Inner Peripheries can be described according to several socio-economic, political and geophysical characteristics, as shown in Table 13.

Table 13 Main socio-economic, political and geophysical characteristics of Inner Peripheries

Category	Characteristics
Socio-economic	Demographic decline (due to e.g. lower birth-rates, migration) Ageing Decline in Services of General Interest (e.g. hospitals, schools) Relatively close to hubs of large economic development, but too far away to profit from them directly Lack of economic diversity Loss of local identity
Political	Political border between countries, e.g. Parkstad in NL (border with DE and BE) Political borders within countries, e.g. Länder borders in DE Restricted development areas/zoning, e.g. Green Heart (Groene Hart) in NL Closing down of main economic activities, e.g. mines in Limburg (NL) Closing down of Services of General Interest
Geophysical	Close to natural barriers, e.g. the estuary of the Scheldt river (NL)

The concept of IPs is dynamic, i.e. inner peripheries are not stable in either time or space. Consequently, their description should not only be limited to the current state but needs to consider historical trends leading to the present situation. This implies that their characterisation at the European level is very difficult since it is context/place-based and requires historical datasets for socio-economic indicators that are not available at pan-European level at the appropriate spatial resolution.

Trends in Inner Peripheries

There are two main trends that are interlinked: the decrease in jobs and the decrease and ageing of population. Because of the lack of jobs, the population, especially young people with high mobility, find jobs in urban centres that require commuting a long time/distance (more than 1-2 hours) and then move out. A well-known trend is the migration from East to West Germany. An important issue concerning these trends is the development of transport corridors to improve accessibility. This was the reason for building the Baltic highway, linking the North-western and North-eastern parts of Germany, in order to increase accessibility in the stagnating areas close to the Baltic Sea. However, it seems that the expected impacts on the IPs in the region are not yet very visible. For the IP of Parkstad (NL), enhancing accessibility by building a new highway, train services and a new airport in the nearby city of Maastricht has not yet resulted in development.

Can inner Peripheries be classified?

Databases relevant for the characterisation of Inner Peripheries

At the European level, it is difficult to provide a unique classification based on the main characteristics presented in Table 1, since contextual factors play a key role in enhancing or decreasing their importance. Consequently, many potential IP areas could be identified, but only some of them really are. In an attempt to classify the various sub-types of IPs, a range of categories may be used, bearing in mind the contextual differences mentioned above:

- Shrinking or growing areas (based on population density trends);
- With or without regional centres;
- Urban or rural;
- Cities or regions.

At the national level, the category of IP periphery only exists as such in a few countries. In our research, Germany was the only country for which (recent) 'inner periphery' literature was found (see Text box 1). In the other countries studied, although the category of IP does not exist as such, several available datasets show trends linked to these different low-dynamic areas. The indicators selected will depend on the specific characteristics of the country. For example, in the Netherlands, the CBS (Dutch Central Statistical Office) and PBL (Netherlands Environmental Assessment Agency) have analyses on past and future trends on employment, income, and total population that are used for monitoring but no specifically regarding the regions associated with 'inner peripheries'. There are yearly national evaluation reports on societal trends from PBL 'Balans voor de leefomgeving'

⁸⁶(Human environment status report); another national monitor on spatial developments is the Nota Ruimte⁸⁷. In Wallonia (Belgium), there are some studies on socio-economic developments from the Conférence Permanente du Développement Territorial (CPDT) (see Text box 1). In the United Kingdom, general socio-economic trends can be found at the Office of National Statistics website⁸⁸.

(iii) At the regional level, countries have different classifications and measures to monitor socio-economic developments in regions with characteristics of IPs. However, as mentioned above, to our knowledge Germany is the only European country where the 'Länder' (administrative regions) have their own classifications and measurements to identify IPs. At the national level, the work of the Federal Office for Building and Regional Planning (BBR) provides to the Länder the concepts and guidelines for the characterisation of IPs. In the spatial planning rules for the whole of Germany, each 'Land' has to take into account the planning of adjacent Länder (horizontal) and the planning at other levels (vertical). The guiding principle is to have a coherent development framework. Data on spatial observation can be found on the BBR website⁸⁹. The developments are monitored by the Federal Statistical Offices that collect regional statistics. BBR builds indicators based on these statistics, which are like 'early warning systems' on living conditions at the federal level, e.g. regional population prognoses based on the demographic structure of the population, historical trends and national and international mobility. In addition, each Land has its own statistical office monitoring specific developments in its territory.

Although the delineation of IPs at the European scale is difficult due to the lack of harmonised datasets on socio-economic indicators at relevant spatial and time scales, some of the key elements identified in Table 2 can be used to create meaningful delineations of IPs at the regional scale:

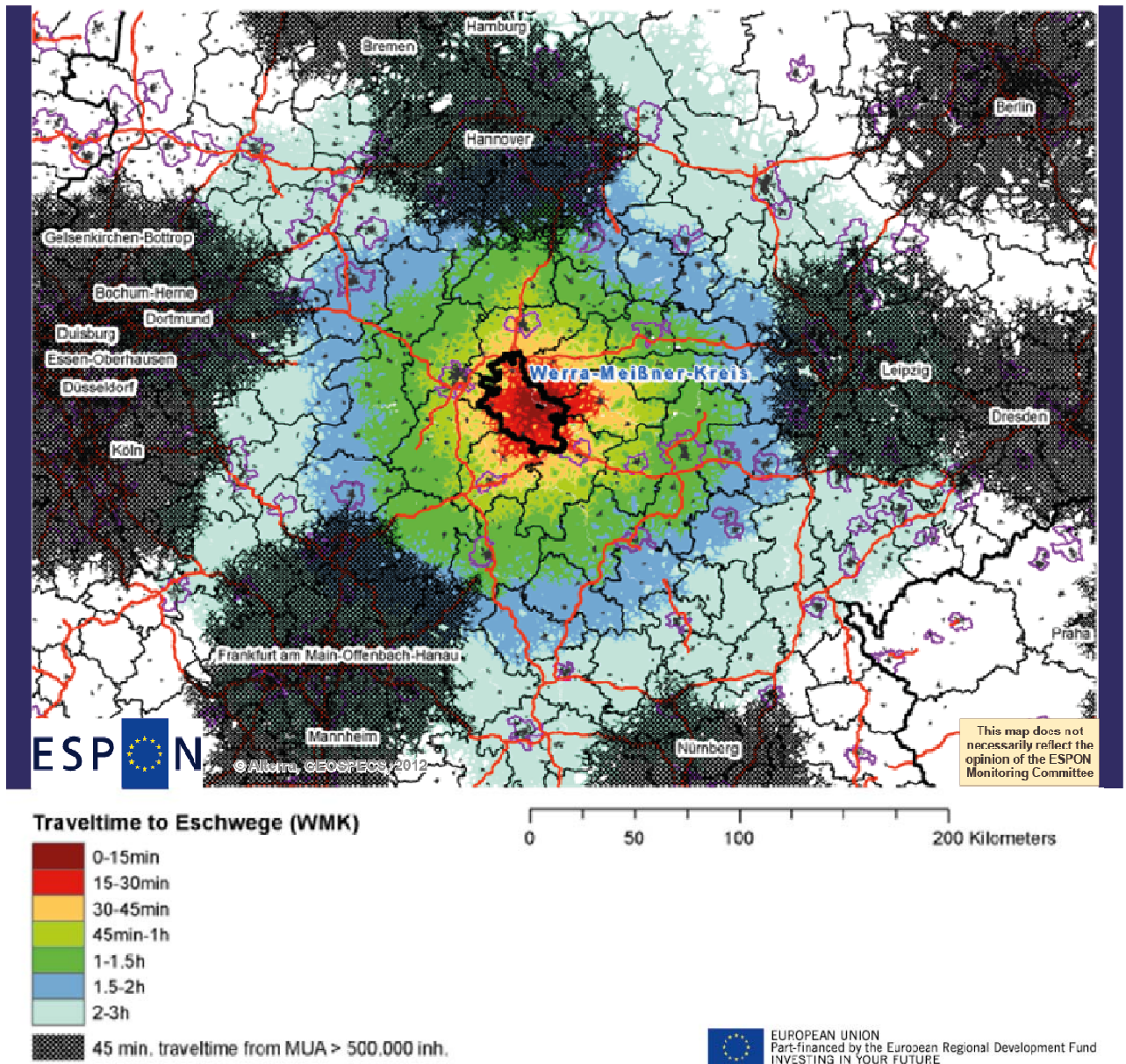
- Accessibility to the metropolitan cores in terms of travel time. A combination of a detailed European road database with information on core metropolitan areas is used to create maps with absolute and relative travel times; these are important, for example, for commuting distances and distance to services of general interest (Map 24 and Map 25)
- Population potentials, i.e. how many people living in the region can be reached in an acceptable travel time (Map 26).
- Socio-economic information as a proxy for the functioning of regional economies. NACE LAU2 data can be used to show differences and functional linkages between IPs and their surrounding (metropolitan) cores. The total number of jobs is shown in Map 27.

⁸⁶ <http://www.pbl.nl/balansvandeleeftomgeving/>

⁸⁷ <http://www.rijksoverheid.nl/onderwerpen/ruimtelijke-ordening/documenten-en-publicaties>

⁸⁸ www.ons.gov.uk

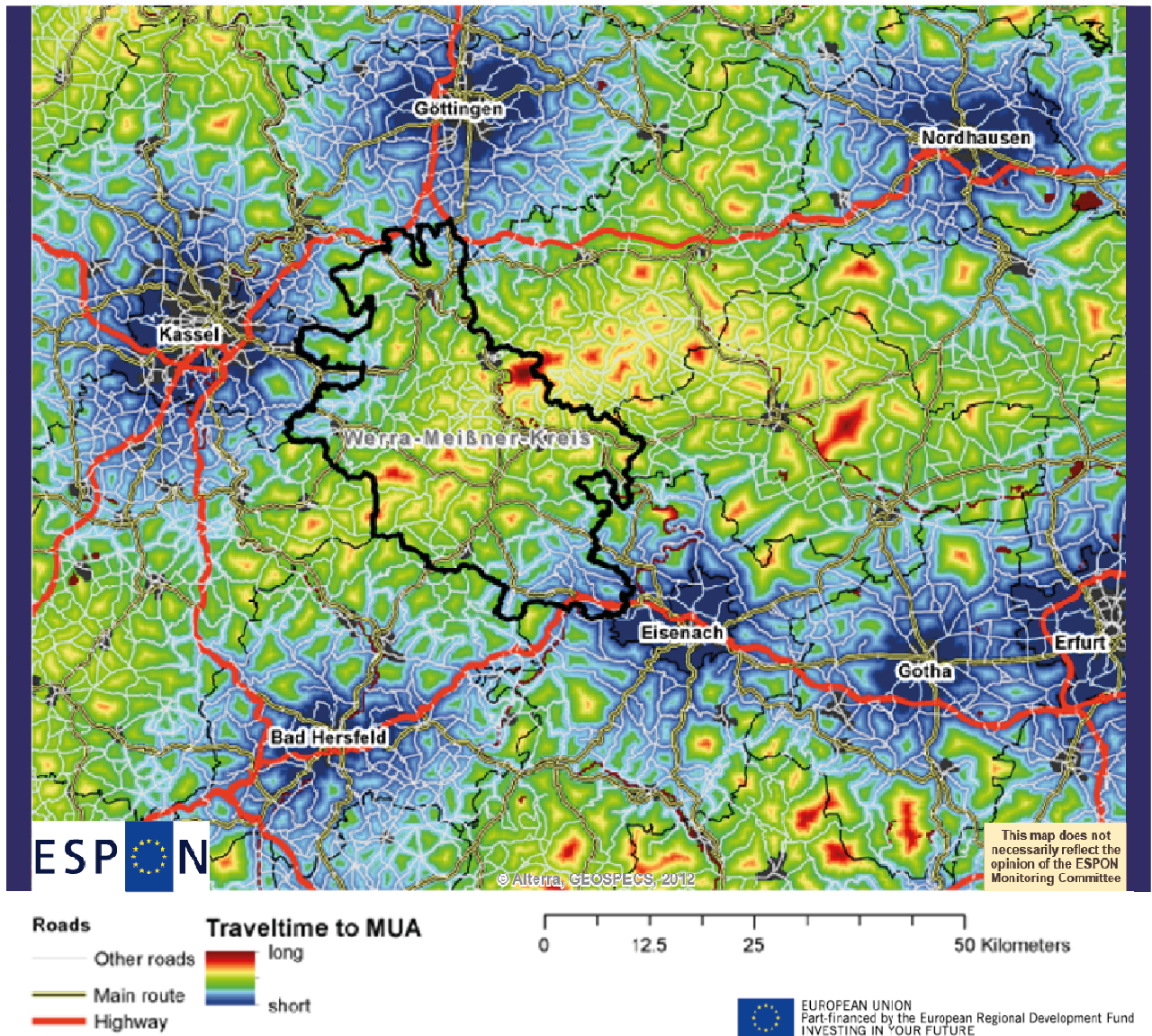
⁸⁹ www.raumbeobachtung.de



Map 24 Travel time to metropolitan cores at supra-regional level from Werra-Meißner-Kreis

Travel time to metropolitan cores calculated at supra-regional level, from a German IP (Werra-Meißner-Kreis) situated in the periphery of five major MUAs.

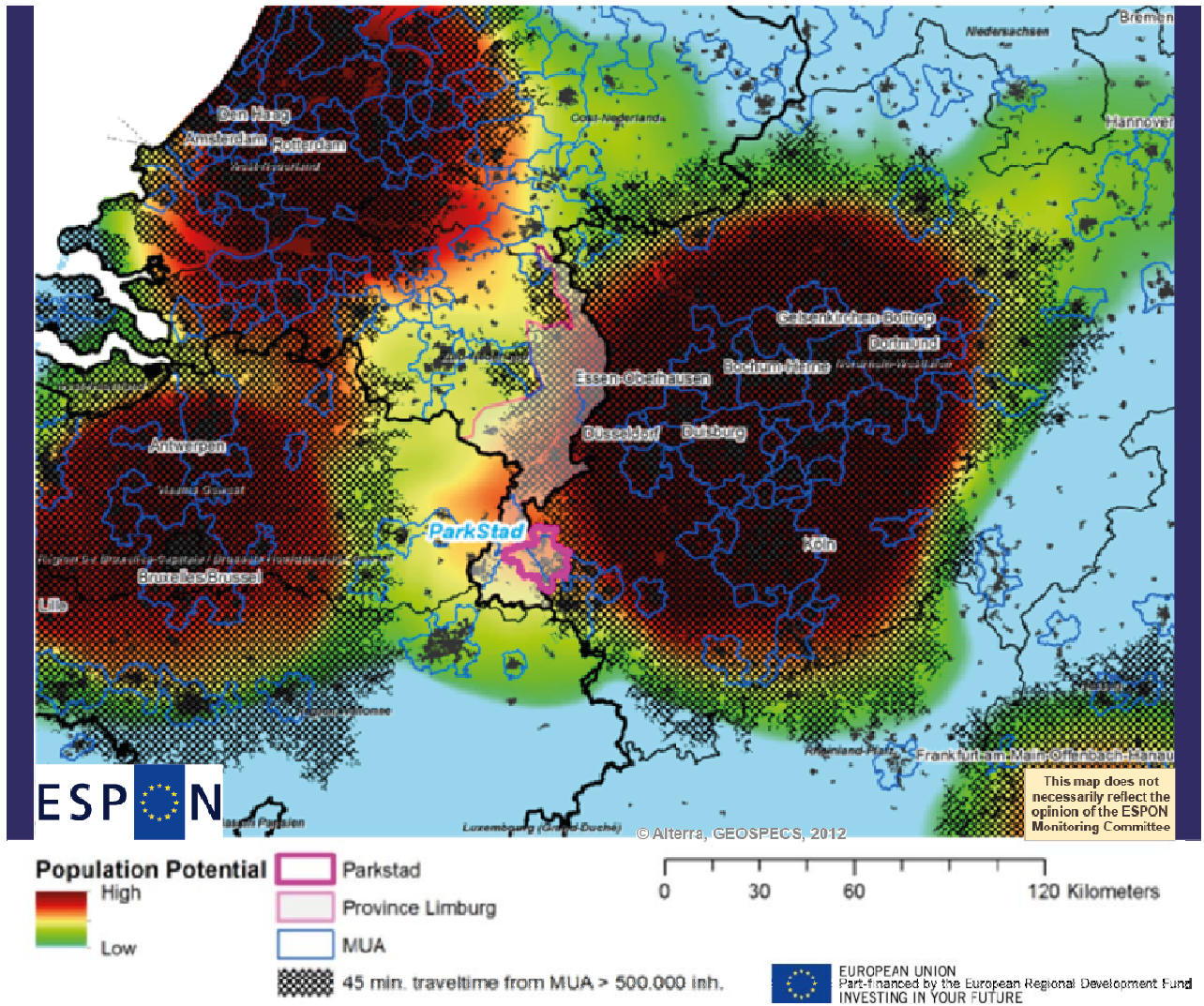
The 500 000 inhabitants threshold used to identified these MUAs corresponds to the population of the Functional Urban Areas (FUA) associated with the MUA.



Map 25 Travel time to metropolitan cores at regional level from Werra-Meißner-Kreis

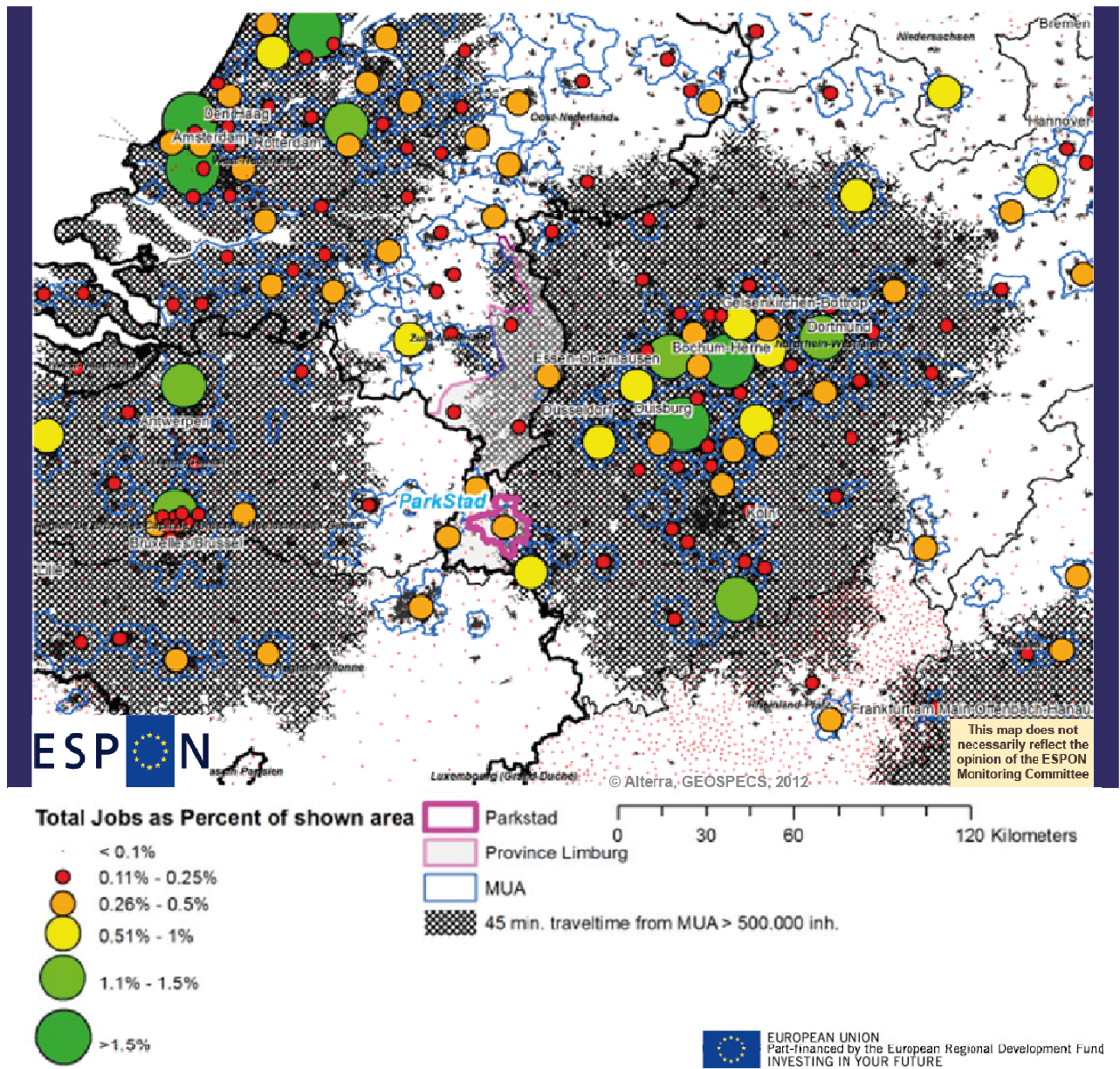
Travel time to metropolitan cores calculated at regional level, from a German IP (Werra-Meißner-Kreis) situated in the periphery of five major MUAs.

The 500 000 inhabitants threshold used to identified these MUAs corresponds to the population of the Functional Urban Areas (FUA) associated with the MUA.



Map 26 Population potentials mapped at supra-regional level around Parkstad

The map shows the location of a Dutch IP (Parkstad) just outside the reach of core development centres with large populations.



Map 27 Total jobs (% of shown area) as a proxy for the relative functioning of regional economies (based on LAU2 NACE information)

Strengths and weaknesses of Inner Peripheries

What are the strengths and linked development opportunities of Inner Peripheries?

The strengths of IPs are generally associated with the functions that are scarce in the neighbouring areas, although this is obviously not all that matters. The main identified strengths are:

- **Presence of natural areas**, relevant for nature conservation itself, but as well for other functions. Protected nature is attractive to live in and for recreation, e.g. the Green Heart in the Netherlands. However, if many people move there, this specific attractiveness will disappear.
- **Unexploited space** in central locations between different cities or countries that can be used as 'low pressure' areas in highly densely populated regions or countries, for different functions such as:
 - Building areas for industrial estates or residential areas (e.g. for retired people);
 - Recreation and leisure activities (e.g. post-industrial cultural landscapes, attraction parks);
 - New green natural spaces that can be used, in turn for multiple functions, e.g. recreation and leisure, becoming part of ecological networks or Green Infrastructure;
 - Production of energy, by using the space to provide the infrastructural facilities for power lines, wind turbines, solar energy parks, etc.;
 - Production of food, biofuels and timber
- **Cultural and historical heritage**, which is crucial for the regional identity of the population.
- **Lower land prices** in rural or peri-urban areas close to city centres. For example, in the centre of Liege, the land price is about 100 euro/m², whereas in the IP outside, the price is about 40-50 euro/ m².
- **Quietness.**

What are the weaknesses and associated challenges for Inner Peripheries?

The weaknesses of IPs are mainly associated to the fact that the number of people living there is below the threshold for a healthy and stable economy and for the provision of services of general interest. For example, in Germany, the costs of infrastructure (e.g. waste water) have been found to be much higher in IPs than in other regions; a potential population of 40,000-50,000 inhabitants is considered the critical mass for development⁹⁰. The main weaknesses recognised in the present study are listed below. It should be noted that this is the full list and does not apply to all IPs:

- **Ageing of the population**, with young people leaving the area in search of jobs ;
- **Lack of jobs and high unemployment** rates, fragile economic life;
- **Low financial power**;
- **Poor public transport services**, resulting in high travel times;
- **Not all services of general interest are available**, e.g. few or nonexistent primary and secondary schools, health centres, cultural centres, cinemas, theatres, shopping centres;
- Non-existent, slow or expensive **broadband connections**.

The main obstacle to economic development is that not all the required services required to establish a new company are available nearby, e.g., banks, or tax experts. For such aspects, proximity is always necessary; internet cannot replace everything.

Can Inner Peripheries be mapped as a geographical specificity?

As mentioned in the first section, Inner peripheries are not primarily defined by their geographic characteristics, despite some of them are located in border regions. Their main identification criteria are socio-economic: economic developments (e.g. loss of jobs), demographic trends (e.g. ageing, migration), political factors (e.g. peripheral location in relation to the centres of the national economy, border barriers in legislation) and socio-cultural factors (language barriers, loose of social cohesion). Consequently, in IP the distances that contribute to determine the conditions for economic and social development are not the Euclidian

⁹⁰ - Perspectives of Spatial Development in Germany, BBR Bonn, (2006)

ones to a hypothetical “centre”, but linked to the configuration of physical, social, economic, institutional and cultural networks. This explains why it is unfeasible to delineate or map all the IP in Europe based on a unique set of variables that are available at pan European level and unique thresholds. This was clearly demonstrated when attempting to map the inner peripheries of the case studies, using two variables usually associated with peripherality, i.e. accessibility and population potential, showed the complexity of their spatial identification. The inner peripheries studied were not less accessible or had a lower population potential than other neighbouring metropolitan areas.

In conclusion, it has not been feasible to map Inner peripheries based on the available set of indicators that are static in time and do not show the temporal trends, which is the key factor describing Inner Peripheries. Therefore additional maps showing dynamic developments in key socio-economic indicators, e.g. employment, net migration, ageing, will be needed to identify inner peripheries.

Policy options to approach the challenges and develop opportunities in Inner Peripheries

The analysis of the challenges and opportunities in the previous two sections serves as the basis for identifying potential policy measures to promote development in IPs. The development in GEOSPECS of the nexus diagram, in which the historic legacy is linked to the challenges and opportunities of the region under study, has proved to be very useful to identify the key factors and their interconnections, and therefore find effective ways to answer the development needs of the region. An example of a nexus diagram for the Parkstad IP in the south eastern Netherlands is shown in Figure 9.

Policy options at the national level

In The Netherlands, there is currently a debate to find new ways of development. On the one hand, it is thought that promoting new economic sectors can be vital in these areas, a ‘new impulse’. On the other hand, measurements preventing negative effects of development decline are also being considered. A crucial aspect is to determine the appropriate administrative level (national, province or municipal) responsible for the measures.

In Wallonia (Belgium), measures are being taken to increase the ‘critical mass’ of the individual municipalities by merging them. For example, Tournai is the largest municipality of Wallonia in terms of area, but not the number of inhabitants, and has been combined with 17 small

municipalities or "communes. However, such efforts need to be accompanied by supporting measures to achieve a new balance of the functions. The main objective is to achieve a diversified economy by introducing small businesses and economic activities. In the United Kingdom, the supporting measures are also focused on supporting local enterprise and economic development.

Sectoral policies can play a relevant role for IPs, such as agricultural policies with subsidies to farmers for providing environmental public goods. Other relevant sectoral policies are those dealing with Housing (second homes), Industry, Energy, Transport and Regional economic development programmes. In Germany the most important sector is Education, to provide equal chances to all children to be educated (good access to education). It is very important to take care of those who stay in these peripheries because they are the future.

Policy options at the European level

The concept of IPs, as considered at the national level, will probably change when being approached at the pan-European level. For example, the German IPs are development zones or zones with high potential development because they are centrally situated in Europe. Therefore, at the European level, it will be important to consider the development of secondary networks. The best approach would be to have development corridors across Europe. In addition, IPs close to the national borders could change their role if approached at trans-national level. The concept of IP is not only a question of scale but also of transport options (air, train, highways). For example, central Austria is difficult to reach because it is surrounded by mountain areas and the network of cities along the border has the best transport infrastructure.

The European policy areas that have been identified to be most amenable for application in IPs are:

- Territorial cohesion will be relevant, helping to identify regions with similar problems and analyse best practices to learn from each other. They could help to strengthen the social cohesion between urban and rural areas. 'Inner' peripheries can play an important role in territorial cohesion compared to 'outer' peripheries, since they are embedded in a better territorial structure and this potential should be used. This is why a system of development corridors across Europe would be relevant to develop them. Measures improving transport must be complemented by closed local markets so the profits stay within the region;

- Trans-European Networks (TEN) would be interesting for IP when focusing on the development of the secondary lines (local and inter-regional transport). The current TEN infrastructure connects only large cities ;
- Structural Funds at national level; although some countries may have problems with eligibility.
- Finally, the recently launched Europe 2020 growth strategy, with its five ambitious objectives on employment, innovation, education, social inclusion and climate/energy - to be reached by 2020. It may be very relevant to boost the development in IPs because the five objectives aim to deliver high levels of employment, productivity and social cohesion, which are directly linked to the challenges and opportunities identified for IPs. Each Member State has adopted its own national targets in each of these areas. Concrete actions at EU and national levels underpin the strategy.

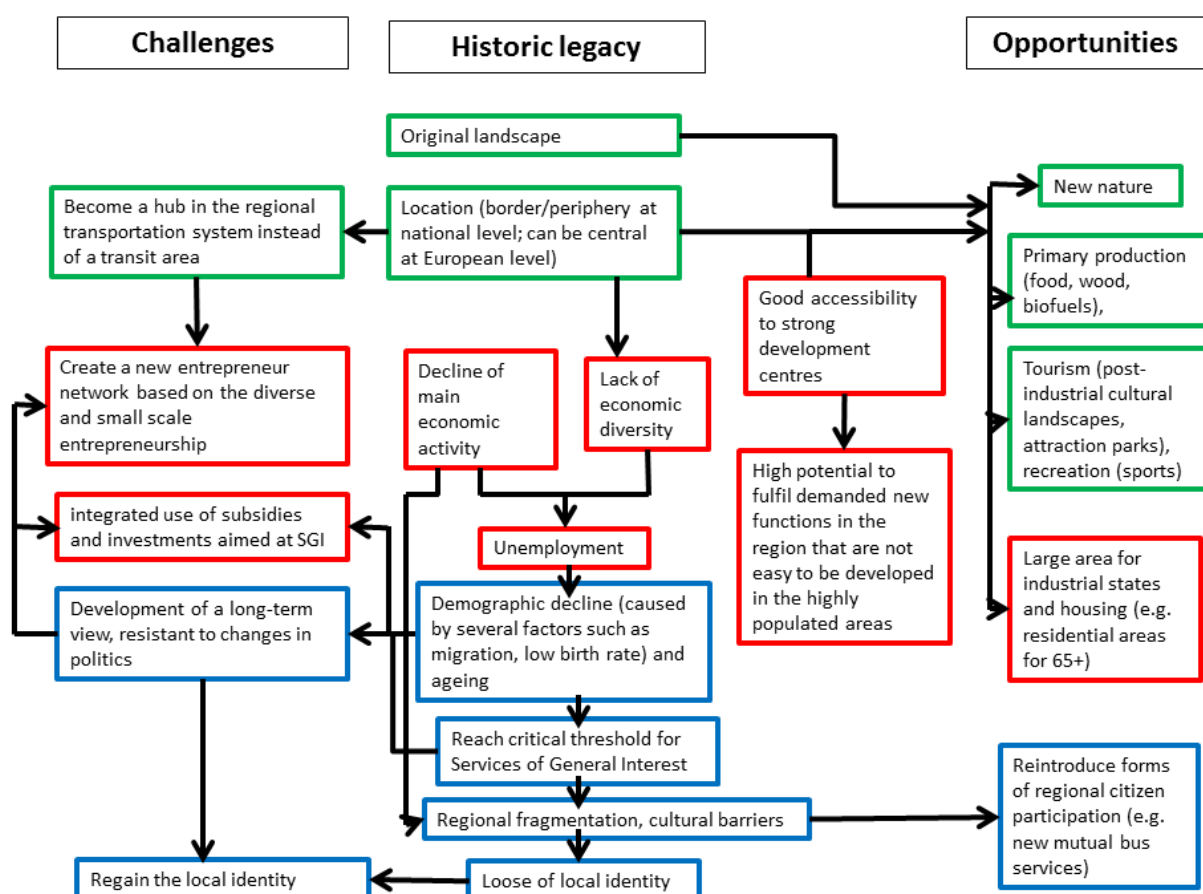


Figure 9 Nexus diagram for Inner peripheries

The nexus diagram shows linkages between the historic legacy of these kind of regions and the associated challenges and opportunities.

3.2.7 Outermost Regions: Conceptualisation and delineation

Article 349 of the Treaty of Lisbon lists nine Outermost Regions (OR) and presents the main determinants of this specific EU status. Following recent decisions, there are now only eight OR:

- 4 French Départements – Martinique, Guadeloupe, French Guiana (Guyane) and La Réunion
- 1 French “Collectivité” – Saint Martin
- 2 Portuguese Autonomous Regions – Madeira and the Azores (Açores)
- 1 Spanish Autonomous Community – the Canary Islands (Islas Canarias)

The territories of Saint Martin and Saint Barthélémy, once attached to Guadeloupe, are now separate entities. Saint Barthélémy recently changed its status and became part of the Overseas Countries and Territories (OCTs) following a decision of the European Council on 1st January 2012.

These territories are parts of the European Union, although situated in the Atlantic Ocean, the Caribbean Sea and the Indian Ocean as well as on the South American continent. Given their situations, the European Treaty officially acknowledges that these regions have to cope with specific constraints –remoteness, insularity, small (usable) area, difficult topography and climate, economic dependence on a few products – the permanence and combination of which severely restrain development capacities.

History and conceptualisation of Outermost Regions

a) Roots in national histories

All OR were discovered in the 15th century by European navigators. In the case of the Canary Islands, the Azores, Madeira, and La Réunion in the Indian Ocean, these discoveries were actually re-discoveries, since early Arabic, Nordic or Mediterranean explorers had visited these islands.

These French, Spanish and Portuguese territories (mostly archipelagos) were then colonised, mostly during the 16th century. In some cases, such

as La Réunion, the Azores or Madeira, the islands were uninhabited. The early settlers in the Azores came from many European nations – merchants, sugar cane growers, members of the clergy, and petty criminals – and also included Moorish prisoners and enslaved Africans. In La Réunion, the 20 first settlers arrived by boat from North-western France. They were progressively followed by others, but this early population was far less diverse than in the Azores. Other territories were previously inhabited, e.g., by Caribbean Indians in the West Indies or the Guanche people in the Canary Islands. These were variously fought, forced to emigrate, decimated by diseases imported from Europe, but also enslaved and sometimes deported to other colonies (as Guanches to Madeira).

In French Guiana, the many difficulties faced by early settlers – harsh climatic and cultivation conditions, difficult relationships with Indians – made the process difficult. Settlement campaigns based on the arrival of ‘voluntary’ workers bound by a three-year contract, and the deportation of political prisoners failed. These missing settlers were replaced by slaves.

In all these overseas territories, the new settlers imposed a specific economic model, based on the cultivation of one or a very limited number of crops. Martinique, Guadeloupe, the Canary Islands and Madeira became sugar economies from the 16th century. While their origins were different⁹¹ and can account for diverse later trajectories in terms of economic development, the structure of these four economies converged. In La Réunion, coffee was cultivated first. It was later (early 19th century) replaced by sugar cane because cyclones had caused severe damage to coffee crops, whereas sugar cane, given its growth cycles, was not sensitive to such events. La Réunion also became, at this time, the world’s main vanilla producer. In the Azores, although sugar cane was planted, the economy remained relatively diverse. The economy of French Guiana was less developed (mainly due to the lack of workers), concentrating on sugar, coffee, spices and chocolate. In Madeira, grapefruit and wine remained important, although much sugar cane was also planted. The economies of the French ORs peaked between the mid-1760s and the end of the 1780s, and began to decline after the French Revolution (1789).

In all territories, slaves were progressively imported to sustain the developing economies. In the Canary Islands, the enslaved native population rapidly declined and was replaced by African slaves. The process was eased by the fact that the Islands, as well as the Azores and

⁹¹ Noble French families and slaves were sent to the West Indies to grow sugar cane, whereas in the Canary Islands, techniques and processes of the sugar industry (sugar cane and sugar beet) were imported from the Mediterranean area by Sicilians and Genoese businessmen, while some cultivation tasks relied on Portuguese immigrant workers

Madeira, were a stop-over for slave boats sailing from Africa to the Spanish and Portuguese colonies. The number of slaves in Madeira is estimated to have reached 10% of the island's population in the 16th century. Slaves were also extensively used in Martinique and Guadeloupe, as well as La Réunion and French Guiana (although to a lesser extent in terms of number of people). In the Azores, the population of slaves remained low since the structure of the economy never specialised as much in intensive crops.

The 19th century marked a turning point in the history of these economies. Given their location and the chronology of discovery and settlement, the economies of the Spanish and Portuguese islands had developed early but soon faced stiff competition from other colonies when the latter expanded. Recession and the need for alternative sources of growth thus became obvious at the eve of the 19th century. For example, the Canary Islands turned towards cochineal to sustain their economy, whereas Madeira concentrated on wine.

In the French territories, the Revolution and the invasion of Martinique by England deeply shook the economic model. Although the complete abolition of slavery took a long time, the movement started during the Revolution, in the 1790s. Slave trade was forbidden in 1817 and slavery abolished in 1848. This put an end to a fundamental basis of the colonial economy, but not to the cultivation of sugar cane. Soon afterwards, this crop faced increasing competition from beet sugar produced in Europe. In French Guyana also, this period was a turning point: in addition to the abolition of slavery, gold was discovered in 1855 in the East of the territory. This was the beginning of a gold rush and the end of agricultural activities, due to the lack of available workers. In La Réunion, the crisis in the 1870s left many agricultural workers unemployed. In response, France implemented major public works projects, providing these workers with jobs. The strong employer role of public authorities (whether the National state or local authorities) remains a strong component of OR economies.

Madeira and the Azores were granted their autonomy in 1976, following the democratic revolution of 1974, and are the only two Portuguese "autonomous regions". In Spain, the Canary Islands gained their current status of Autonomous Community in 1982, after the establishment of a democratic constitutional democracy in Spain, and enjoy a higher degree of autonomy than most of the other 16 Spanish Autonomous Communities. In contrast, Martinique, Guadeloupe, French Guiana and La Réunion were granted the status of 'départements' in 1946, at the end of World War II. As such, they remain parts of the French territory, and laws

and rules apply equally over the whole territory. However, the 1958 French Constitution states that certain legal documents can be adapted to suit the characteristics of the OR facing specific constraints.

In all 7 ORs, the economic structure has followed comparable major trends: downturn of agricultural activities in terms of their contribution to GDP (but agriculture remains important as a traditional, cultural and environmental basis); increasing importance of services, especially tourism; and strong influence of the public sector (major employer). However, there are important disparities. In some OR, tourism, for example, represents over 30% of GDP (notably the Canary Islands), whereas it remains relatively low (Azores) or even residual (French Guiana) in others. Overall, it appears that ORs follow a trajectory that is influenced by their status of overseas territories, but that this common status is less strong than their economic ties with France, Spain or Portugal. The Canary Islands followed Spain's monetary policy in the 1980s and built a strong tourism sector partly on this basis. Free trade zones created in the Azores and Madeira constitute a strong economic asset for these two archipelagos. In the French Antilles and La Réunion, agricultural activities, such as sugar cane and banana plantations, have been strongly supported through policy choices. In French Guiana, the economy is driven by special activities since President De Gaulle decided to establish the National Centre for Spatial Studies there in the 1960s. In all four French ORs, the public sector is a particularly strong economic actor.

b) Recognition of a common, specific status in European treaties

The European Union started recognising "remoteness" as a concept during the 1980s, and thus progressively took account of the specific features of the concerned regions. The guidelines for this approach were set out in "Specific Orientation Programmes for Remoteness and Insularity" – POSEIDOM for the French overseas départements (1989), POSEICAN for the Canary Islands (1991) and POSEIMA for the Azores and Madeira (1991). Since 1989, cohesion policy has been mobilised to offset the economic and social disparities affecting these regions. They benefitted from an increased level of financial support from the Structural Funds and, for the Azores, Madeira and Canary Islands, from the Cohesion Fund.

In 1992, the specificities of the French ORs, the Canary Islands, Madeira and the Azores were detailed in the Declaration annexed to the Treaty of Maastricht. This recognition was confirmed in 1999 when article 227-2 of the EC Treaty was replaced by article 299-2 (Amsterdam Treaty). This

details the handicaps acknowledged as specific to the ORs, such as remoteness, insularity, small size of territories, difficult topography and climate, and economic dependence on a limited number of products. Given these handicaps, the article also explains how specific measures can be taken in order to determine the conditions in which the Treaty is applied to these regions, thereby opening the way for possible derogations and for OR status.

In March 2000, the European Commission published a report listing measures to be implemented in application of article 299-2⁹². In June 2002, the European Council of Seville invited the Commission to submit a report containing an overall and coherent assessment of the specific characteristics which affect the situation of the ORs. It also invited the Council and the Commission to press ahead with the implementation of the dedicated Article of the Treaty and to adopt suitable measures to take account of these regions' special needs. Accordingly, since 2004, the EU has developed and followed an integrated strategy, based on an active partnership between the EU institutions, national governments and the ORs.

The specific status of ORs and the associated integrated strategy were confirmed by the Treaty of Lisbon (article 349), which maintains the need for a specific treatment for these regions. Initially, the main priorities pursued were to improve accessibility, competitiveness and regional ties for the ORs. More recently, the Commission has been willing to foster local development in ways that benefit the EU as a whole. The aim is to generate wider interest in the regions and, hopefully, turn their handicaps into assets⁹³. For example, ORs have geographical and geological characteristics that make them excellent laboratories for research in a number of fields, including climate change, and have unique geostrategic locations. Their biodiversity and exceptional marine ecosystems hold great promise for innovation in pharmaceuticals and agronomy.

Although the ORs share many characteristics with all other overseas territories depending on EU Member States, the Treaties establish a clear-cut difference between ORs and Overseas Countries and Territories (OCTs). ORs are an integral part of the EU territory, whereas OCTs are part of their mainland country, but not of the EU. This difference is fundamental. Whereas EU law applies to OR territories (although with adjustments and derogations), it does not apply in OCTs. ORs benefit from EU regional policy as do all other EU regions, whereas the

⁹² *Commission report on the measures to implement Article 299(2) - the outermost regions of the European Union*, COM/2000/0147 final

⁹³ *The outermost regions: an asset for Europe (COM2008)*, Study of Biodiversity as a development factor for Outermost Regions of Europe. (BIODERUP - INTERREG IIIC 2007)

relationships between OCTs and the EU are organised through an association agreement, aiming to promote the economic and social development of these territories, and establish strong economic relationships with the EU.

Although EU law applies to the ORs, it is acknowledged that some handicaps weigh on these regions, justifying the need to take specific actions to cope with these handicaps and their effects.

EU laws apply in their totality, except for very few topics, mostly concerning tax and competition (European Commission, 2004 & 2007a). These derogations have been accepted by the European Commission because they constituted the continuation of specific advantages previously granted by the nation-states (France, Portugal, etc.). These derogations include specific indirect taxation (VAT rates, dock dues in the French ORs, Tax on Imports and Deliveries in the Canary Islands⁹⁴) as well as more a flexible regime for State aid and tax incentives. As regards environmental legislation, time-limited targeted derogations can be obtained on specific issues, such as waste and water management or quality standards of imported oil.

Several special treatments and compensation programmes favour the ORs. Although the GDP per capita of the Canary Islands and Madeira is now above 75% of the Community average, the two regions still benefit from additional funding during the 2007-2013 period. In addition, assistance rates from the Structural Funds have been increased to 85% for all ORs (regardless of their classification as convergence or competitiveness objectives regions). A specific additional ERDF allocation compensates for the handicaps and constraints of the ORs which cause additional production costs (e.g., transport, storage, maintenance). This allocation amounts to €35 per inhabitant per year (a total of €979 million) over the current programming period and comes on top of any funding for which these regions are otherwise eligible. However, this allocation is expected to roughly decrease over the next programming period.

The ORs benefit from specific instruments or conditions:

- Continued assistance from the compensation fund (POSEI Fishery) to counter the effects of additional costs which increase marketing costs for certain fishery products. The levels of funding have

⁹⁴ The Octroi de mer (translation 'dock dues') and the AIEM (Arbitrio sobre Importaciones y Entregas de Mercancías) apply to imported as well as to local products. Local authorities are allowed to grant local products tax exemptions or reductions, which creates taxation differentials between these products and imported ones. Tax differentials can only apply to a set list of products and must not exceed fixed proportions. This system was design to support local productions and help local economic actors face ORs' specific handicaps.

remained unchanged, but funds are granted in a more flexible manner;

- Continued support to agricultural activities through the reformed POSEI (the legislative proposal was adopted by the Council on 30 January 2006);
- Special treatment through the European Agricultural Fund for Rural Development (EAFRD): access to specific rates of assistance.

The Community framework for the sugar sector provides the ORs with compensation for loss of income caused by falls in sugar reference prices and continue financial support for the sale of raw sugar to the mainland (€15 million).

See Annex 23 for a detailed list of policy documents and strategies dedicated to the ORs.

c) Evolution of the European overseas territories: status changes

As mentioned above, OR status is a geographic specificity that has appeared as a result of a political process, through which territories that are geographically disjoint from the European continent have been designated as fully-fledged components of the EU. Accessing this status or abandoning it thus requires validation at the EU level. The Treaty of Lisbon has simplified the process for status change: a unanimous decision of the European Council is now sufficient to modify the list of ORs. The change in Saint Barthélemy's status was voted in this way. Saint Martin and Saint Barthélemy obtained their separation from Guadeloupe a few years ago. Whereas Saint Martin has been willing to remain an OR on its own, Saint Barthélemy requested a status change to become part of the Overseas Countries and Territories. The European Council voted in favour on 1 January 2012.

Before the Treaty of Lisbon was adopted, any territory with a French Overseas Département (DOM) status was also an OR. Indeed, the list of Outermost Regions detailed under article 299-2 comprised "the French DOM". In the new treaty, French ORs are named one by one, with no mention of their national status. As a result, a DOM can no longer be automatically considered as an OR. In addition, a new status for French overseas territories was created recently, the "Collectivité", that grants more legal autonomy than the "Département". As exemplified by the case of Saint Martin, Collectivités can become ORs, as long as they do not use their autonomy to adopt legislations that are contrary to EU law

Being part of the EU territory and enforcing EU law may require great efforts, notably in fields such as environmental and security. Some territories consider this as too much of a burden, even in comparison with the related advantages. However, for some others, access to the full range of EU funding instruments (particularly Structural Funds), as well as to the specific compensatory instruments dedicated to the ORs, are a strong incentive to keep their OR status or, if relevant, to evolve towards OR status.

Mayotte recently became a DOM and now wishes to become an OR. As mentioned above, previously, accession to DOM status would have granted Mayotte OR status automatically. Today, this would have to be validated by the European Council. Some islands in the Netherlands Antilles (Bonaire, St Eustatius and Saba) may also opt for the OR option within a few years, although others (Curaçao, Aruba and Saint Maarten) have confirmed they would not.

Geographic specificities: handicaps and assets

a) From political determination to geographic approach

Section A shows how political the definition of OR actually is. The current group of ORs was not created on the basis of geographic specificities. The status as an OR depends on this region's (as well as on the State's) vision of what the territory's position should be within the EU. It is only once this initial choice is made that geography and specificity start to matter. Indeed, it is clear that ORs collectively share at least a certain number of characteristics that are strong contextual elements for them, and to which the Treaty directly or indirectly refers. ORs are, first, remote from continental EU. Besides, as noted by Planistat Europe & Bradley Dunbar (2003)⁹⁵, these territories are all both insular and mountainous, except for French Guiana, which can be characterised as sparsely populated. In addition to these specificities, it is important to consider other geographical factors, which are very informative for these regions and sometimes unique at the European level. Table 14 summarises the specific geographical constraints that best describe the ORs:

⁹⁵ Planistat Europe & Bradley Dunbar Associates. 2003. *Analysis of insular and Outermost regions of the European Union*. Final report to the European Commission, Contract n°2000.CE.16.0.AT.118.

Table 14 Geographical constraints of Outermost Regions

Regions	Remoteness	Insularity	Double insularity	Small territory	Complex territorial morphology	Specific climatic conditions	Natural risk
Azores	X	X	X	X	X	X	X
Canary Islands	X	X	X	X	X	X	X
Guadeloupe	X	X	X	X	X	X	X
French Guiana	X			X	X	X	
Madeira	X	X	X	X	X	X	X
Martinique	X	X		X	X	X	X
La Réunion	X	X		X	X	X	X
Saint Martin	X	X	X	X	X	X	X

ORs have strong common determinants. Except for double insularity, which concerns only some regions, all other geographic specificities are shared by almost all ORs. The case of French Guiana is specific because it is not an island, and is very large. However, it is almost completely covered by the Amazonian forest: the main inhabited area (the coastal region) is thus an enclave with reduced contact to neighbouring territories, which could arguably be compared to an island.

b) Geographic specificities and related handicaps

Remoteness is a key feature of these regions, as they are distant from their respective Member States and thus from the European continent. Some are even isolated within their own regional environment (Table 15).

Table 15 Characteristics of remoteness of Outermost Regions

Regions	Distance from the capital of the Member State	Time difference (summer / Winter)	Distance from the nearest continent (km)
Azores	1500	- 1 hour	1 450 (Africa - Morocco)
Canary Islands	2000	- 1 hour	250 (Africa - Morocco)
Guadeloupe	6800	- 6 / - 5 hours	620 (South America - Venezuela)
French Guiana	7500	- 5 / - 4 hours	N/A
Madeira	1000	N/A	650 (Africa - Morocco)
Martinique	6850	- 6 / - 5 hours	450 (South America - Venezuela)
La Réunion	9400	+ 2 / + 3 hours	1 700 (Africa - Mozambique)
Saint Martin	6800	- 6 / - 5 hours	620 (South America - Venezuela)

Given their status, these regions have strong and frequent relationships of several kinds with their Member States as well as with the EU. Remoteness represents a handicap in terms of accessibility, both technically and financially.

Except for French Guiana, all ORs are islands. Four are archipelagos: the Canary Islands, the Azores, Madeira and Guadeloupe. The Azores are composed of nine islands extending over 650 km. The Canary Islands are composed of 13 islands, of which 7 are inhabited, extending 460. As for Guadeloupe, composed of two islands (Grande Terre and Basse Terre), several islands or groups of islands are administratively attached to it: la Désirade, Marie-Galante, les Saintes. Saint Martin and Saint Barthélémy, previously attached to Guadeloupe, are now separate administrative entities. Madeira is composed of two main inhabited islands, administered together with (but separately from) the uninhabited Desertas and Selvagem archipelagos.

Insularity can be considered as another dimension in remoteness. It necessarily brings accessibility and transportation issues, and various types of constraints as regards resources (e.g., energy water generation and storage/use, waste management). Double insularity makes these issues even more acute, and creates additional ones: internal accessibility issues must be addressed (by boat or air, which is more expensive); it is often necessary to duplicate infrastructures (e.g., for health or education); and it is also expensive to maintain several small structures. What is true for public infrastructures is equally true for private ones, and represents a burden for the development of economic activities (notably industrial activities).

Most ORs are relatively small in terms of area: less than 3,000 km² in average, if French Guiana is not considered. In some cases, this area is far smaller (801 km² for Madeira), if not extremely small (53 km² for Saint Martin). French Guiana is an exception, since it has an area of almost 85,000 km². However, 96% of this is covered by an extremely dense (and mostly protected) tropical forest, which reduces the land available for urban or even agricultural human settlement and economic activities. As most of the population is condensed on the coastal area, it is arguable that French Guiana is effectively also a small territory. Equally, the populations of all ORs are quite small, though it should also be noted that the population of the Canary Islands, in particular, is larger than some EU Member States (Table 16).

Table 16 Area and population of Outermost Regions

Regions	Area	Number of inhabitants	Date of census
Azores	2,346 km ²	246,646	2011
Canary Islands	7,493 km ²	2,117,519	2011
Guadeloupe	1,628 km ²	401,554	2009
French Guiana	83,846 km ²	232,223	2010
Madeira	801 km ²	267,302	2011
Martinique	1,128 km ²	396,404	2009
La Réunion	2,512 km ²	816,364	2009
Saint Martin	53 km ²	35,692	2009

This factor, combined with insularity (except for French Guiana), or even double insularity, and remoteness, has major impacts. One key consequence is that their economic market is extremely limited, and that they depend strongly on imported products.

All insular ORs are of more or less recent volcanic origin. Most have a rugged topography, and some have very high summits (the Piton des Neiges, 3,070 m, in La Réunion; Mount Teide, 3,718 m, in the Canary Islands). As a consequence, access to certain parts of these already isolated and insular territories is especially difficult. This creates some additional issues, notably in terms of providing the concerned populations with public services. Although the situation in French Guiana is different, the result is the same: as mentioned above, over 90% of its area is covered by tropical forest. Although these areas are very sparsely populated, it remains necessary to provide their inhabitants with at least minimum services. Protected areas (national parks, reserves, etc.) cover a large proportion of the area of all ORs, limiting the land available for cultivation, industrial activities and human settlement. This can be considered as a handicap in terms of developing certain economic activities, and is certainly a challenge in terms of resource and waste management.

As most of the ORs are in the wet intertropical zone, they generally have warm and wet climates, and some are also subject to particular climatic phenomena: heavy and violent rains, persistent fog, violent wind, salty wind. Because of their insular and mountainous characteristics, they experience very strong spatio-temporal variations. Certain sub-regions experience drought and are regularly threatened by forest fires (especially with strong winds).

Most of the ORs are strongly exposed to natural risks and vulnerabilities, which regularly provoke important damages and impose continuous attention. These risks are:

- Tropical storm risks and coastal risks bounded to the passage of cyclones (storm tides and cyclonic swells, floods),
- Volcanic hazards,
- Seismic risks of landslides and tidal waves,
- Risks of erosion and floods.

Due to its geographic position and specificities, French Guiana is less vulnerable to these natural hazards. However, the local authorities have implemented risk management plans in order to anticipate erosion-related landslides and floods. In addition to these occasional risks, climatic characteristics create some daily technical difficulties in all ORs: due to

the wet and salty climate, the life expectancy of machines (both industrial machinery and private vehicles) is reduced, and it is necessary to use specifically resistant (and thus expensive) materials for buildings.

Conclusion

The group of ORs was constructed according to political criteria. Their initial coherence is founded on a shared vision of the role these regions are willing to play beside their homeland country within the EU. This is what distinguishes ORs from Overseas Countries and Territories, whose geographical characteristics are very often similar. Similarly, cohesion within this political group is far more reinforced by the existence of common, specifically designed, policies than by the fact of sharing certain geographical characteristics.

However, European institutions need to take into account the geographical characteristics of its different ORs when designing policies to promote a balanced and sustainable development in these areas. Although ORs are certainly not strictly comparable with one another, they share an important number of structuring elements, the combination of which effectively makes them different from all other continental EU territories. It is thus arguable that closely examining these characteristics and their impacts is essential to better understand how these regions are structured and how they cope with their respective and/or common challenges, and to determine how they can best be supported.

3.3 Cross-analysis of delineations

The delineation of geographically specificities has been an extensive and crucial step for the TPG to consider the demographic, economic and environmental characterisation of these territorial specificities. This chapter has two objectives: to briefly summarise basic information on area and population resulting from the respective delineations; and to analyse how GEOSPECS areas overlap in ESPON space and in the EU.

Synthesis of delineations at EU27 and ESPON space levels

As indicated in section 1.1, the delineation of various geographic specificities is based three types of definition principles:

- “Given” either geographically or politically: Outermost Regions and islands;
- “Based on threshold” values: mountain (morphological) and sparsely populated (demographical) regions;
- “Based on driving time-distances” to a line: coastal and border regions.

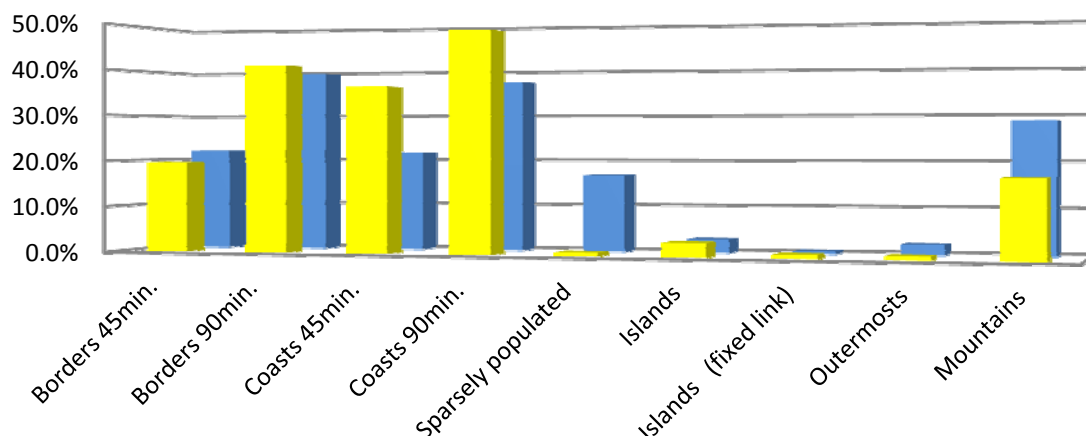
The TPG has chosen not to make a general delineation of border areas and coastal zones, considering that these are defined on the basis of different types of proximity (socio-economic, environmental etc.) to a borderline or a coastline. Admittedly, in its analyses, the TPG has mainly considered areas within 45 and 90 minutes travel time from to a borderline or a coastline. However, these thresholds do not cover all types of border and coast effects; differences in wealth and legislation between neighbouring countries can, for example, have an effect on national economies as a whole. ‘Border area’ is therefore a complex notion, analysed in detail in section 3.2.5.

As shown in Figure 10 (EU27) and Figure 11 (ESPON space⁹⁶), the relative importance of GEOSPECS specificities varies depending on whether the one considers their spatial extent or their population.

Considering their spatial extent, mountain areas occupy the largest share of EU27 territory (see Figure 10) with 28.7% of the area. Next come areas within 45 minutes from borders and coasts, with about 22% of the EU 27 territory, while sparsely populated areas total 16.7%. There is a major difference between these four largest categories, and the three other

⁹⁶ Excepting “the Former Yugoslav Republic of Macedonia” and “Bosnia and Herzegovina” where no LAU1 or LAU2 digital maps were available, making delineation process impossible.

ones. Islands without a fixed link total only 2.9% of the EU27 area, Outermost Regions 2.3%, and islands with a fixed link 0.6%.



The sum of percentages may exceed 100% due to the fact that many specificities overlap (see section on cross-delineations)

	Borders 45min.	Borders 90min.	Coasts 45min.	Coasts 90min.	Sparsely populated	Islands	Islands (fixed link)	Outermosts	Mountains
■ UE27 (Pop)	19.5%	40.7%	36.0%	47.9%	0.8%	3.1%	0.9%	0.8%	16.9%
■ UE27 (Area)	22.0%	39.4%	21.6%	37.3%	16.7%	2.9%	0.6%	2.3%	28.7%

Figure 10 Proportion of population and area covered by various types of geographic specificities (EU27)

Another way to interpret the relative importance of various specificities consists of taking account of the proportion of the EU27 population that lives within each GEOSPECS category. From this perspective, areas with 45 minutes from the coastline host the largest share of the EU27 population (36%), followed by areas within the same distance from borders (19.5%) and mountain areas (16.9%).

An alternative classification of GEOSPECS categories can be made on the basis of the ratio between the proportions of area and population. On one hand, there are geographic specificities where the population tends to “concentrate” (coasts, borders and islands) and, on the other, geographic specificities that tend to be more thinly populated than the European average (SPAs and, to a lesser extent, mountains). Outermost Regions are in a contrasting position, as they include both relatively densely populated islands and the sparsely populated rainforest of French Guiana.

The overall patterns are similar when one considers the ESPON space as a whole (see Figure 11). Nonetheless, some significant changes can be

observed in the relative importance of the mountain, sparsely populated and island categories, reflecting patterns of geographic specificity in ESPON countries not belonging to the European Union.

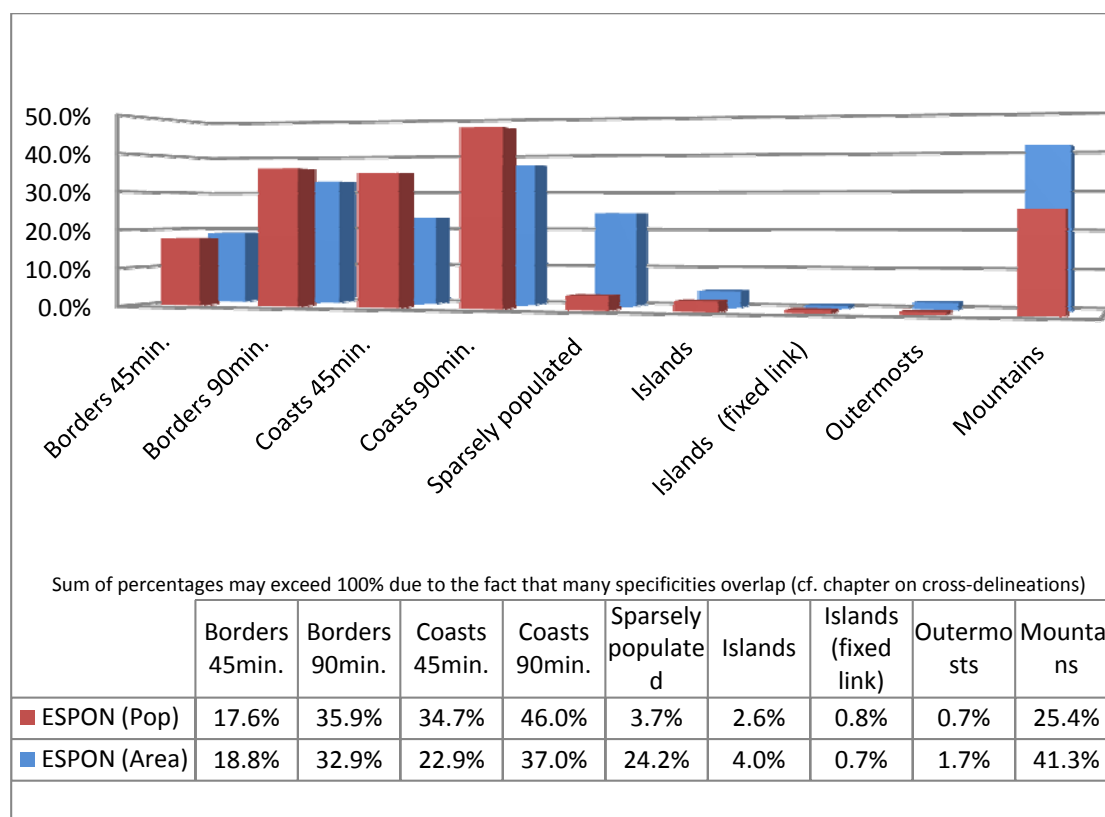


Figure 11 Population and area within various types of geographic specificities (ESPON space)

As shown in section 3.2.3, major parts of Iceland, Norway and Turkey comprise sparsely populated or poorly connected municipalities⁹⁷. Similarly, for mountains, (see section 3.2.1) Switzerland, Liechtenstein, Iceland, Norway, Western Balkans and Turkey all have a particularly high proportion of mountain areas⁹⁸. The proportion of mountainous areas therefore rises from 28% in the EU27 to 41% when considering the entire ESPON area.

Regarding islands in general, the fact that the share of area is more than one-third higher in the ESPON space than in the EU, while the share of population is 15% lower is mainly due to the inclusion of Iceland and, to a lesser extent, of the relatively sparsely populated islands of Norway. In

⁹⁷ IS : 72'814 habitants & 94'715 km²; NO : 1'050'784 habitants & 256'014 km²; TR : 16'709'234 habitants & 326'202km²

⁹⁸ AL: 23'291 KM² & 2'050'514 habitants; CH: 38'234 km² & 6'501'651 habitants; IS: 86'810 km² & 68'384 habitants; LI: 160 km² & 35'168 habitants; ME: 13'089 km² & 670'734 habitants; NO: 267'466 km² & 2'655'169 habitants, RS: 38'462 km² & 3'986'789 habitants; TR: 643'988 km² & 48'308'333 habitants; XK: 10'903 km² & 2'337'024 habitants.

parallel, the relative weight of the Turkish population in the ESPON space and the limited population of Turkish islands contribute to reduce the relative share of island population.

Comparison of GEOSPECS delimitation with ESPON typologies

As mentioned in section 1.2, the TPG has sought to maximise congruence with ESPON typologies, but it has nonetheless been necessary to adopt significantly different methods to create meaningful delineations for the analysis of development opportunities and challenges. The comparison of the delineations of GEOSPECS categories at the LAU2 level in GEOSPECS with the NUTS 3 typologies of ESPON provides information on the impact of these methodological differences on the number of persons and areas identified as geographically specific. It should also be noted that the GEOSPECS project's delineations include Turkey as well as most of the Western Balkans⁹⁹, which the ESPON typologies only covered these for border areas and SPAs.

In the case of border regions, the maps 1, 2, 7 and 8 of Annex A show the differences between a political/administrative and a geographical approach to the same specificity. The ESPON typology, for example, identified coastal NUTS3 regions participating in cross-border cooperation programs around the Baltic Sea, the English Channel, and the Mediterranean Sea as border regions. The extent to which the socio-economic dynamics in these maritime border areas can be compared to those observed along terrestrial borders can be questioned. Considering terrestrial border areas, the areas within 90 minutes of the border lines (Annex A, Map 2) fit more closely the border cooperation areas identified by the ESPON typology than the areas within 45 minutes (Annex A, Map 1), illustrating that border cooperation extends beyond areas of daily mobility to a border. However, maps representing the proportion of population that lives within 45 minutes of the border (Annex A, Map 7) are more informative when it comes to identifying areas where being close to a border is a major component of regional life and identity. This mainly concerns border areas in a central part of Europe, stretching from the Benelux countries to Romania, as well as Northern Ireland.

Coastal regions have been delineated on the basis of the proportion of population within 10 km from the coast in the ESPON typology, while GEOSPECS has considered different time-distances to the coast. The ESPON typology was subdivided in four classes (low, medium, high and very high share of coastal population). With regard to the daily mobility

⁹⁹ Excepting "the Former Yugoslav Republic of Macedonia" and "Bosnia and Herzegovina" where no Lau1 or Lau2 digital maps were available, making delineation process impossible

maximum travel time of 45 minutes, there are major variations within the classes with “low” and “medium” shares of coastal populations, as the proportions of population living in LAU2 within 45 minutes from the coast range from respectively 0.4% and 20.4% to 100% (Figure 12). This is an effect of the variable quality of transportation networks connecting the coast and the inland. Interestingly, the non-coastal regions identified in the ESPON typology also contains 35 NUTS 3 regions where more than 80% of the population is within commuting distance of the coast. These regions are all in the United Kingdom, the Netherlands, Belgium and Germany.

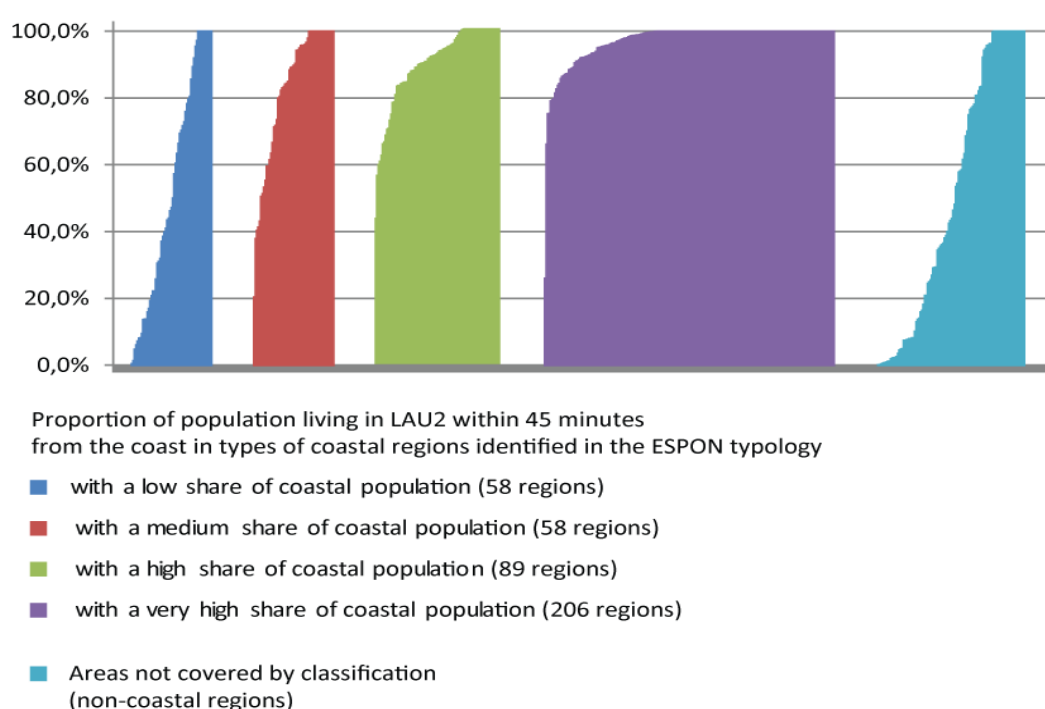


Figure 12 Proportions of population living in LAU2 within 45 minutes from the coast in the four classes of coastal regions of the ESPON typology

The mountain delineation of GEOSPECS includes Turkey, the Western Balkans, Reunion and Iceland, which are missing in the ESPON typology (Annex A, Map 5; Annex A, Map 12). The two delineations are methodologically similar, as they are based on very similar grids of mountain areas. However, these are applied at different levels (LAU2 and NUTS3, respectively). This explains why the patterns are relatively similar when considering the proportions of mountainous area and population at NUTS3 level (Annex A, Map 5; Annex A, Map 12). The comparison between these maps of proportions of mountain population and area makes the distinction between regions with populated mountains (e.g.

Alps, Apennines, Massif Central) and with populated piedmonts (e.g. Pyrenees). It appears important to maintain this distinction in the analyses, as the social and economic realities of regional "mountainousness" will be significantly different in each group of regions.

Attempts to map SPAs at the NUTS3 level makes the limitations of this scale of analysis obvious. Most "archipelagos of sparsity" (see section 3.2.3) disappear, e.g. along the Irish coast and the Portuguese-Spanish border, as well as in the Pyrenees, the Alps, Bulgaria, and the Baltic countries. In the Nordic countries, comparing the share of population (Annex A, Map 11) and area (Annex A, Map 6) in SPAs at the NUTS 3 level shows the different degrees of intra-regional disparity. While most of the territory of Norrbotten and Västerbotten in Northernmost Sweden has been defined as SPA in GEOSPECS, the proportion of the population living in these LAU2 units is very low.

Overall, these comparisons demonstrate the need for multi-scalar analyses to understand patterns of geographic specificity.

Cross-analysis of delineations

A major difficulty that arises when trying to assess whether a geographical specificity is associated with particular sets of development potentials or limitations is that several specificities often overlap over the same region.

Due to the large number of potential overlaps - 49 if one includes areas within commuting distance of urban areas - the TPG has mainly focused on overlaps that are most likely to reinforce or reduce development constraints in GEOSPECS areas (see Figure 13).

Mountains have been considered by the TPG as one of the most relevant categories for cross-delineations. Indeed, mountain massifs act as barriers that have often influenced the geographic context for social and economic development in all other categories, e.g. through additional infrastructure costs. The rough terrain of mountainous coasts, for instance, generally makes them less suitable for human settlement and use. Similar effects can be observed on islands, Outermost Regions and in sparsely populated areas. Mountains also reinforce border effects by adding topographic barriers to administrative ones. Finally, rough terrain limits the range of potential daily commuting distances to urban areas.

In contrast, accessibility to urban areas favours development potentials within all kind of territories. It is of particular relevance in geographic specificities where settlement patterns tend to be sparse, such as

	Border areas	Coastal zones	Mountain areas	Islands	Sparsely populated areas	Outermost regions	Access to urban areas
Border areas							
Coastal zones							
Mountain areas							
Islands							
Sparsely populated areas							
Outermost regions							
Access to urban areas							

Figure 13 Identification of most relevant overlapping categories

mountain areas and islands (see Figure 11). Indeed, urban areas act to concentrate demographic and economic activities upon which regional development strategies can build. Based on this rationale, one could think of the importance of PUSH for SPAs. This cross-delineation is, however, of no relevance because, using a threshold of FUA over 100,000, no such PUSH can be found in SPA. In the case of coastal zones, this tends to concentrate a large proportion of the population on small areas: PUSH (especially those over 750,000) represents precisely the backbone of this concentration process. In most cases, they do not only imply concentrations of people, goods and economic activities, but also act as interfaces with the global economy, hosting major harbours. Their role is therefore of particular relevance not only for the coastal zone itself, but for entire national economies.

Finally, crossing coastal zones with SPAs provides an interesting and complementary perspective on coasts. Indeed, this geographic specificity is, overall, characterised by the highest ratio of population to area (see Figure 11) among GEOSPECS categories. In that sense, looking at the less populated parts of coastal zones provides the TPG with useful elements on factors of attractiveness for the category.

Table 17 Overlaps between GEOSPECS categories (areas)

ESPON_Area	Border area (within 45 minutes)	Border area (within 90 minutes)	Coastal area (within 45 minutes)	Coastal area (within 90 minutes)	Sparsely populated and PC areas	Island without fixed link	Island with fixed link	Outermost region	Mountain area	Urban area > 100 000 inh.	Urban area > 750 000 inh.
Border area (within 45 minutes)		100.0%	10.9%	20.5%	38.6%		0.1%	4.7%	31.6%	34.2%	11.5%
Border area (within 90 minutes)	57.1%		13.0%	23.5%	25.5%		0.4%	3.3%	29.9%	40.4%	13.9%
Coastal area (within 45 minutes)	8.9%	18.6%		100.0%	26.8%	14.6%	2.9%	3.6%	38.3%	40.8%	13.2%
Coastal area (within 90 minutes)	10.4%	20.8%	61.9%		21.5%	10.8%	1.8%	2.3%	38.6%	39.5%	12.7%
Sparsely populated and PC areas	29.9%	34.6%	25.4%	32.9%		7.0%	1.0%	5.9%	55.9%	0.2%	0.0%
Island without fixed link			82.7%	99.0%	42.3%			6.7%	71.9%	16.7%	3.0%
Island with fixed link	3.8%	17.5%	100.0%	100.0%	34.6%				39.9%	23.3%	15.0%
Outermost region	51.2%	62.8%	48.8%	48.8%	83.8%	15.9%			12.2%	0.6%	
Mountain area	14.4%	23.8%	21.3%	34.6%	32.9%	7.0%	0.6%	0.5%		17.6%	3.7%
Urban area > 100 000 habitants	18.3%	37.9%	26.7%	41.7%		1.9%	0.4%	0.0%	20.8%		30.4%
Urban area > 750 000 habitants	20.3%	42.9%	28.4%	44.0%		1.1%	0.9%	14.1%	14.1%	100.0%	

The table reads as follows (using the figures in red font colour as examples):

- Within border areas (1st row), 10,9% of the area is also a coastal area (3rd column)
- Within coastal areas (3rd line), 8,9% of the area is also a border area (1st row)

Table 18 Overlaps between GEOSPECS categories (population)

ESPO _N _Population	Border area (within 45 minutes)	Border area (within 90 minutes)	Coastal area (within 45 minutes)	Coastal area (within 90 minutes)	Sparsely populated and PC areas	Island without fixed link	Island with fixed link	Outermost region	Mountain area	Urban area > 100 000 inh.	Urban area > 750 000 inh.
Border area (within 45 minutes)		100.0%	14.8%	25.6%	0.9%		1.4%	0.1%	22.1%	84.7%	48.1%
Border area (within 90 minutes)	49.1%		17.7%	26.9%	0.7%		1.2%	0.0%	19.3%	84.8%	51.9%
Coastal area (within 45 minutes)	7.5%	18.3%		100.0%	1.9%	7.1%	2.3%	1.9%	17.5%	77.5%	46.5%
Coastal area (within 90 minutes)	9.8%	21.0%	75.3%		1.6%	5.7%	1.7%	1.5%	19.9%	76.7%	45.6%
Sparsely populated and PC areas	4.4%	6.9%	18.0%	20.5%		0.9%	0.9%	0.9%	77.0%	0.3%	0.0%
Island without fixed link			94.2%	99.3%	1.2%			25.3%	54.5%	56.7%	16.7%
Island with fixed link	31.2%	53.2%	100.0%	100.0%	4.1%				6.2%	73.1%	53.6%
Outermost region	1.5%	1.5%	96.5%	96.5%	4.8%	95.1%			75.2%	23.3%	
Mountain area	15.4%	27.2%	23.8%	36.1%	11.1%	5.6%	0.2%	2.1%		42.7%	17.0%
Urban area > 100 000 inhabitants	20.6%	41.9%	37.0%	48.6%		2.1%	0.8%	0.2%	14.9%		58.4%
Urban area > 750 000 inhabitants	20.0%	44.0%	38.0%	49.5%		1.0%	1.0%	10.2%	10.2%	100.0%	

The table reads as follows (using the figures in red font colour as examples):

- Within border areas (1st line), 14,8% of the population lives in a coastal area (3rd column)
- Within coastal areas (3rd line), 7,5% of the population lives in a border area (1st column)

4. Quantitative analyses

4.1 Quantitative characterisation of areas with geographic specificities

4.1.1 Mountain areas

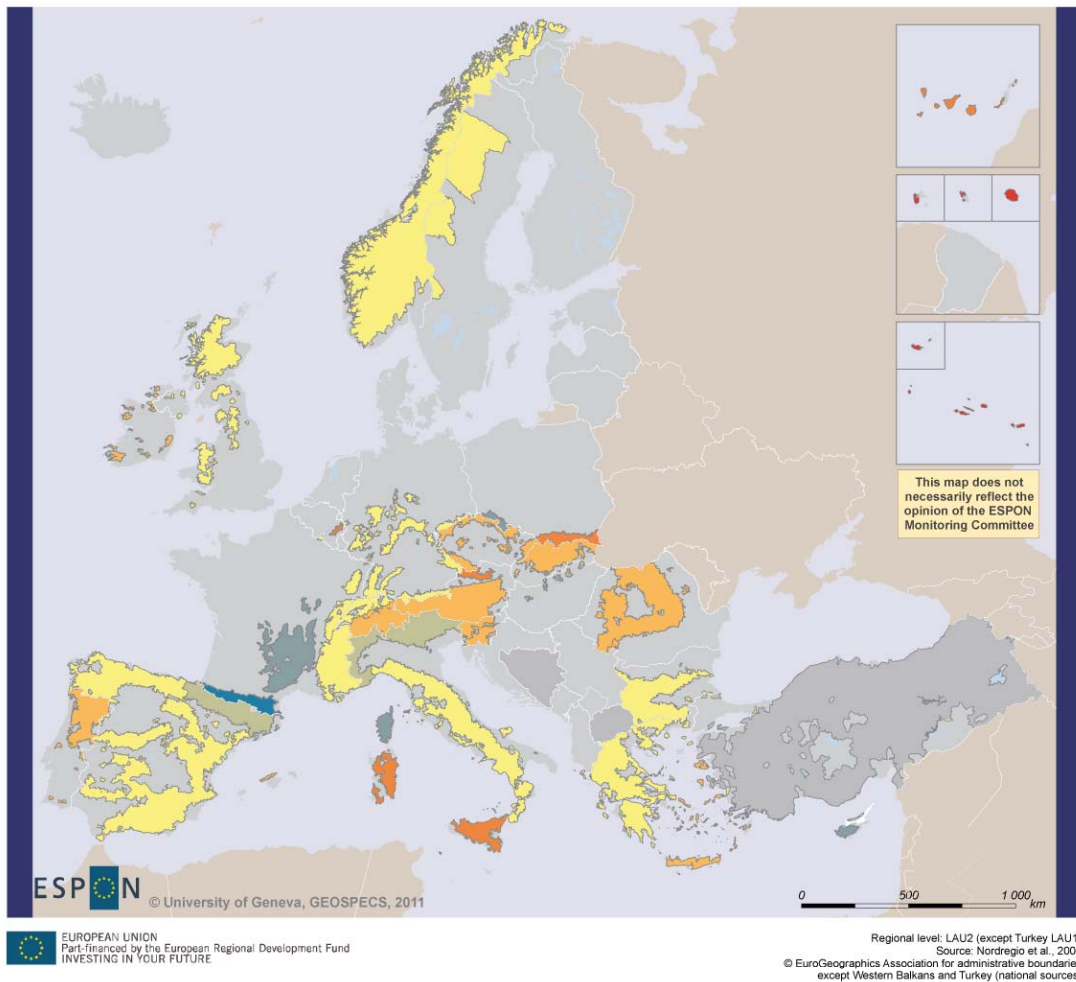
In 2010, the European Environment Agency published a report on Europe's mountains (EEA, 2010). This report covered the ESPON space, using a delineation of mountains that is very similar to the one used for Geospecs, and included analyses at a high spatial resolution (mainly 1 km²). Accordingly, this section will not present quantitative analyses on themes that have already been covered in the EEA report at a comparable spatial resolution and based on recent data, such as population, land covers and the distribution of protected areas; the comprehensive analyses on these themes in the EEA report can be regarded as complementary to what is presented below.

Population: Age structure

While the EEA (2010) report presents data on population number and density, and changes in these, it does not present data on age structure, though such data were presented in European Commission (2004).

With regard to persons under 15, analysis at the level of national massifs (Map 28) suggests particularly low proportions compared to national averages in three French mountain areas (Pyrenees, Corsica, Massif Central: proportions respectively 14, 15, 16% compared to the national average of 18%), the Polish middle mountains (17% vs. 20%) and Cyprus (19 vs. 21%). In contrast, the most significant differences from national averages are positive, again for France, in mountains of the Indian Ocean and Caribbean islands (27, 23 vs. 18%). Other particularly high proportions are in Portuguese Atlantic Islands (20 vs. 16%), the Polish Carpathians (23 vs. 20%), Sardinia and Sicily (17 vs. 14%). At the LAU2 scale (Map 29), only some similar relationships are apparent; the diversity of situations within each country and massif tends to predominate. Nevertheless, particularly low proportions are generally found for most of the French Pyrenees, Corsica, and Massif Central; and particularly high proportions for the mountains of the Outermost Regions and the Polish Carpathians. However, other patterns also appear. In Spain, there is quite a clear differentiation between the mountains of the north and east,

Proportion of children in mountain areas



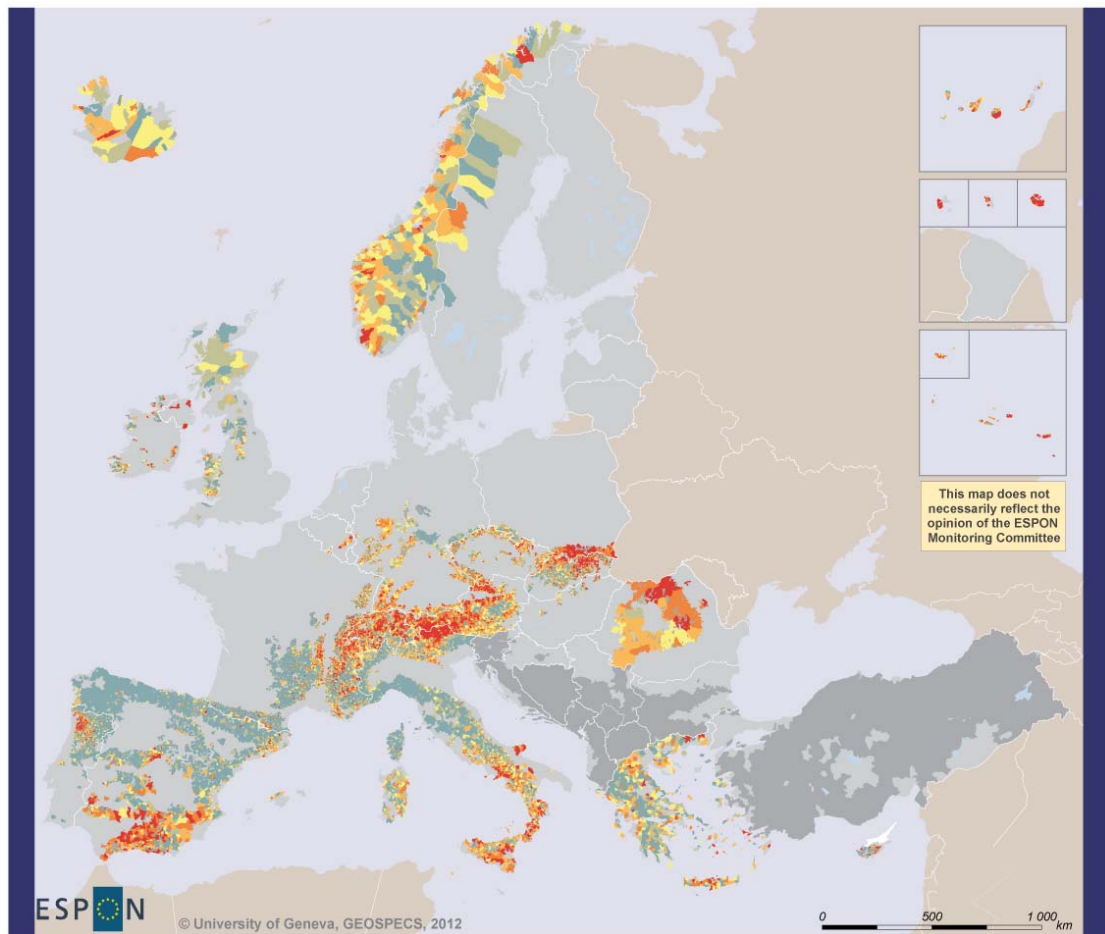
Difference between proportion of children in mountain massifs and national average

In percentage points



Map 28 Proportion of children in mountain massifs

Proportion of children in mountain areas



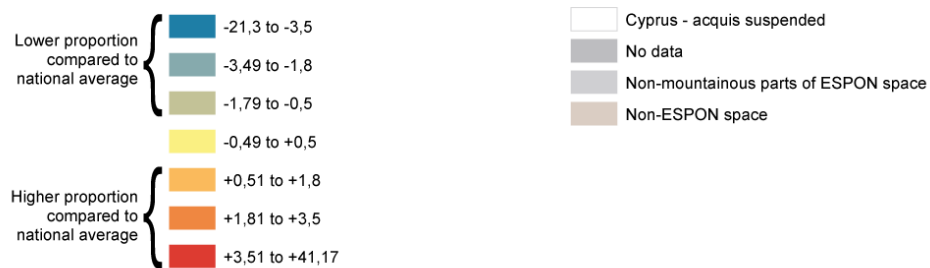
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Regional level: LAU2 (except Turkey LAU1)
 Source: GEOSPECS, 2011
 © EuroGeographics Association for administrative boundaries
 except Western Balkans and Turkey (national sources)

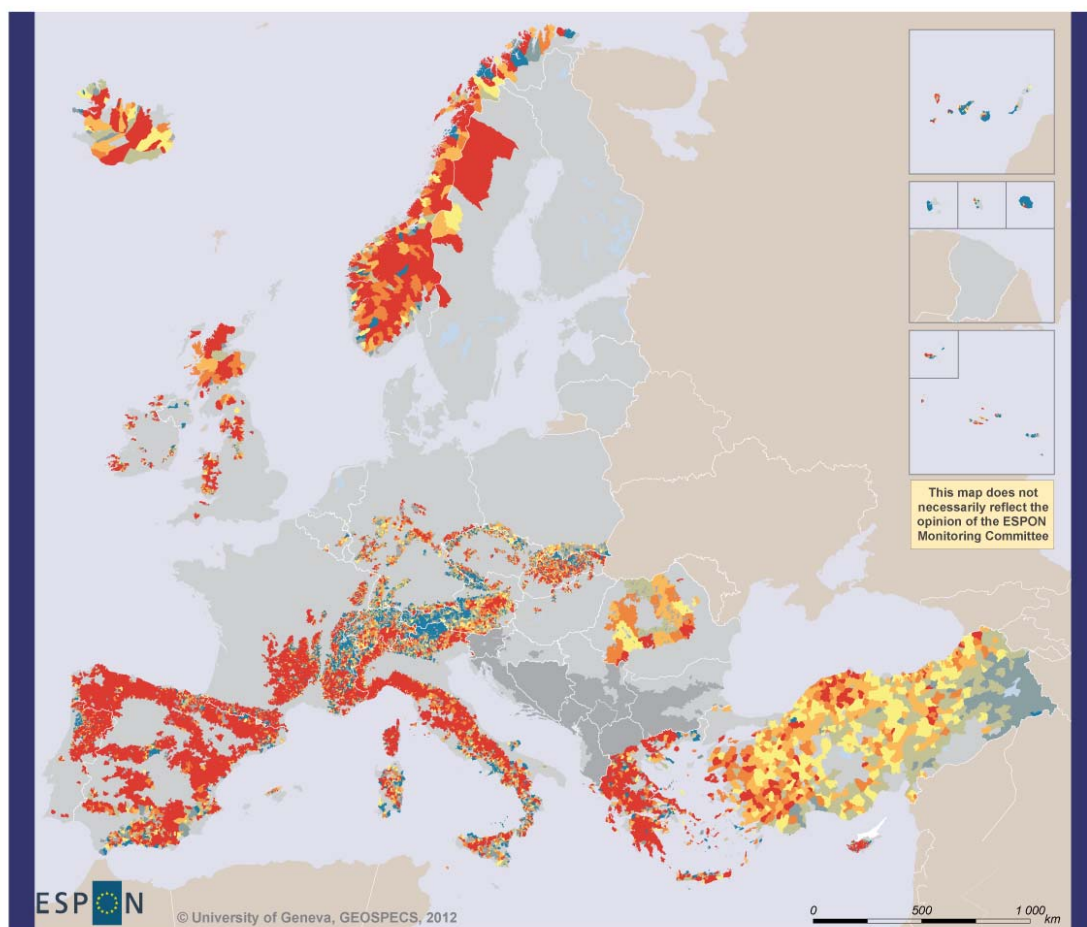
Difference between proportion of mountain LAU2 inhabitants under 15 years old and national average

In percentage points



Map 29 Proportion of children in mountain municipalities

Proportion of persons over 59 y.o. in mountain areas



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Regional level: LAU2 (except Turkey LAU1)
Source: Nordregio et al., 2004
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except Western Balkans and Turkey (national sources)

Difference between proportion of mountain massif inhabitants over 59 years old and national average

In percentage points



Table 19 Proportion of persons over 59 y.o. in mountain municipalities

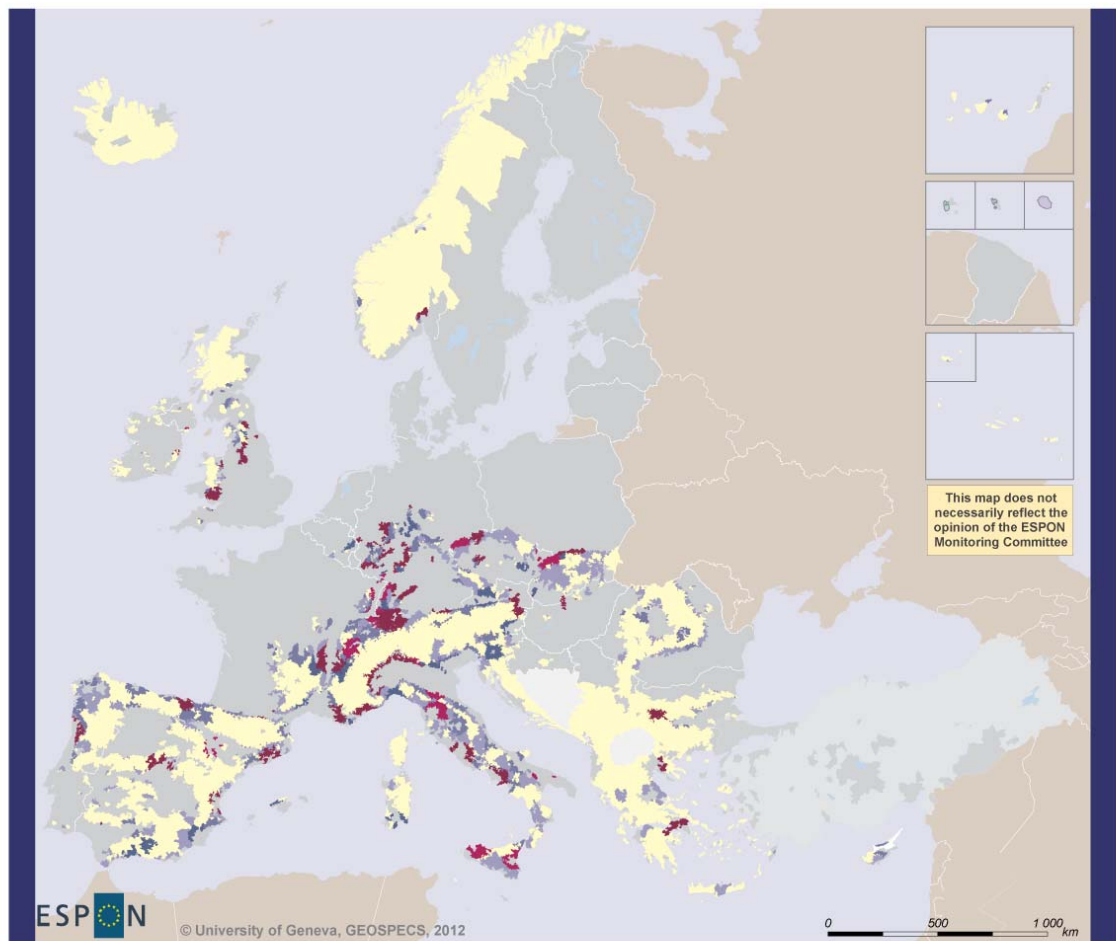
with lower proportions, and those of the south, with high proportions. Similarly, in Italy, proportions are generally low in the northern and high in the southern Apennines. In Greece, coastal and island mountain areas tend to have higher proportions.

With regard to persons over 60, there are relatively few national massifs where the proportions are particularly low compared to the national averages: notably on the islands in the Outermost Regions, as well as Italy's Mediterranean islands. However, there are a considerable number where proportions are comparatively high. Notably, these include the three French massifs with particularly low populations under 15 (Pyrenees, Corsica, Massif Central: respectively 32, 26, 26% compared to the national average of 21%) and Cyprus (25 vs. 16%), suggesting particular challenges for these regions in terms of future population and providing services for ageing populations. For the over-60 population, such patterns are also found at the LAU2 scale (Table 19). Across most of Europe's mountains, the proportion of the population over 60 is markedly greater than for countries as a whole. Only on the islands in the Outermost Regions and in the region comprising the western Alps of Austria and adjacent parts of the Italian Alps, parts of the French Alps, and the mountains along the German/Czech border, and around some major urban centres, are clearly large groups of LAU2s where the proportion over 60 is markedly lower than national averages.

Influences of urban areas

A key issue recognised in the report for the European Commission (2004) was the influence of urban areas close to mountains and in mountains, for flows in two directions: of commuters to the urban centres; and of people from the urban areas for recreation. Map 30 shows the relationships between urban areas and mountains. For relatively narrow mountain massifs, particularly those of the Central European middle mountains, almost entire massifs are within commuting distance of urban areas. This also applies to large proportions of the northern Alps and much of the Apennines, Sicily, and the Slovak Carpathians. Nevertheless, it is notable that 28% of the population of the Alps, and 16% of the Apennines is not within commuting distance of any such centre. However, for many massifs, the accessible proportion does not extend far into the mountains – for example, the Pyrenees, the Romanian Carpathians – while in others, the distribution of accessible urban areas is rather patchy. This is particularly true for the Balkans/southeast Europe, where only 23% of the mountain population is within commuting distance of an urban area. This is a smaller proportion than for any other massif with nearby urban areas (i.e., excluding the mountains of Iceland and Indian Ocean islands); those

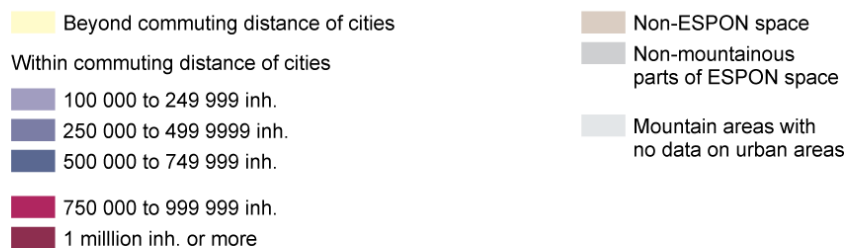
Mountain LAU2 and potential commuting area (PUSH)



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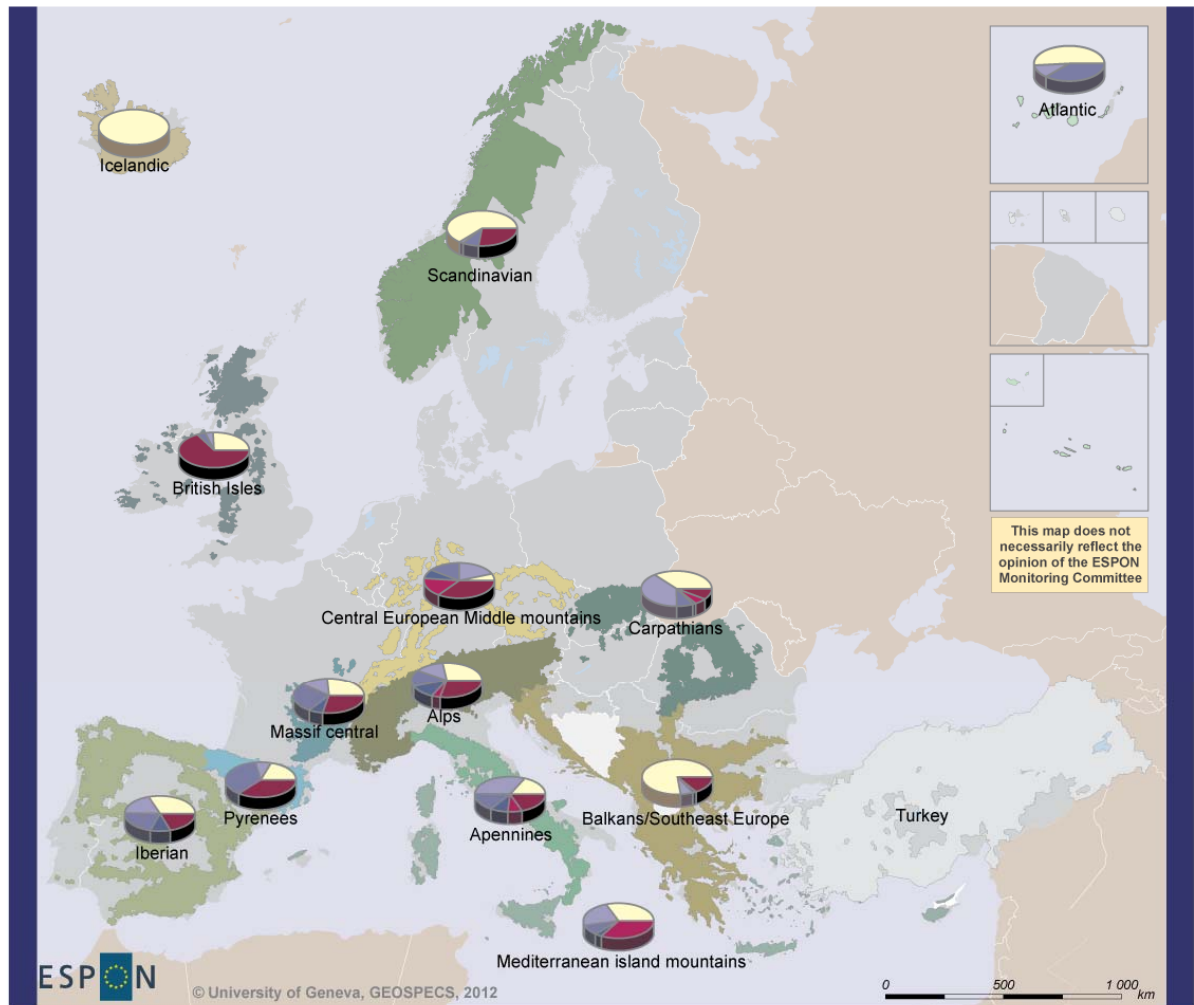
Regional level: LAU2 (except Turkey LAU1)
 Source: GEOSPECS, 2011
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**LAU2 in mountain areas within commuting distance of cities,
 classified according to the number of inhabitants of their Functional Urban Area**



Map 30 Mountain municipalities and PUSH

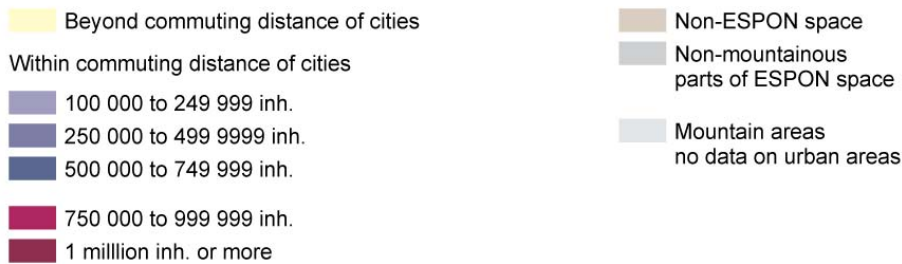
Massifs and potential commuting area (PUSH)



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Regional level: LAU2 (except Turkey LAU1)
Source: GEOSPECS, 2011
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Proportion of massif population within commuting distance of cities, classified according to the number of inhabitants of their Functional Urban Area



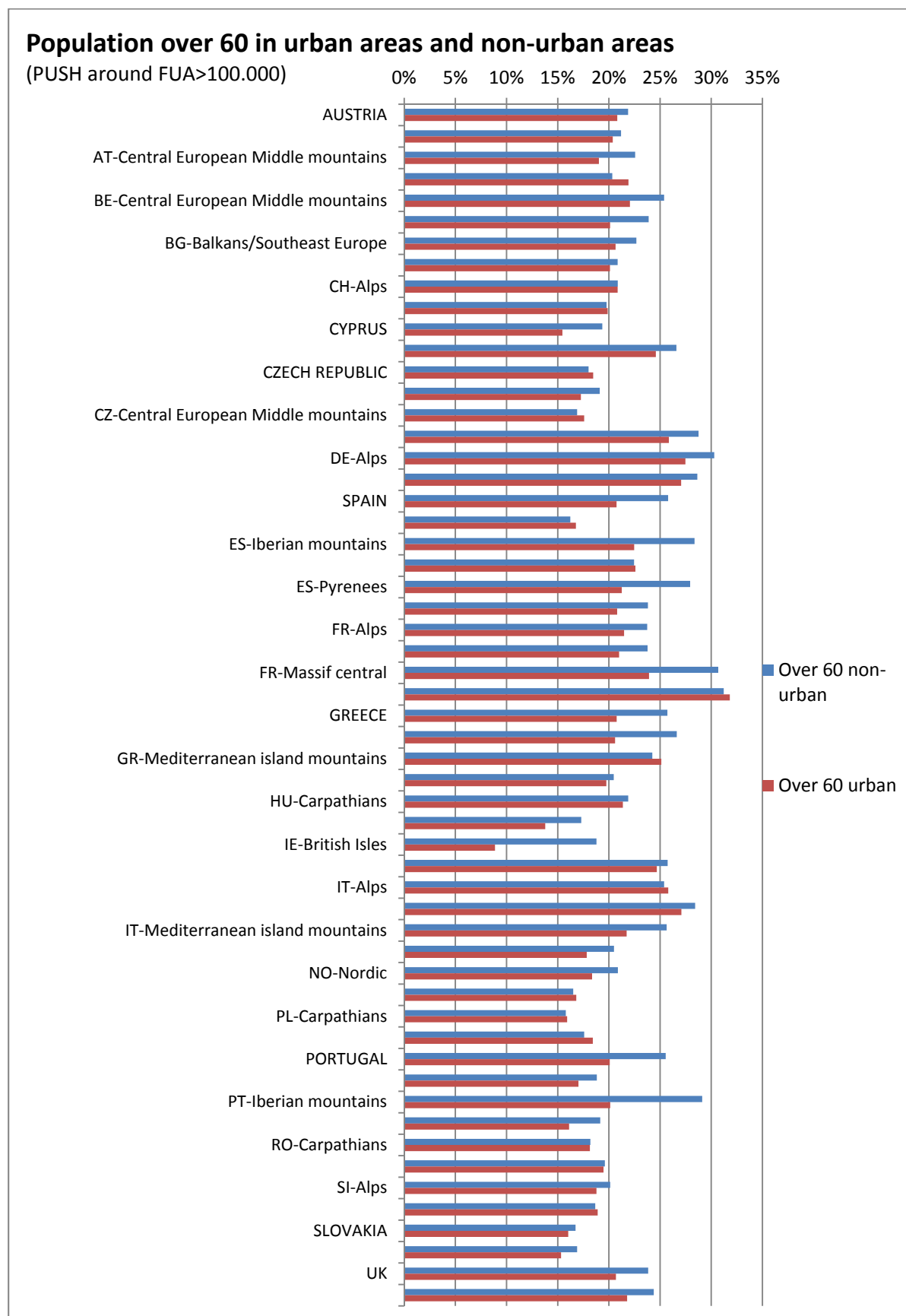
Map 31 Massifs and PUSH

with the next lowest proportions are the Scandinavian mountains (39%), though this is a high proportion in relation to the mountain area; followed by the Atlantic islands mountains (49%), the Carpathians (62%), the Mediterranean islands mountains (67%), and Iberian mountains (68%) (Map 31).

Analysis of the relationships between functional urban areas (FUAs) and age structure shows some clear patterns. This analysis was undertaken for the national parts of massifs, recognising that many relevant forces are at the national scale. The discussion below focuses on the national parts of massifs where the difference in proportions of the respective age classes was more than 2% between urban and non-urban areas. Considering all FUAs with a population over 100,000 vs. areas outside these, in most cases, proportions of children under 15 were similar (i.e., 2% or less). However, for five areas, the differences were greater, with a higher proportion in the FUAs: 5% for Cyprus; 4% for the mountains of Ireland and the Portuguese mainland; and 3% for the Massif Central. At least for these massifs, this suggests a trend for families with children to live nearer or within urban areas. However, these statistics need to be put in their national contexts. In Ireland and the Portuguese mainland, the urban proportion in mountain areas is markedly higher than for the national population, supporting the hypothesis. This is not the case, however, for the Massif Central or Cyprus, where the urban proportion in the mountains is lower (and the non-urban proportion is even lower) than the national average. More detailed analyses, preferably over time would be required to evaluate these hypotheses. For only one national massif was there a marked difference in the other direction: the Jura of Switzerland, where the proportion of mountain children in non-urban areas (21%) was 4% higher than that in urban areas (17%). This finding appears robust in comparison to the national non-urban/urban differential (18 vs. 17%), though a reason is difficult to suggest.

A much more marked, and opposite, pattern is found for the population over 60. In these cases, the proportion in non-urban areas is typically higher, in some cases quite significantly: e.g., for the mountains of Ireland (10%), the mountains of the Portuguese mainland (9%), the Massif Central and Spanish Pyrenees (both 7%), and the Spanish Iberian mountains (6%). In all of these cases, this relationship accentuates national differences (0). Similar relationships are found across all massifs and all countries, with very few minor exceptions (never more than 1% in the other direction), but the difference is comparable to that at the national level and may therefore not be of importance. These findings need to be explored in more detail. However, at least for the five national massifs mentioned above, these data suggest that the rural parts of mountain areas are ageing faster than those living in the urban parts. Combined with the findings presented above, this implies growing challenges for the delivery of services of general interest, especially those that are health-related, in the non-urban parts of mountain areas.

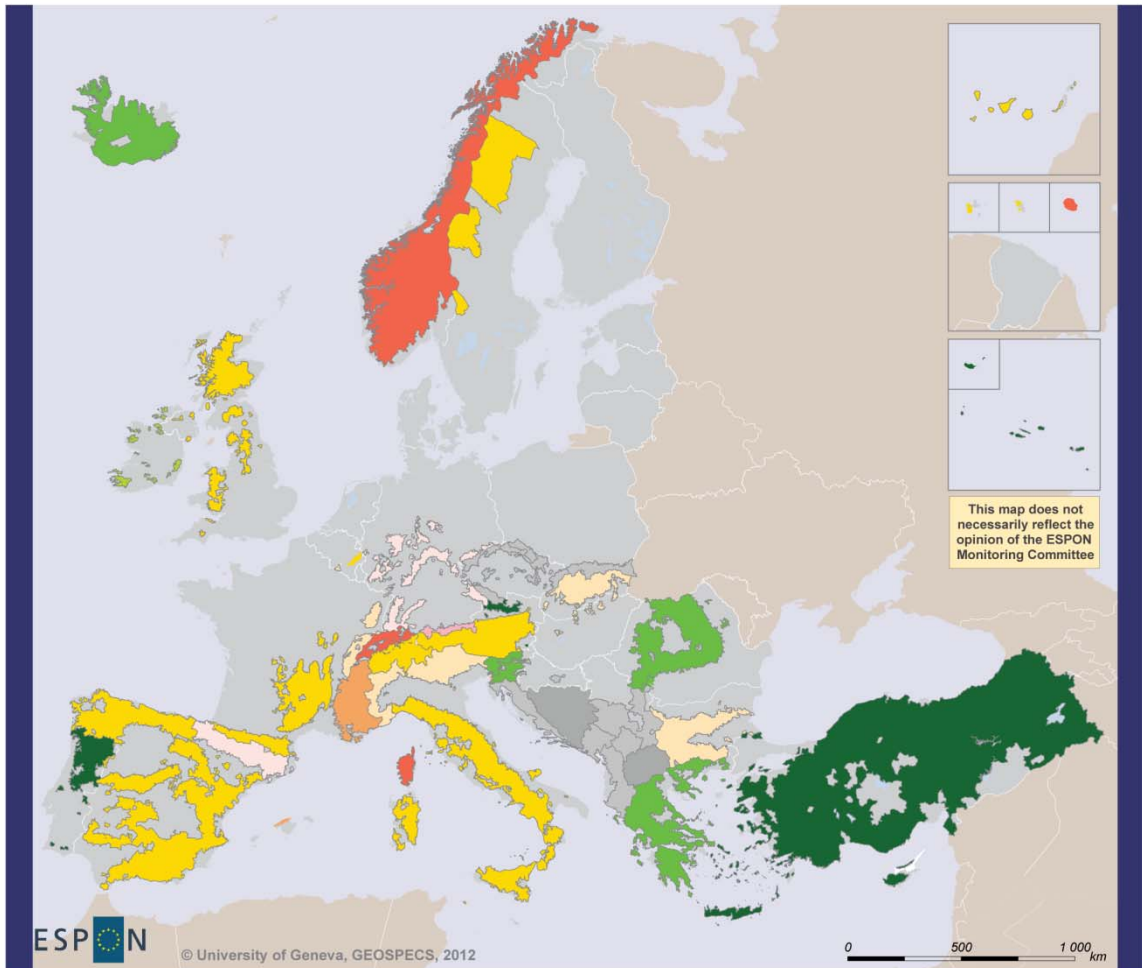
Figure 14 Patterns of employment



Map 32 presents the relative importance of employment in the three sectors for the national parts of massifs. This suggests a complex pattern, with the primary sector dominant in the mountains of the Azores and mainland Portugal, Cyprus, the Greek islands, and Turkey. However, NACE data show that the importance of employment in agriculture (and, in some countries, forestry) varies considerably: 61% of total employment in the mountains of Turkey, 23% in Cyprus, and 21% in Portugal and the Greek islands. Employment in the primary sector is also important in the mainland of Greece (15%), the Romanian Carpathians (13%), Iceland (12%), and Slovenia (10%). The tertiary sector accounts for most employment across Europe's mountains. It is particularly important in the mountains of Norway, where the most important NACE categories are health (18%), trade (14%) and real estate (11%); Corsica (public administration 18%, trade 15%, health 12%); and the Swiss Jura (trade 13%, health 11%), where manufacturing is the most important NACE category (14%). Elsewhere the tertiary sector is not quite as dominant. There are many national parts of massifs where the tertiary and primary sectors are more important than the secondary sector (yellow colours: Spanish Iberian mountains, Apennines, Italian islands, central and eastern Alps, British Isles, Swiss Alps) and others where the secondary sector is comparatively more important (pink colours: Spanish Pyrenees, French and Italian Alps, all Central European middle mountains, Bulgaria).

Given common statements about the importance of tourism in the economy of mountain areas, it is worth noting that there are very few national parts of massifs where employment in the NACE category 'hotels and restaurants' reaches at least 10%, almost all on islands: the Spanish Mediterranean (20%) and Atlantic islands (16%), Greek islands (13%), and Cyprus (10%); as well as the German Alps (14%). However, only for the very first of these is it the first-ranked category. Also of note is that, in the national parts of most massifs other than those mentioned above and the French islands (where public administration is the most important sub-sector), the two most frequent NACE categories are manufacturing and trade, usually in that order.

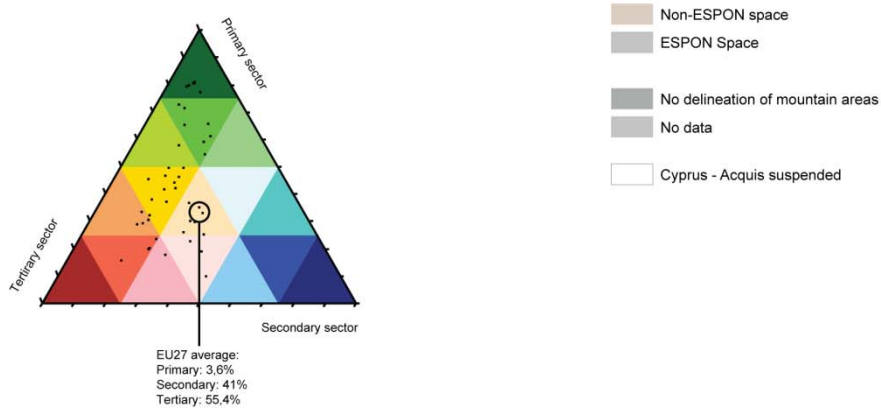
Such highly aggregated data hide very substantial variation, as shown for the Carpathians in Map 33. The dominance of agriculture is clear in most of the Romanian part, though there are also areas where either mining or manufacturing is important. Conversely, in the Slovak and Hungarian Carpathians, the overall dominance of the service sector is clear, including the importance of tourism in and around the Tatra and Fatra mountains.



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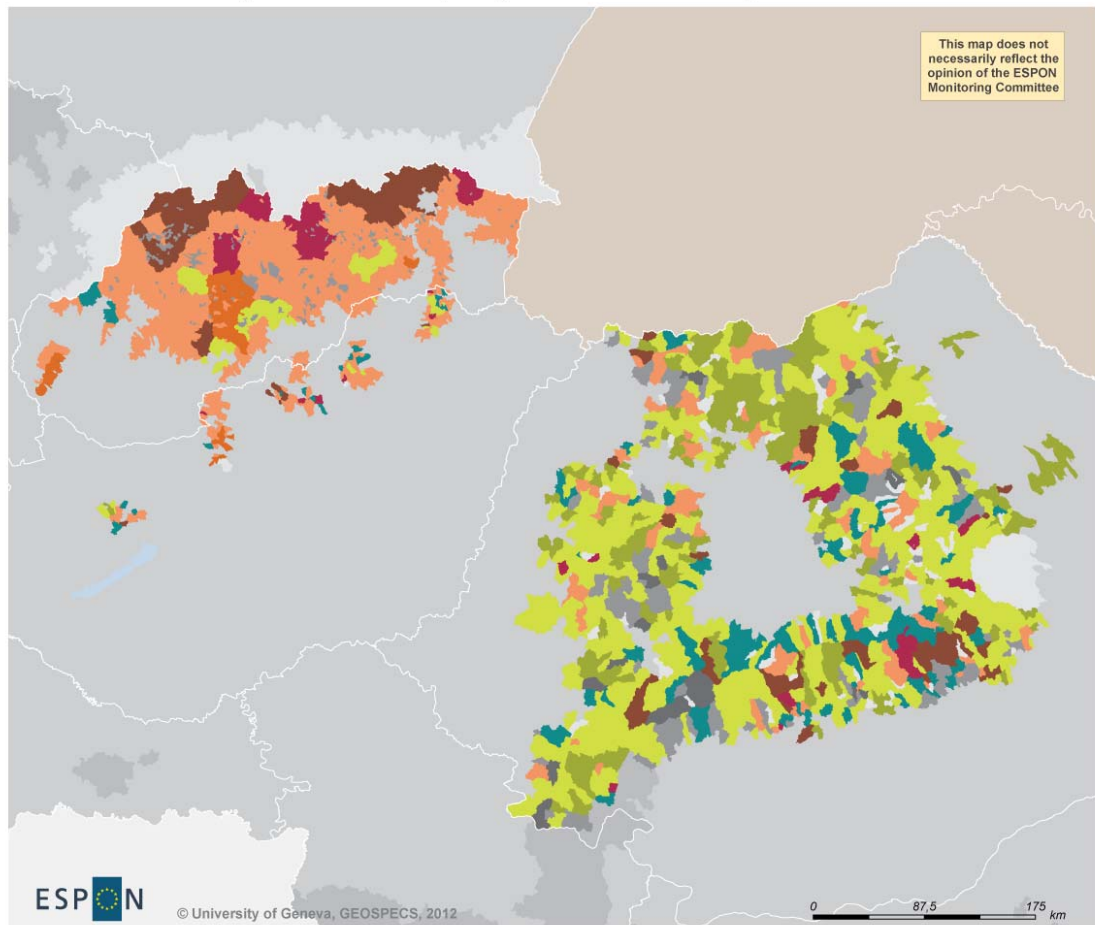
Regional level: Mountain massifs
Source: GEOSPECS, 2011
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Deviations from EU27 average



Map 32 Employment structure by massif

Cluster analysis of employment in Carpathian LAU2



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Regional level: LAU2 (except Slovakia LAU1)
Source: GEOSPECS, 2011
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Ascendant classification of Carpathian LAU2 based on employment by NACE category

Major deviations from average profile - overrepresented sectors

- Agriculture
- Manufacturing and electricity
- Mining strongly overrepresented
- Mining more weakly overrepresented
- Construction
- Private and public services services
- Hotels and restaurants and education

Minor deviations from average profile - overrepresented sectors

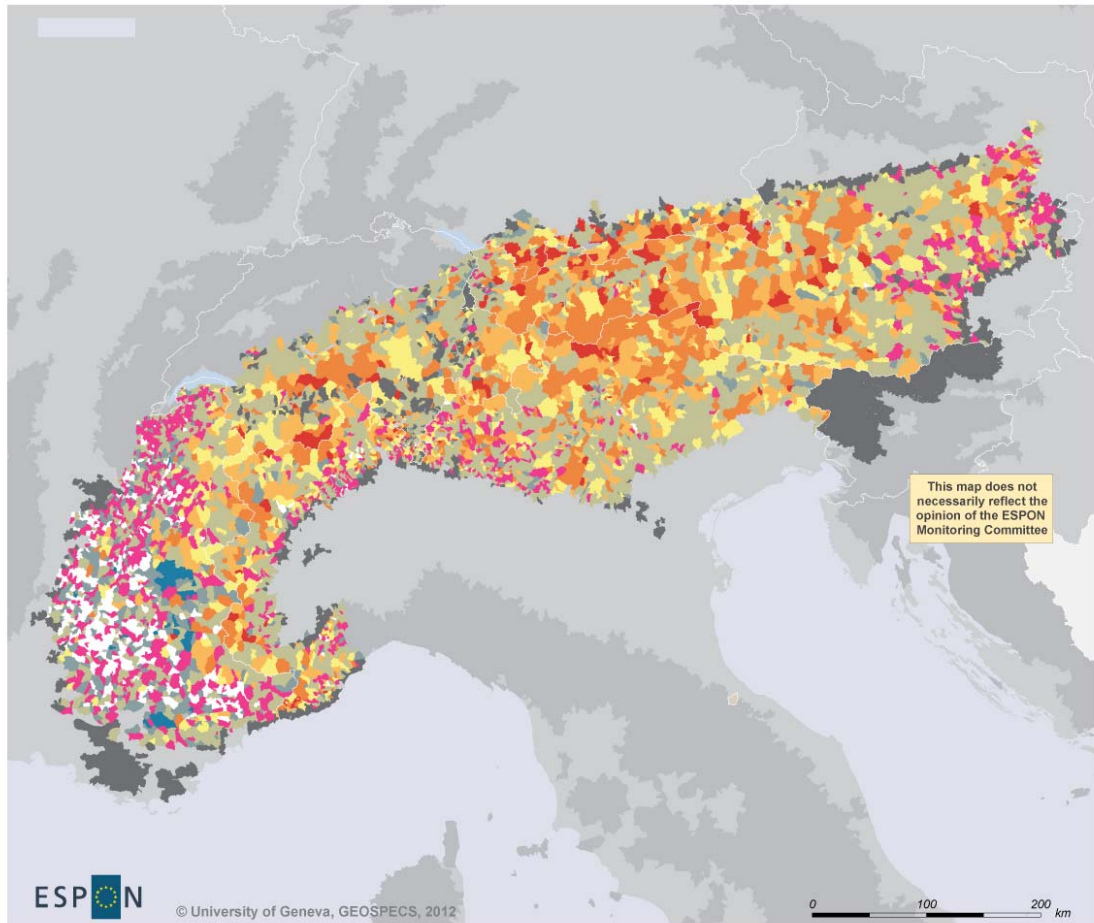
- Close to average profile - agriculture
- Close to average profile - services

Other

- Lakes
- Mountain areas outside the Alps
- Non-mountainous areas
- No data

Map 33 Zoom on municipal employment in the Carpathians

Comparing different indicators of the local importance of tourism



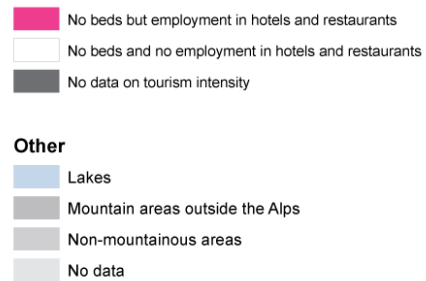
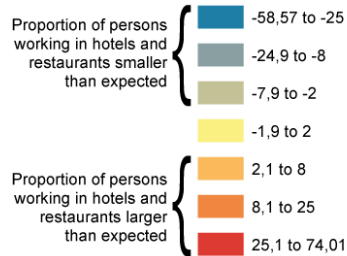
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Regional level: LAU2
Source employment data: GEOSPECS, 2011
Source tourism intensity data: Alpine Convention
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Residuals from linear regression of tourism intensity (number of beds/inh.) and proportion of persons working in hotels and restaurants

Deviations from regression model including LAU2 with beds only



Map 34 Zoom on the importance of tourism in Alpine municipalities

Given the often-stated importance of tourism in the economy of mountain areas, a specific analysis of this sector was undertaken for the Alps, using both NACE data and data on tourism intensity provided by the Permanent Secretariat of the Alpine Convention. The resulting map (Map 34) shows that the importance of tourism in terms of both employment and accommodation varies very significantly at all spatial scales. Nevertheless, the importance of tourism in providing employment in the central Alps of Austria as well as southern Germany, in particular, is clear. Two other patterns are notable: first, the large number of municipalities in the French Alps that are not involved in the tourism sector at all; second, both in the French Alps and on the edges of the Alps in Italy and eastern Austria, there are municipalities with no hotel beds, but where the sector provides employment, both in restaurants and in providing services to those who are not staying in hotels. Many of the latter communities are close to large urban centres, from which residents and visitors presumably come to enjoy mountain food, drink, landscapes and air.

Access to airports

An important issue relating to both the quality of life and the potential for economic development, particularly through tourism, is the availability of airports. Due to the challenges of the terrain – for both flight and landing – airports in mountain areas tend to be limited, so that mountain inhabitants often have to travel outside the mountains to an airport. For the mountain inhabitants of Europe as a whole, 69% do not have access to an airport within 45 minutes, compared to 43% of those living outside mountains. 0 shows these relationships at the national scale. In almost all countries, access to an airport for mountain inhabitants is less than the national average; the exceptions are Bulgaria and Hungary, where part or all of the national capital region is in an LAU2 defined as mountain. Only in two countries does more than half of the mountain population have access to an airport within 45 minutes: Belgium and Switzerland – the former because the mountains are small, and the latter because of particularly good transportation systems. Differences between mountain and non-mountain populations are particularly large in Portugal (13 vs. 44%), Slovakia (8 vs. 20%), Norway (10 vs. 29%), Romania (7 vs. 17%), Germany (34 vs. 62%), and Italy (34 vs. 62%). However, these figures also show the difference in provision of airports between the newer and older states of the EU.

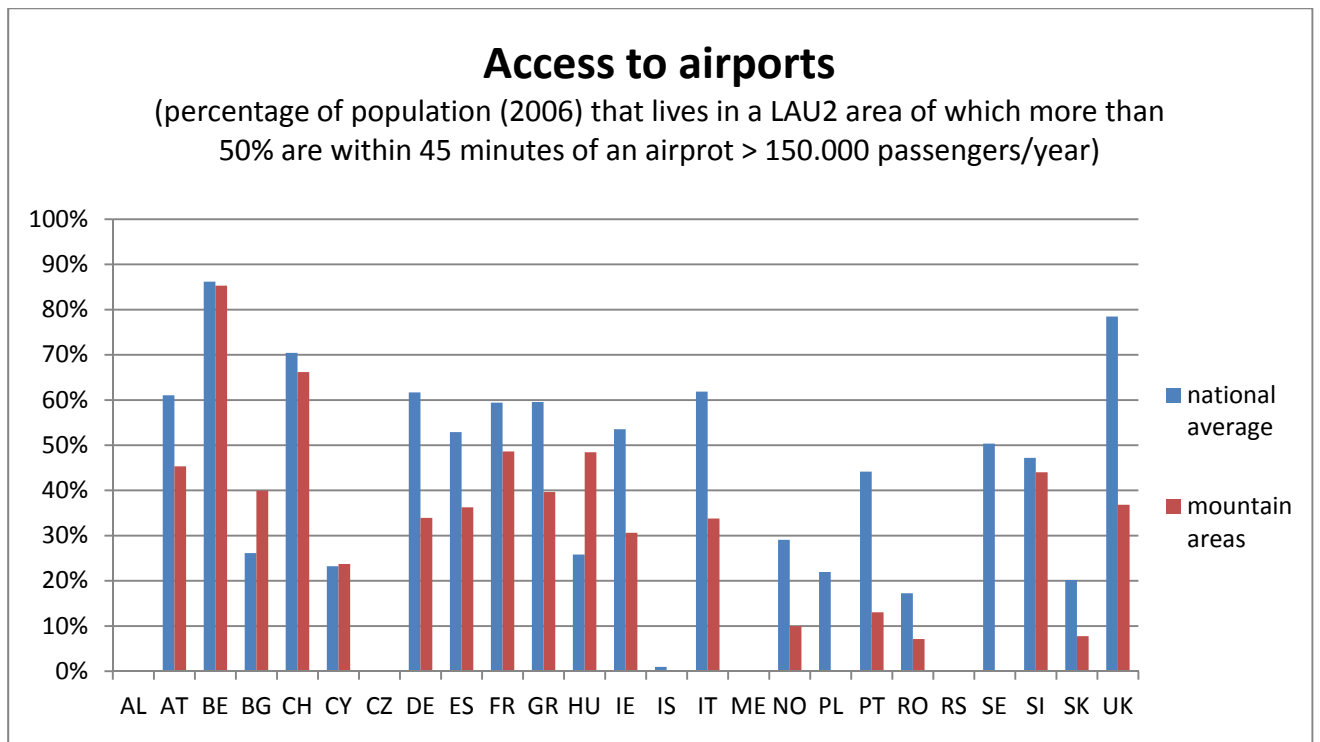


Figure 15 Accessibility to airports

Cross-analyses

Mountains and borders

Across the ESPON space, 10% of the area is occupied by both mountain and border areas (Table 20). One small country, Liechtenstein, is completely covered by both specificities. In absolute terms, the two countries with the greatest overlap are Sweden (84,861 km²) and Norway (59,024 km²), in both cases just below 20% of their area. However, in these sparsely-populated mountains, the population in these areas is rather low. A second group of countries –with large overlaps in terms of total area but, depending on the size of the country as a whole, not necessarily in terms of proportion of national area – are those whose mountainous borders are wholly or partly in the Alps. The population of these overlapping areas varies from 6.4 million in Switzerland (86% of the national population) to 3.3 million in Italy (6%). The scale of overlap is similar for Spain. In terms of area, the overlap is also notable in Slovakia, in both absolute and relative terms. It is notable that in only one country, Bulgaria, is the proportion of the national population within this overlap markedly greater than the proportion of the national area within it. In all other countries, the proportions are similar or the relationship is in the opposite direction. While it might be hypothesized that proportions of populations along the mountainous borders of former socialist countries might be significantly lower than the proportion of the national area, this

does not seem to be the case. Overall, there are no obvious factors that might explain these patterns. In terms of land covers, the mountainous parts of borders have more forest (42% vs. 31% for non-mountain borders), scrub (18% vs. 8%), and no vegetation, mainly in rocky mountains (9% vs. 1%) and less agricultural land (22% vs. 48%) and artificial surfaces (3% vs. 5%).

Table 20 Mountain/border overlaps (only countries with at least 20,000 km²)

Country	Mountain/border overlap (km ²)	Mountain/border overlap (% of national area)	Mountain/border overlap (population)	Mountain/border overlap (% of national population)
Sweden	84,861	19	70,184	1
Norway	59,024	18	746,078	16
France	49,124	8	3,497,492	6
Austria	44,112	53	3,668,316	44
Spain	43,341	9	2,772,714	6
Switzerland	33,772	82	6,374,636	86
Germany	33,093	9	4,917,041	6
Italy	32,748	9	3,298,546	6
Slovakia	28,742	59	2,581,194	48
Greece	25,883	20	1,119,057	10
Czech Republic	24,975	32	2,352,405	23
Portugal	20,621	22	1,107,802	11
Romania	20,429	9	1,246,195	6
ESPON space	573,689	10	39,572,557	8

Mountains and islands

Across the ESPON space, 2% of the area is occupied by mountains on islands. There are only four countries for which this overlap of specificities covers more than 10% of the national area: Iceland (85%: 86,811 km²); Cyprus (46%: 4286 km²); Greece (13%: 11,436 km²) and Italy (12%: 36,003 km²). For two of these, the proportion of the national population living on the mountainous parts of these island states is significantly less than their proportion of the national area: Iceland (22% population [66,617], 85% of area) and Cyprus (15% [115,007]; 46%), showing that most settlement is on flatter areas. For the other two, both with much larger mountain/island populations, the difference is less: Greece (7%

[1.2 million]; 13%): 1.2 million; Italy (7% [4.0 million]; 12%). It is also worth noting the opposite relationship in Spain, the country with the second largest mountain/island population (1.9 million) who comprise 4% of the national population but live on 1% of the national territory. In France, with the third largest mountain/island population (1.2 million), the proportion is 2% for both population and area (11,435 km²). In terms of land covers, the mountainous parts of islands have more scrub (37%, vs. 27% for non-mountain parts of islands), unvegetated land (23% vs. 10%) and glaciers/snowfields (6% vs. 0%). Conversely, they have less agricultural land (19% vs. 37%), forest (9% vs. 12%), wetland (3% vs. 7%) and artificial surfaces (1% vs. 4%).

Mountains and coasts

Across the ESPON space, 14% of the area is occupied by both mountain and coast. There are 14 countries for which more than 10% of the national area is covered jointly by mountains and coast (Table 21). Of those with high proportions, some of these are mountainous island countries (Iceland, Cyprus) or countries with many mountainous islands (Greece, Norway, Italy, Croatia, UK). Also notable in absolute terms are the overlaps for Spain and Turkey. In terms of population, it is notable that over half of the 40 million people in this overlap in the ESPION space (excluding Turkey, for which data are not available) are in two countries: Italy and Spain. In general, the proportion of the population living in the overlap is greater than the respective proportion of the national area, sometimes very markedly (e.g., Iceland, Cyprus, UK, Ireland). This clearly relates to the challenge of providing infrastructure in the challenging terrain where these two specificities overlap. Nevertheless, there are some countries where the difference between these proportions is small, for instance Norway, where there has been considerable investment in the development of infrastructure along coasts, including the construction of many tunnels through mountains. This is also true in Spain, where the usual relationship is reversed, with the overlap including 19% of the national land area, but 24% of the national population. Similar relationships, though of lesser magnitude, are found in Albania and Portugal. In terms of land covers, mountainous coasts have more scrub (27% vs. 9% for no-mountainous coasts) and more unvegetated land (16% vs. 1%); the latter may often reflect past human exploitation, such as the denuded mountains found along much of the Mediterranean coast. Conversely, mountainous coasts have less agricultural land (23% vs. 51%) due to the challenges on cultivation on steep terrain, and fewer artificial surfaces (2% vs. 6%) due to challenges of construction.

Table 21 Mountain/coast overlaps (only countries where at least 10% of national area overlaps)

Country	Mountain/coast overlap (km ²)	Mountain/coast overlap (% of national area)	Mountain/coast overlap (population)	Mountain/coast overlap (% of national population)
Iceland	85,294	83	66,241	22
Greece	84,622	64	4,231,740	38
Norway	184,677	57	2,315,344	50
Cyprus	4,286	46	115,007	15
Italy	115,515	38	13,248,086	23
Croatia	19,132	34	N/A	N/A
Slovenia	6,360	31	421,153	21
UK	63,648	26	3,530,791	6
Montenegro	2,753	20	136,594	20
Spain	98,454	19	10,949,786	24
Albania	4,770	17	711,536	22
Turkey	113,032	15	N/A	N/A
Portugal	11,525	13	1,555,211	15
Ireland	7,876	11	136,322	3
ESPON space	834,427	14	40,021,216	8

Mountains and SPA

Across the ESPON space, 14% of the area is occupied by mountains which are also SPA. Half of this is within three Nordic countries, the most in Norway (224,191 km², 69% of national area), followed by Sweden (87,826 km², 20%) and Iceland (82,528 km², 80%). However, the country with the greatest overlap between these specificities is Turkey (296,634 km², 38%). The only other countries where the overlap between these specificities is notable are Spain (59,150 km², 12%), the UK (16,153 km², 7%) and Bulgaria (11,238 km², 10%). Given the definition of SPAs, the population of these areas is not very large (though it should be noted that population data for Turkey are not available): the only countries with populations over 100,000 in these areas are Norway (941,630, 20% of the national population), Spain (512,958, 1%) and Bulgaria (199,369, 3%). In terms of land covers, the mountainous parts of SPAs have significantly less forest (22%, vs. 52% for non-mountain parts of SPAs), but more agricultural land (16% vs. 12%), scrub (27% vs. 18%), and unvegetated land (25% vs. 3%).

Protected areas

The recent EEA report (EEA, 2010) includes a chapter on protected areas, including analyses, at both massif and national level, of the coverage of sites designated under both national and EU legislation. One issue that this report addressed was the relative proportion of nationally-designated areas within and outside mountain areas. As Figure 16 shows, the proportion inside mountains is generally greater in all countries, though to varying extents, and not in Austria or Spain. Considering the common statement that the designation of protected areas under national legislation may reflect the ease of designation rather than, necessarily, the need to maintain biodiversity (a topic also considered in detail in EEA, 2010), the occurrence of nationally-designated protected areas in mountain border areas was analysed. The definition of these areas is described above. The results of the analysis show that the proportion of nationally-designated areas in mountain border areas is only greater than for the national mountain area for four countries: Romania, Greece, Norway and the UK (though the latter is along a rather short border with Ireland). For other countries, the proportions are similar, or the reverse situation is found. It would therefore appear that, at least at the national scale of analysis, proximity to a border is not a factor increasing the likelihood of designation.

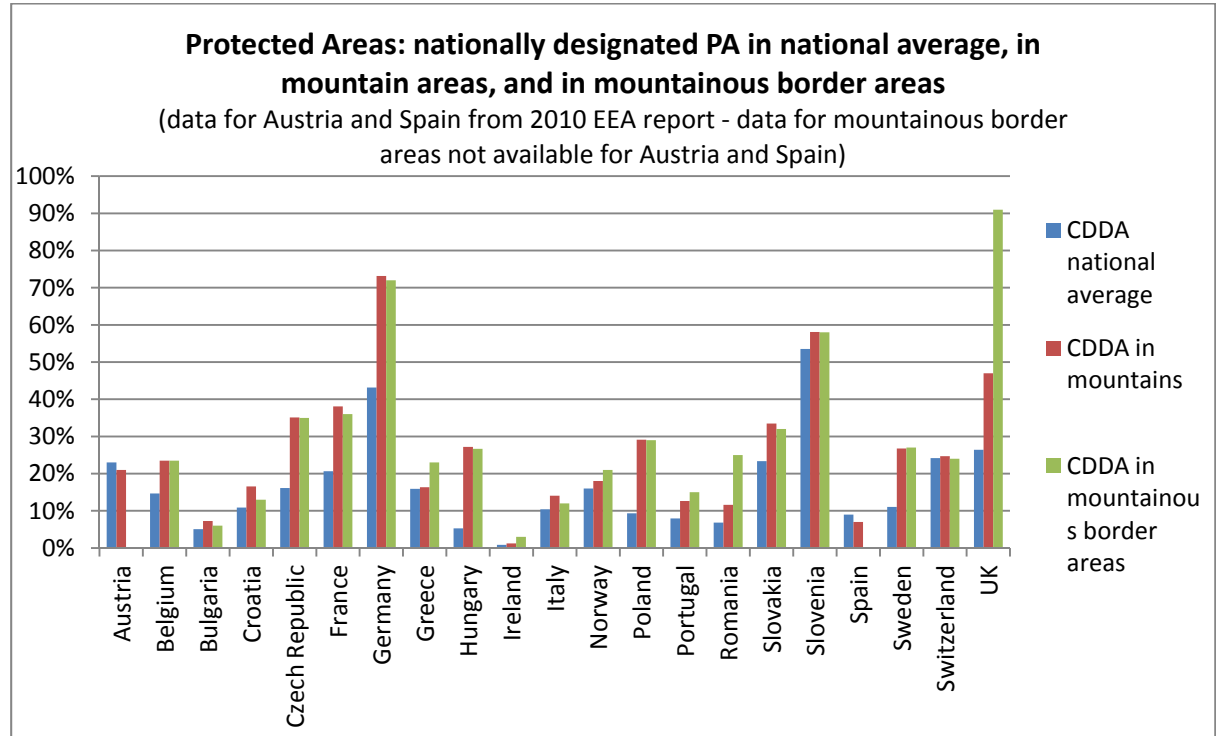


Figure 16 Protected areas in mountainous border areas

4.1.2 Islands

Approximately 5.6% of the total ESPON territory is composed of islands, amounting to 274,931km². These islands host 20.5m inhabitants, equivalent to 4.1% of the total for the territory.

Island territories are all characterised by their predominance of coastal areas, peripherality and detachment from centres of human activity. It is however important to recognise differences to the extent to which these conditions may prevail upon specific island territories. This note argues this case through an analysis of geographical, accessibility, demographic, economic and land use data for a total of 292 islands in the ESPON territory (0), covering a land area of 271,038 km² with a population of approximately 20.1m inhabitants¹⁰⁰. The database, which has been specifically compiled for the GEOSPECS project, is constructed upon data units at the LAU2 level¹⁰¹, which provides for a more detailed assessment and correlation of other geographic specificities, population, economic and land use conditions within different island territories.

By far the largest number of islands is considerably small both in terms of land area (less than 1000km²) as well as population size (less than 100,000 inhabitants). Having said this, however, there is a greater number of total municipalities in islands that exceed 1000km² in size and in those whose population range between 100,000 and 1m people. By assessing the average annual sunshine hours one can conclude that the majority of the small islands, in terms of land area and population size, are located in the north whereas the larger islands are predominantly found in the southern ESPON regions. The Mediterranean Sea is home to the largest number of islands, municipalities as well as inhabitants, and in it are located the only three islands with a population larger than 1m, namely Sicily, Sardinia and Cyprus. The largest island surface area occupied by islands is however in the Atlantic Sea, reflecting Iceland that occupies 85% of this land area.

Approximately 67.5% of the total island area is mountainous. This feature is, however, true for less than 40% of total islands, most notably in the Mediterranean and Atlantic Seas. In addition, approximately 20% of the municipalities assessed are archipelagos, reflecting very small territories¹⁰²

¹⁰⁰ Data limitations led to the consideration of an estimated 98% of island territories within the ESPON area in terms of both land area as well as population.

¹⁰¹ A total of 3073 municipalities were assessed

¹⁰² This is true for 35% of total islands analysed

whose municipality spreads over more than one island. Almost all the islands of the Outermost regions form part of this category although, in terms of surface area, the Mediterranean and Atlantic Seas are more representative of this characteristic.

Table 22 Geographical analysis

	Land Area (sq km)	LAU2 territories	Islands	2006 Population	Average annual hours of sunshine	Population density (persons per sq km)
Total	271,038	3,073	292	20,087,600	6,857	68.7
Island area < 1000 sq km	40,996	876	264	3,630,267	5,493	85.9
Island area > 1000 sq km	230,042	2,197	28	16,457,333	7,401	65.6
Not sparsely populated	158,281	2,852	269	19,724,795	6,904	115.4
Sparsely Populated	112,758	221	23	362,805	6,254	3.1
No fixed link	233,316	2,783	225	15,451,288	7,070	63.1
Fixed link	37,722	290	67	4,636,312	4,812	103.2
Atlantic	120,684	541	58	3,118,967	4,690	23.4
Baltic	27,742	185	44	4,077,220	4,874	119.7
Mediterranean	98,617	2,136	102	10,908,553	7,728	106.4
North Sea	6,079	77	48	298,759	4,027	50.5
Norwegian and Barents Seas	12,671	44	32	190,507	3,570	15.9
Outermost Region	5,245	90	8	1,493,594	7,317	281.0
Not mountainous	87,849	1,258	179	11,360,672	6,604	116.7
Mountainous	183,190	1,815	113	8,726,928	7,033	45.7
Archipelago	39,374	626	105	5,787,599	6,077	134.7
Not Archipelago	231,665	2,447	187	14,300,001	7,057	57.5
PUSH < 100,000	222,502	2,019	280	7,751,751	6,421	33.2
PUSH > 100,000	48,536	1,054	12	12,335,849	7,693	231.5
Island population < 100,000	58,814	676	267	2,447,045	5,245	40.7
Between 100,000 and 1m	155,376	1,597	22	8,456,455	7,445	47.8
Island population > 1m	56,848	800	3	9,184,100	7,047	154.8

In terms of sparsity, almost half of the total land area on islands is considered to be sparsely populated, a feature most commonly present in mountainous areas, although this is concentrated in a very few number of islands and municipalities. In terms of land area, this trait is most prominent in the Atlantic Sea, predominantly Iceland, whereas the majority of sparsely populated islands are located in the Norwegian Sea. Although most municipalities assessed are not sparsely populated, only approximately one third of these provide their inhabitants with the possibility of reaching an urban area with a population potential exceeding 100,000 people within a 45 minute time span (PUSH>100,000)¹⁰³. This characteristic is mostly true of the larger islands, since it is only possible

¹⁰³ PUSH around a MUA of which FUA > 100'000 = Potential urban strategic horizon around a Morphological Urban Area of which the Functional Urban Area exceeds 100,000 people

to achieve this population potential on 12 islands, most of which in the southern, sunnier regions.

This note delves into various aspects of “islandness” in the ESPON territory broadly categorised under four themes, namely (i) accessibility, (ii) demography, (iii) economic structure, and (iv) land use.

Accessibility

Accessibility is hereby assessed by the extent to which island populations are served in terms of air transportation or fixed links to a mainland. Air transportation is assessed in terms of (i) the proportion of people that are able to access, within 45 minutes, an airport serving at least 150,000 passengers p.a. and (ii) the population potential per islander that is accessible as a result. The latter is broadly affected by three factors, namely the number of airline connections available (as reproduced in Table 23), their frequency, and the destination of these flights. Given the very high correlation between the total population potential and number of airline connections¹⁰⁴, the latter will not be extensively debated in this assessment. The accessibility brought about by the use of a fixed link will be mainly assessed by the proportion of the island populations corresponding to specific characteristics which are served by a fixed link.

Approximately 22.6% of island populations within the ESPON region can access, within 45 minutes, an airport serving at least 150,000 passengers p.a. A similar proportion, 23.1% is able to make use of a fixed link to a mainland. In general terms, islands not served by a fixed link are generally those with better air accessibility. This indicates that islands are confronted with difficult decisions in choosing the main mode of accessibility, which is critical to optimise cost-effectiveness and development in the long run. This analysis further indicates that at least 54% of island populations are not served by either a fixed link or adequate air connections.

Fixed links are prevalent in small islands by population size where air accessibility is largely inadequate. In terms of location, the incidence of fixed links is most common in northern islands, most notably the Baltic islands as well as those islands located in the North, Norwegian and Barents Seas, with approximately 93% of their total population served by this infrastructure. Air accessibility is by contrast relatively poor in these islands, especially in the North, Norwegian and Barents Seas. In the Baltic Sea, a relatively better access to airports is nevertheless generating a poor outcome in terms of population potential reached by air

¹⁰⁴ Correlation coefficient = 0.98

transportation, which may have strengthened the need for the construction of these fixed links on islands in this sea. The same argument applies to non-mountainous municipalities which, although appearing to be adequately served by air transportation, are only able to access a low population potential by this means of transportation thereby corroborating the need for the construction of fixed links to mainland.

Table 23 Accessibility analysis

	% population accessing an airport of more than 150,000 px/yr in 45 mins	Number of airline connections of more than 150,000 px/yr	Population potentials of non-stop flights from airports	Population potential of non-stop flights from airports per person	% of population served by a fixed link
Total	22.6%	11.4	143,962,398	7.2	23.1%
Island area < 1000 sq km	15.9%	8.2	29,050,762	8.0	21.1%
Island area > 1000 sq km	25.3%	12.7	114,911,636	7.0	23.5%
Not sparsely populated	22.9%	12.0	140,062,048	7.1	22.6%
Sparsely Populated	18.9%	3.6	3,900,350	10.8	47.8%
No fixed link	23.8%	11.6	135,960,121	8.8	0.0%
Fixed link	11.7%	9.4	8,002,277	1.7	100.0%
Atlantic	10.4%	13.8	25,492,491	8.2	5.1%
Baltic	18.6%	14.3	7,830,265	1.9	95.2%
Mediterranean	28.0%	11.6	110,450,423	10.1	2.3%
North Sea	7.4%	1.2	181,840	0.6	65.2%
Norwegian and Barents Seas	3.9%	0.5	7,379	0.0	80.8%
Outermost Region	0.0%	-	-	-	0.0%
Not mountainous	24.1%	12.2	61,616,201	5.4	38.3%
Mountainous	21.6%	10.9	82,346,197	9.4	3.2%
Archipelago	20.4%	20.0	45,238,624	7.8	0.4%
Not Archipelago	23.2%	9.2	98,723,774	6.9	32.3%
PUSH < 100,000	17.6%	7.1	58,623,180	7.6	15.2%
PUSH > 100,000	32.2%	19.6	85,339,218	6.9	28.1%
Island population < 100,000	9.8%	3.1	7,534,873	3.1	35.7%
Between 100,000 and 1m	27.8%	14.6	95,732,119	11.3	14.2%
Island population > 1m	23.2%	12.2	40,695,406	4.4	27.9%

Mediterranean islands, as mentioned earlier, appear to be adequately served by air transportation, possibly reflecting its importance to the tourism industry. Consequently, the number of fixed links is restricted to merely three - built on islands which appear to have particularly poor, if any at all, means of air transportation. The latter is also true for island archipelagos with only one archipelago having a fixed link largely due to an inadequate air transportation service. Air accessibility is relatively worse for those islands whose municipalities are predominantly sparsely populated. In order to counteract this, 21 out of 23 of these islands are served by a fixed link. The same phenomenon is seen in the mountainous islands with those even more disadvantaged in terms of air accessibility having built a fixed link. Air accessibility is relatively better for those municipalities whose inhabitants have the possibility of reaching an urban

area with a population potential exceeding 100,000 people within a 45 minute time span (PUSH>100,000). As a result, in order to counteract this deficiency, 90% of all fixed links are on islands with a PUSH that is less than 100,000 people notwithstanding the fact that a lower percentage of total population can benefit from this infrastructure.

Demography

Most islanders in the ESPON area reside on islands in the Mediterranean Sea (Table 24). Notwithstanding this, the Baltic islands have a higher population density possibly reflecting the attractiveness of residing on islands served by a fixed link, given the predominance of this feature in this area. This conclusion can also be derived when assessing the population growth between 2001 and 2006 which was particularly high for municipalities on islands in the Baltic Sea as well as municipalities served by a fixed link. This is further corroborated by the fact that those islands in the Baltic Sea that do not have a fixed link faced a decline in population over the same period. Having said this, however, the decline in population on islands in the North Sea as well as the Norwegian and Barents Seas could reflect the fact that, although fixed links have been built on these islands, other important characteristics that are deemed essential for residential attractiveness are missing. Therefore, although fixed links can help to better an island's economic and residential prospects, they cannot be viewed as an end, or a complete solution, in themselves.

Population density is also particularly high for those municipalities with a total island population that exceeds 1 million. However these areas, represented by merely three Mediterranean islands namely Sicily, Sardinia and Cyprus, have experienced relatively low population growth between 2001 and 2006 broadly in line with all other islands in the Mediterranean Sea. Population growth has mainly taken place in islands of a medium population size (between 100,000 and 1,000,000), which may be indicative of a greater attraction to areas with a relatively lower population density. The same logic can be applied to municipalities on islands with a total land area exceeding 1000km² that appear to have grown by a greater degree than municipalities on smaller, relatively more densely populated islands. However there appears to be a certain threshold that backs this interpretation where sparsely populated areas do not seem to be faring as well as non-sparsely populated areas in terms of residential attractiveness.

Non-mountainous municipalities as well as municipalities close to an urban hub with a relatively large population potential are two other categories that seem to be more attractive for residential purposes as verified by

data reflecting total population, population density, as well as population growth between 2001 and 2006. This may be due to better anthropic capital present in these areas including certain services, as previously discussed, which may facilitate the living conditions for residents.

In terms of demographic structure, population ageing is most predominant in the Mediterranean region, including its islands, which has the largest proportion of people aged 60 or over and the lowest percentage of children under the age of 15. Apart from having a relatively low childbirth rate¹⁰⁵, the ageing of the Mediterranean population may also be due to people being more attracted to residing in warmer climates in their older age.

Table 24 Demographic analysis

	2006 Population	Population density (persons per sq km)	Population growth 2001-2006	% population aged 60 or older	% population aged 15 or younger	% population aged between 16 and 59
Total	20,087,600	68.7	1.53%	19.58%	17.23%	63.19%
Island area < 1000 sq km	3,630,267	85.9	0.61%	18.47%	16.19%	65.34%
Island area > 1000 sq km	16,457,333	65.6	1.74%	19.84%	17.47%	62.69%
Not sparsely populated	19,724,795	115.4	1.55%	19.56%	17.20%	63.24%
Sparsely Populated	362,805	3.1	0.59%	20.59%	18.49%	60.92%
No fixed link	15,451,288	63.1	0.97%	19.28%	17.06%	63.66%
Fixed link	4,636,312	103.2	3.56%	20.74%	17.86%	61.40%
Atlantic	3,118,967	23.4	2.00%	17.17%	17.50%	65.33%
Baltic	4,077,220	119.7	4.19%	20.40%	17.78%	61.83%
Mediterranean	10,908,553	106.4	0.78%	20.77%	15.89%	63.34%
North Sea	298,759	50.5	-0.56%	19.89%	20.36%	59.75%
Norwegian and Barents Seas	190,507	15.9	-1.10%	20.67%	20.28%	59.05%
Outermost Region	1,493,594	281.0	0.27%	13.43%	24.35%	62.22%
Not mountainous	11,360,672	116.7	2.07%	18.82%	16.94%	64.24%
Mountainous	8,726,928	45.7	0.85%	20.53%	17.58%	61.89%
Archipelago	5,787,599	134.7	1.76%	17.06%	18.57%	64.37%
Not Archipelago	14,300,001	57.5	1.44%	20.57%	16.70%	62.73%
PUSH < 100,000	7,751,751	33.2	0.98%	19.88%	18.14%	61.98%
PUSH > 100,000	12,335,849	231.5	1.89%	19.38%	16.63%	63.99%
Island population < 100,000	2,447,045	40.7	0.43%	22.18%	17.06%	60.76%
Between 100,000 and 1m	8,456,455	47.8	2.64%	16.65%	17.84%	65.51%
Island population > 1m	9,184,100	154.8	0.86%	21.36%	16.75%	61.88%

Islands in the Baltic, North, Norwegian and Barents Seas are also characterised by a relatively high proportion of older people. They also appear, however, to have a relatively higher proportion of youths and children than other regions in the ESPON area which may reflect their excellence in offering education and health services given the large share

¹⁰⁵ http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Fertility_statistics

of people employed in these sectors¹⁰⁶. In addition, the greater importance attributed to family-friendly measures in northern regions, including the extensive use of childcare centres, could be incentivising people to have more children.

On the other hand, the low percentage of older people in the Outermost Regions could reflect their relatively low life expectancy.

The greatest proportion of people aged between 16 and 59 are predominantly found on islands with a medium population size (between 100,000 and 1,000,000) and small land area (<1000km²). This age group may be attracted by better work prospects given the relatively higher rate of employment on islands with these characteristics. Islands in the Atlantic Sea also seem to offer better work opportunities than islands in other geographical regions which again may be attracting people of working age to these territories.

Economic Profile

Smaller islands have a slightly larger proportion of people in employment, as smaller communities may tend to result in a greater need for persons to actively participate in the labour market (Table 25**Error! Reference source not found.**). This is most likely to be in the primary sector, which is stronger for smaller islands. Smaller islands are also more dependent on the retail and tourism sector as they rely on their attractiveness and small size to appeal to visitors. Small islands have fewer people working in education and health, which might imply that they rely on the mainland or other larger islands for the provision of these services. Smaller islands are also more diversified than larger ones, which implies that residents on these islands need to keep their employment options open and find it hard to specialise in a few areas. This factor also emerged from the Outer Hebrides case study, where people had to work a number of different jobs in order to reduce the impact of seasonality on their income.

Sparsely populated islands have a higher employment rate, which is mainly being driven by a higher employment rate in the primary sector. They have a comparatively lower retail and tourism industry and a substantially lower share of public employment, which is even lower than that for small islands. This would indicate that these islands fall under the public administration of larger units, however this is partially compensated by the higher share of people employed in health and education. This highlights the fact that the national scale and standards of education and health are often rolled out to all citizens regardless of the economic mass

¹⁰⁶ Table 25: Economic Analysis

Table 25 Economic analysis

	Employment Rate out of Total Population	Share of Primary Sector	Share of Secondary Sector	Share of Retail and Accommodation	Share of Public Employment	Share of Education and Health	Index of diversification (1=highest diversification)
Total	30.8%	7.2%	26.2%	31.0%	11.6%	24.0%	0.79
Island area < 1000 sq km	33.1%	10.6%	26.0%	32.4%	10.4%	20.6%	0.80
Island area > 1000 sq km	30.2%	6.3%	26.2%	30.7%	12.0%	24.9%	0.78
Not sparsely populated	30.6%	7.0%	26.2%	31.2%	11.7%	23.9%	0.78
Sparsely Populated	39.4%	13.4%	26.1%	21.9%	9.4%	29.2%	0.85
No fixed link	29.6%	8.3%	25.9%	32.6%	12.4%	20.9%	0.80
Fixed link	35.3%	3.7%	27.0%	26.1%	9.3%	33.9%	0.69
Atlantic	40.2%	8.2%	26.6%	37.2%	9.6%	18.4%	0.72
Baltic	35.9%	2.9%	26.4%	26.2%	9.4%	35.2%	0.67
Mediterranean	27.2%	8.9%	26.5%	32.1%	12.3%	20.2%	0.80
North Sea	34.8%	5.5%	28.4%	29.2%	7.8%	29.1%	0.71
Norwegian and Barents Seas	36.3%	8.9%	27.1%	18.8%	7.2%	38.0%	0.69
Outermost Region	25.0%	4.9%	20.9%	21.9%	21.9%	30.4%	0.82
Not mountainous	33.0%	5.6%	27.1%	30.6%	10.6%	26.1%	0.75
Mountainous	28.0%	9.5%	24.7%	31.7%	13.1%	21.0%	0.83
Archipelago	35.5%	7.6%	25.7%	37.3%	11.7%	17.7%	0.73
Not Archipelago	28.9%	7.0%	26.4%	27.9%	11.6%	27.1%	0.79
PUSH < 100,000	32.5%	10.4%	25.5%	31.2%	11.6%	21.3%	0.83
PUSH > 100,000	29.7%	4.9%	26.6%	30.9%	11.7%	25.9%	0.75
Island population < 100,000	33.6%	11.3%	26.0%	31.3%	9.5%	21.9%	0.81
Between 100,000 and 1m	35.4%	7.2%	27.1%	34.5%	11.1%	20.1%	0.75
Island population > 1m	26.1%	5.8%	25.2%	26.9%	13.0%	29.2%	0.79

of the location. Sparsely populated islands are also more diversified, which indicates the decreased options for specialisation on these islands.

It appears that the choice of having a fixed link takes islands down strategically different development paths. Islands with a fixed link forgo the high presence of a retail and tourism industry (which is substantially lower on these islands) and a lower primary sector in exchange for a higher presence of the manufacturing sector and education and health. The percentage of people employed in health and education on fixed link islands is also substantially higher, but this would in the main part reflect national trends in this regard of countries where such islands are located.

The geographic location of islands around the continent has a substantial impact on their economic performance. Islands in the Atlantic, Baltic, North and Norwegian seas have a higher employment rate than those in the Mediterranean Sea and those in the Outermost regions. The Mediterranean and the Outermost islands also share a common high share of public sector employment. Public sector typically ends up as a residual of lack of employment in other areas. Islands in the Mediterranean have the highest level of primary sector employment (together with the Norwegian Sea), however they hold one of the lowest shares of employment in health and education (together with the Atlantic). The retail and tourism sector is particularly strong in the Atlantic and the Mediterranean islands, which typically draw tourists due to their outstanding natural beauty and favourable climate respectively. The statement that the location of the islands does not seem to impact the manufacturing sector holds for all except the Outermost regions. Islands in the Outermost regions and in the Mediterranean Sea are more diversified than those in the remaining seas, an observation which may be linked to the absence of fixed links.

Islands which contain mountainous areas feature two concurrent geographic specificities. The employment rate in islands with mountains is lower, they have a higher proportion of primary sector (including mining) and a slightly higher proportion of people working in the retail and tourism industry. However, the employment in the manufacturing sector is lower. The employment in the public sector is larger in mountainous islands, but that in education and health is lower.

Islands that form part of a larger administration group of islands, termed as archipelagos in this analysis, have higher employment rates, mainly due to higher primary sector employment. They also feature greater employment shares in retail and tourism while there are lower employment levels in the

manufacturing sector. The share of employment in education and health is substantially lower for archipelagos, as they may often rely on the rest of the islands in the administrative unit for the provision of such services.

Islands with a PUSH of less than 100,000 have a higher employment rate which is made up of a higher presence of the primary sector, a smaller secondary sector and lower health and education employment. The ability of islands with a small PUSH to diversify is also limited as exhibited in a higher diversification index.

Islands' size seems to affect the retail and tourism indicator in a non-linear fashion. The islands with the middle range of population size, between 100,000 and 1m, have the largest manufacturing and tourism and retail sectors. This may imply some economies of scale being accrued, which after a certain population size turn into diseconomies, also as increasing population density would potentially limit growth prospects. These results are however strongly conditioned by the performance of Sicily and Sardinia. This pattern is repeated in the proportion of people working in the education and health industry, which are smallest in the mid-sized islands and biggest in the largest islands as well as the diversification index, which is lowest in the mid-sized islands, higher in the largest islands and largest in the smaller islands.

The relationship between the primary sector share of employment and size is a different matter, as the intensity decreases as the population size increases. Islands with less than 100,000 people have the highest share while those with over 1m have the lowest. This relationship is mirrored in the employment in the public sector, with the smallest islands having the smallest share, and the biggest islands with the biggest share.

Land Use

Smaller islands have larger share of agricultural as well as protected areas than larger islands (0). This ties in to the employment trends where small islands display a larger primary sector. They also had a larger share of artificial surfaces than larger islands. This reflects the existence of a minimum level of infrastructure needed within an inhabited island, which would be proportionately higher for islands with smaller areas.

The biggest difference in land use is found between sparsely populated islands and non-sparsely populated islands, as would be expected. Sparsely populated islands have a substantially lower portion of protected, agricultural

and artificial areas. This would imply that islands that face lower population pressure seem to have a lower need for protecting land. This statistic is also affected by the fact that the most densely populated islands are found in the Mediterranean, and these have a higher level of protected areas.

Areas with a fixed link have a lower share of protected areas but a higher share of agricultural areas, which suggest that improved transport networks encourage agricultural use of land. Since the employment in the primary sector is lower on islands with fixed links, this implies that the type of agriculture present on these islands is likely to be non-subsistence agriculture since this features larger land use and smaller labour involvement. They also have a higher proportion of artificial surfaces linked to the higher presence of the manufacturing sector.

Table 26 Land use analysis

	Share of artificial surfaces	Share of agricultural surfaces	Share of Protected areas
Total	2.6%	26.1%	22.6%
Island area < 1000 sq km	3.3%	29.8%	30.8%
Island area > 1000 sq km	2.4%	25.4%	21.2%
Not sparsely populated	4.2%	41.9%	26.7%
Sparsely Populated	0.3%	3.9%	16.9%
No fixed link	2.1%	23.7%	23.7%
Fixed link	5.6%	40.6%	16.3%
Atlantic	1.0%	5.5%	20.3%
Baltic	6.8%	54.2%	17.2%
Mediterranean	3.7%	46.8%	26.5%
North Sea	3.2%	30.1%	20.4%
Norwegian and Barents Seas	0.8%	6.3%	7.8%
Outermost Region	0.7%	5.1%	71.2%
Not mountainous	5.4%	42.7%	17.7%
Mountainous	1.2%	18.1%	25.0%
Archipelago	3.0%	28.7%	41.0%
Not Archipelago	2.5%	25.6%	19.5%
PUSH < 100,000	1.4%	17.6%	24.3%
PUSH > 100,000	8.0%	65.2%	14.9%
Island population < 100,000	2.2%	25.8%	27.0%
Between 100,000 and 1m	1.8%	14.4%	22.5%
Island population > 1m	5.2%	58.3%	18.6%

The geographic location of the islands has a large impact on the share of agricultural and protected areas. Islands in the Baltic, Mediterranean and North Sea have a substantially higher proportion of agricultural land, while islands in the Outermost regions have a substantially higher proportion of protected areas compared to all the other islands. The islands in the Baltic Sea are the ones with the highest artificial surfaces, related to higher presence of fixed links and consequently manufacturing.

Islands with mountains have a substantially lower percentage of agricultural land, although the primary sector is larger on mountains, which implies that a large proportion of this is mineral extraction. This is also related to the difficulties in using land at high altitudes for agriculture and the increased cost of transporting the goods from mountainous areas. Mountainous islands have a lower level of artificial surfaces, indicating the difficulties of construction on mountains.

Islands forming part of a municipality with other islands have twice the share of protected areas than islands with a single or multiple municipalities, while they also have a higher proportion of agricultural land. This is mainly driven by the high protection levels found on islands in the Mediterranean and Atlantic Ocean. This may also indicate that non-self-determining islands may be encouraged more strongly to preserve natural landscapes, as it may be easy for administering bodies to conserve areas that are distant from the administrative centre.

Islands with a PUSH of over 100,000 have more than three times the amount of agricultural land than islands with a PUSH below 100,000. They also have a higher proportion of artificial surfaces, but a lower percentage of protected areas.

Islands with a population between 100,000 and 1m have the lowest share of agricultural surfaces and artificial surfaces. Islands with a population of over 1m have the highest share of agricultural land, and the lowest level of protected areas. This is influenced by the three islands making up this category. Population size does not seem to be compatible with protected areas, as islands with the smallest population size have a larger proportion of protected areas.

Conclusion

This analysis leads to a number of conclusions in relation to the state of and potential for development of islands in the ESPON territories. Islands with a number of obstacles, due to presence of mountains or being part of an

archipelago often appear to exhibit common traits of higher employment rates, which is fuelled by a larger primary sector, most likely related to agriculture or mineral extraction. They also seem to exhibit the tendency to have a higher diversification index, which is a sign of the inability to specialise in a few areas of comparative advantage. This is in line with the findings from the case studies which exposed the need for islanders to be more flexible in order to be able to generate an income throughout the year, as many of the activities undertaken on an island, be it tourism related, or agriculturally related, are highly seasonal and can only provide employment for a portion of the year. Tourism plays an important role in the economy of islanders. This is especially true for the smaller islands and those that are more densely populated.

The Mediterranean Sea is home to the three islands with the largest populations as well as the greatest number of islanders. It has the highest level of ageing population, a small population growth and very few fixed links. Islands in the Mediterranean have large shares of protected areas, and high levels of agricultural land. There is a large presence of agriculture and tourism, as well as high levels of public sector employment. Fixed links make a difference to an island. Islands which have fixed links are likely to have weaker air connectivity. Fixed links are more frequently found in smaller islands with lower population density. There appears to be a strategic development path being pursued through the establishment of fixed links; islands with fixed links have a more developed manufacturing sector but a lower tourism sector than those without fixed links. However fixed links are not automatically related to increasing population rates; a number of islands with fixed links in the North and Norwegian Seas are losing their population. It appears that a fixed link is not a de facto solution to island connectivity problems but rather a tool that can also make leaving the island easier. The establishment of such a link would need to be accompanied by policies that encourage the inflow of people and businesses.

The high diversification, although by its nature a consequence and not a choice of islanders, is potentially a resource that may encourage further development opportunities. This is also true of the higher level of involvement in the agricultural sector that can be exploited for higher value if the focus is shifted into specialised farming, such as organic farming or viticulture. There is evidence from the case study that this is successfully being done in Sicily.

4.1.3 Sparsely Populated Areas

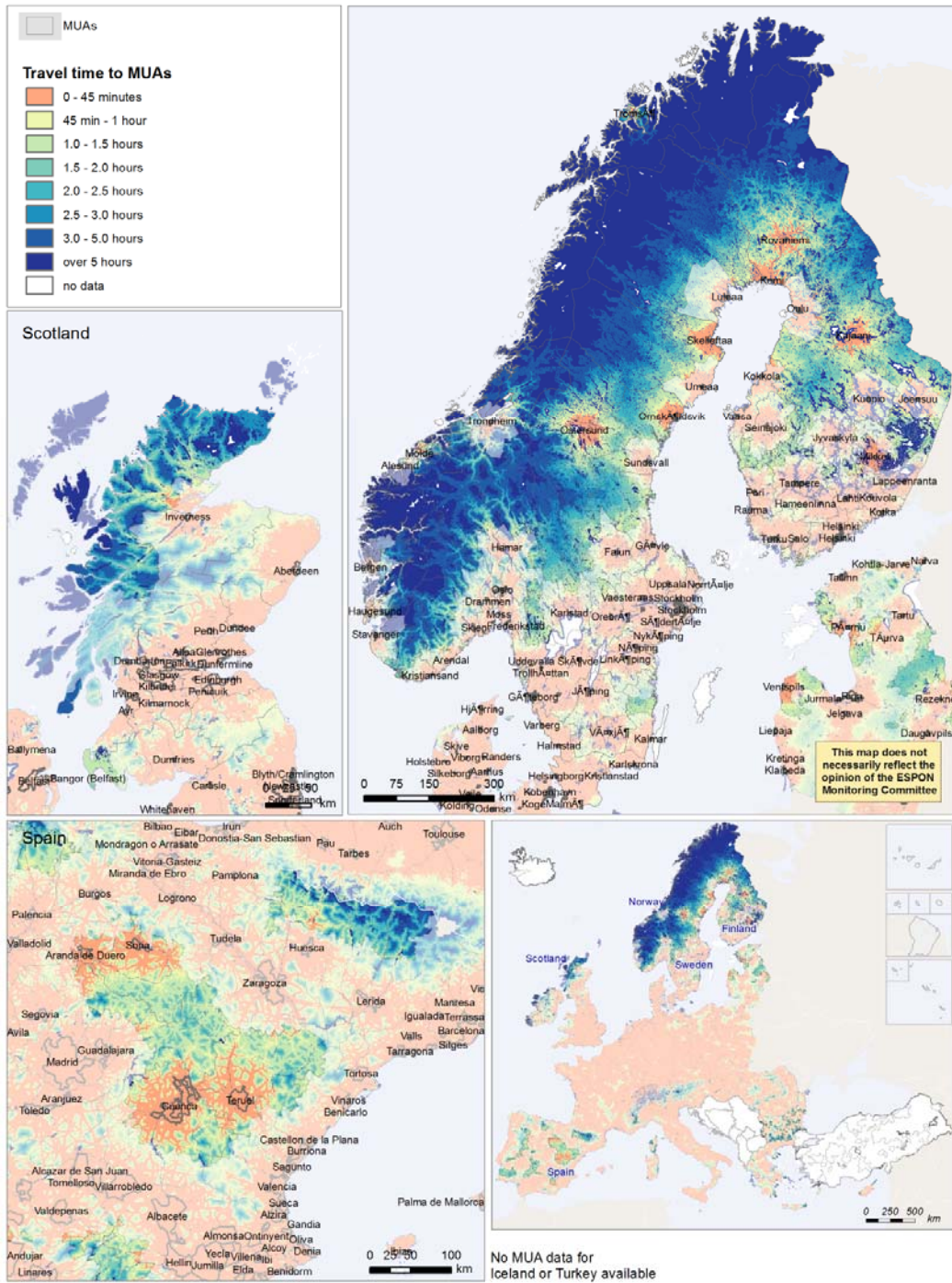
In the GEOSPECS project, Sparsely Populated Areas (SPAs) have been defined and delineated as the areas of Europe that have a relatively low population potential. This definition implies that SPAs cannot be found in close geographic proximity to large agglomerations, i.e. in their commuting catchment area: low population potential is a direct consequence of the long distance to large urban cores. However, parts of European SPAs are in the commuting catchment area of smaller urban cores (Map 35). Hence, the location of SPAs with regard to small or large urban cores is an important characteristic of their territorial context.

Most of the SPAs of the Nordic countries (NSPA) are more than a three-hour driving-distance to the nearest MUA. Moreover, these areas are remote from the main metropolitan areas of these countries, including the capital regions and other agglomerations with more than 500,000 inhabitants (e.g. Gothenburg or Tampere). However, some medium-sized agglomerations are located *at the fringe* of the NSPA, such as Umeå and Luleå in Sweden, Oulu in Finland, and Trondheim in Norway. These mid-sized cities, often endowed with large universities and industries, play an important role as a regional growth centres for the NSPA as a whole. In addition, several mid-sized cities are located *within* the NSPA: Östersund in Sweden, Rovaniemi in Finland, and Tromsø in Norway. Finally, the NSPA includes many smaller towns such as Kiruna and Skellefteå in Sweden, Mikkeli and Kajaani in Finland, and Bodø in Norway.

In Scotland, the SPA is rather remote from the main population concentrations of the Central Belt, which includes Glasgow and Edinburgh. The only MUA close to the Scottish SPA is Inverness. However, only a small proportion of the Scottish SPA is located within one hour of Inverness, mostly along road corridors from Inverness to the North/North-West coast of Scotland.

Compared to the previous two main SPA, the Central Spanish SPA is rather close to large agglomerations, located between the agglomerations of Madrid to the West, Zaragoza to the North, Barcelona to the East, and Valencia to the South. Consequently, and also because there are three small MUA within the area (Cuenca, Teruel and Soria), few places in the Central Spanish SPA are more than 2 hours from an urban core.

Sparsely Populated Areas - Access to MUAs



Map 35 Access to main urban cores from Sparsely Populated Areas

Demography: a vital issue for SPAs

The phenomenon of sparsity results from different territorial factors deriving from the spatial distribution of human settlement across the territory: remoteness from large agglomerations; small and scattered settlements; and extended areas of wilderness surrounding small towns. Yet, as shown above, these factors vary in their importance for structuring of the different SPAs: 'sparsity' in different parts of Europe, for instance in Arctic Europe, Northern Scotland or Central Spain, although equally labelled as SPAs, in fact relates to very distinct territorial contexts.

As the proportion of population actually living in these areas is relatively low, especially compared to their land area, the weight of these areas i.e. in the national political context can be underestimated. The proportion of the national population for the main sparse areas in the ESPON space varies from 2% in Spain to 24% in Iceland (Table 27).

Table 27 Sparse areas: percentage of their respective national land area and population in 2006.

Country	Sparse areas	
	land	population
Spain	17%	2%
Finland	61%	15%
Iceland	92%	24%
Norway	79%	23%
Sweden	59%	8%
Scotland	26%	2%
Numbers refers to the sparse areas %share of the country		

As illustrated by the case studies, most sparse territories (STs) face the demographic challenges of unfavourable age structure and population decrease, mostly due to outmigration. Compared to the situation in their respective countries and to the European average, the STs have a high proportion of elderly people, especially in the Iberian Peninsula where the proportion of young people is also particularly low. In Finland, Sweden and Central Europe, the proportion of elderly people is also high (Figure 17). However, the equally high proportion of younger people improves the potential for labour force replacement. In Iceland, Norway and Ireland, the population is generally younger than the European average. In the Baltic

countries, the interpretation of demographic trends is more complex, due to strong out-migration of the younger working-age population, and the high proportion of young people in the sparse regions has no clear implication for the future labour supply.

Between 2001 and 2006, the population in the ESPON space (excluding Turkey and the Former Yugoslav Republic of Macedonia) grew by approximately 0.4% per annum: a total of 9.8 million persons. In the STs of the ESPON space, the development trend was opposite, with a minor decrease in population. However, population changes did not follow the same trend across the STs. In 2006, 3.2 million people lived in sparsely populated LAU2s: a decrease of 62,600 persons compared to 2001. Over the same period, the poorly connected LAU2s were home for 1.8 million people; and the population in those regions was stable. Thus, distance seems to have a greater negative impact on population trends than accessibility.

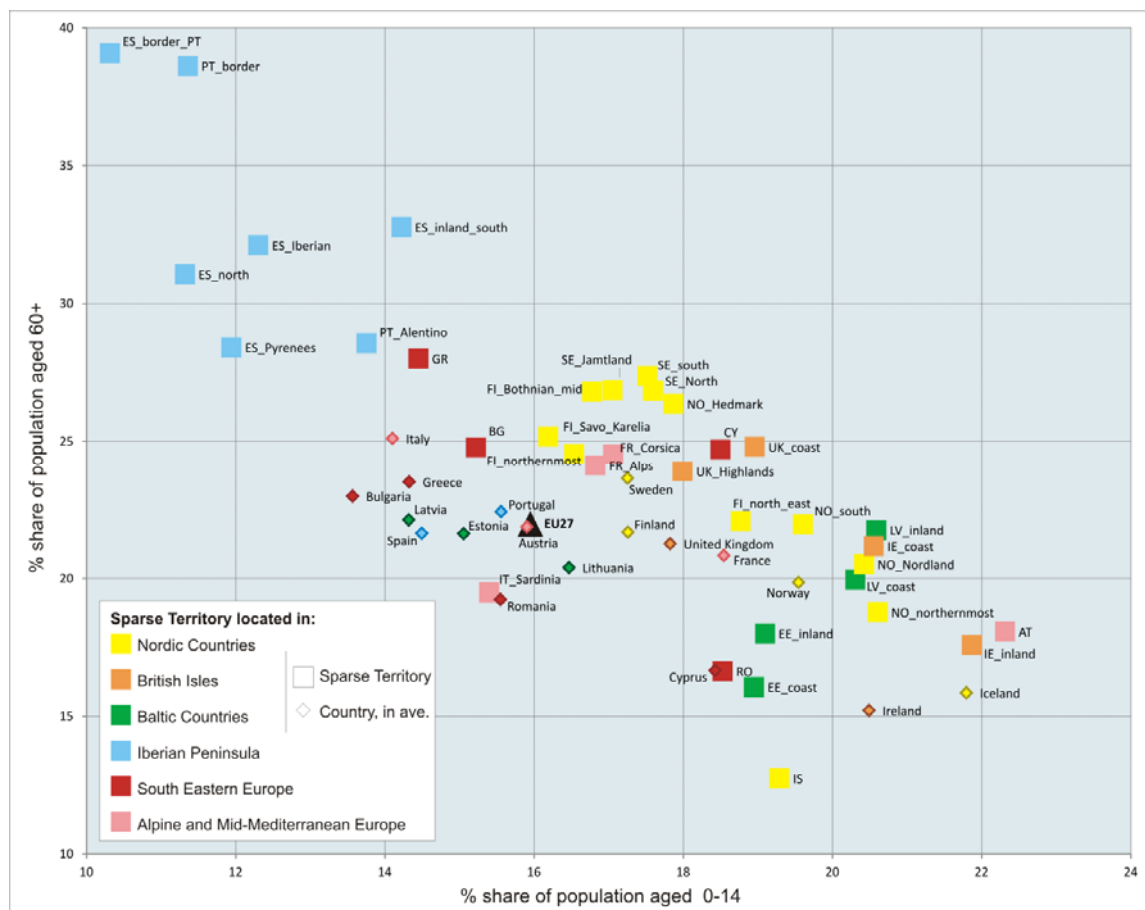


Figure 17 Relationship between the proportion of young and old people in the Sparse Territories and in their respective countries.

Thus, European SPAs show a variety of territorial preconditions, giving them the possibility to take advantage of urban dynamics, with respect to both large agglomerations and small and mid-sized centres, for their local development.

With regard to population change for STs, some broader territorial trends are identifiable. In Northern Europe, the population is decreasing in sparse areas and increasing in dense ones. In Iceland, Ireland and Cyprus, countries that have experienced major population growth in recent years, the total population is increasing in the STs, although not as fast as in the countries on average. In Spain, the smaller STs are experiencing population decreases, while those in the Iberian mountains (Cuenca, Soria and Teruel) and Pyrenees have increasing populations. The Eastern European countries are experiencing overall decline. The other STs show diverse trends. However, whether the overall population development trend is positive or negative, the sparse areas generally perform worse than the more densely populated parts of the same countries.

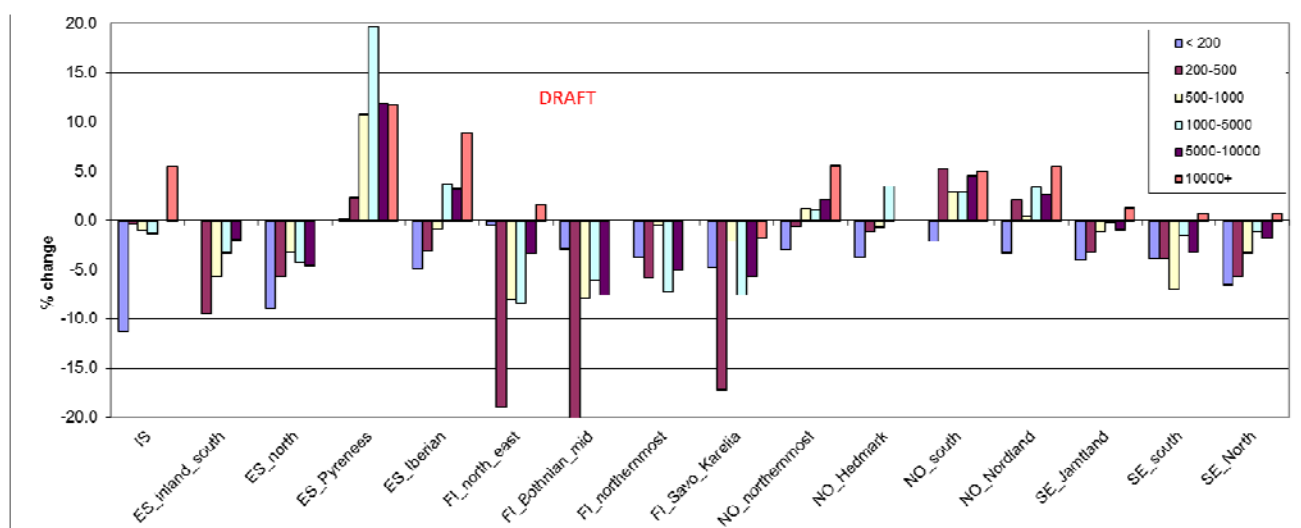
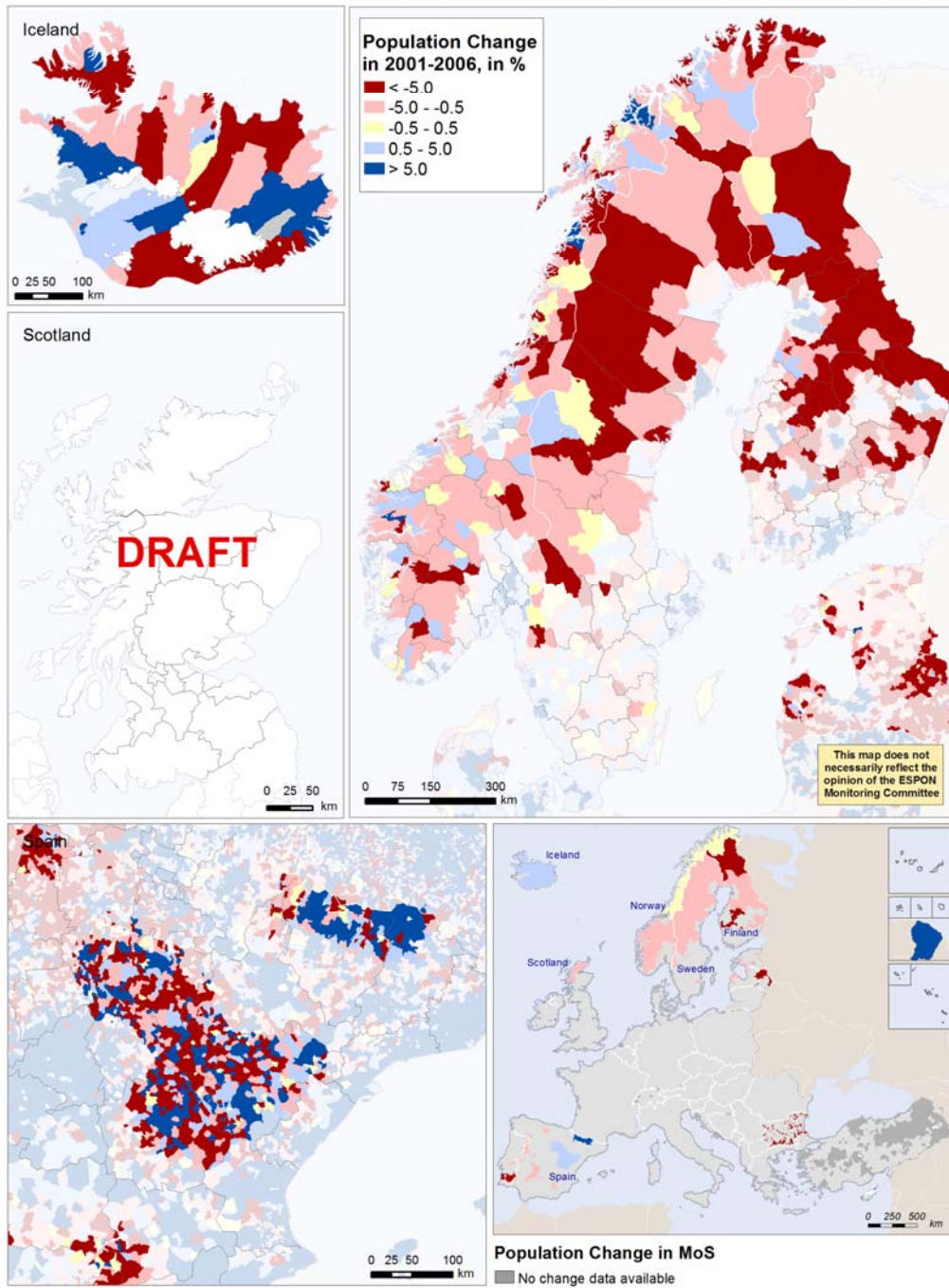


Figure 18 Population change in various sizes of sparse settlement in the largest Sparse Territories in 2006-2011 (ES 2001-2006)

Population Change in Sparsely Populated Areas



Map 36 Population Change in SPAs, 2001-2006

As shown in Map 36, population trends *within* the STs also vary significantly, with identifiable processes of demographic polarisation. To identify these trends, two factors were evaluated: access to MUAs, and the demographic size of the locality. Of these, proximity to MUAs – and thus the average population potential of the LAU2 – does not, as such, have a clear effect on the demographic development. This can be related to the fact that only 16% of the sparse LAU2s are located – at least partly – within potential commuting areas (PUSH) of MUAs and that, in almost 80% of these, the potential is related to MUA with a population below 100,000 inhabitants, so that the regional effect of these MUAs is not very extensive.

On the other hand, the size of the locality does matter. In this case, a locality is a settlement for the Nordic Countries, and an LAU2 unit for the rest of Europe. A settlement is further defined as a built-up area with more than 200 people and less than 50 (Norway) to 200 metres (Finland and Sweden) between the houses. Figure 18 shows the population development in various sizes of built-up areas (LAU2 data for Spain) within the largest STs. In almost all STs, the largest settlements either have an increasing population or have the best demographic performance in other terms, and the areas around settlements or settlements with less than 500 inhabitants have the greatest population decrease or worst performance.

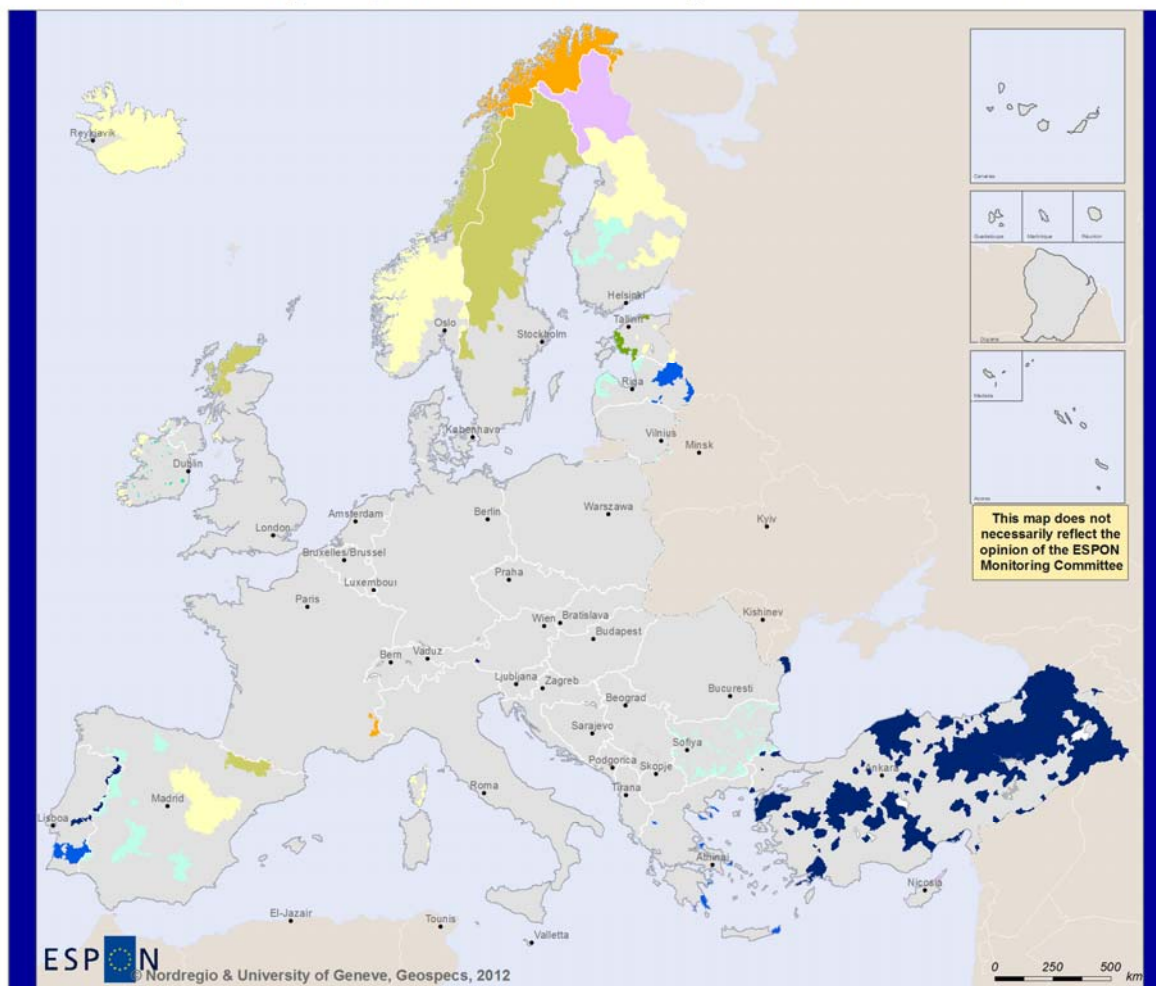
Is there a generic labour-market profile for the SPAs?

SPAs throughout Europe show a variety of economic profiles; no single type of regional economy is engendered by sparsity. An initial overview of the variety of these profiles can be provided by considering the employment profile of the SPA according to the three sectors of activities (primary, secondary and tertiary), using the STs as analytical units (0).

Several STs – in Southern Norway, Mid and Eastern Finland, Iceland and Central Spain – have profiles that are relatively close to the European average (primary: 9%; secondary: 26%; tertiary: 65%). Another common profile, characterised by a slightly larger proportion of persons working in the secondary sector and correspondingly fewer in the primary sector, can be found in Mid- and Northern Sweden, Mid-Norway, the Highlands and Islands (Scotland) and the Pyrenees. STs with a strong or very strong overrepresentation of employment in the primary sector can be found in the Western and Southern parts of the Iberian Peninsula, South-Eastern Europe (Greece, Bulgaria, and especially Turkey), and Eastern Latvia.

The simple three-sector approach shows that, even if there is no single economic profile across the range of SPAs, there seem to be signs of geographic inertia, i.e., ST located in the same 'corner of Europe' tend to have similar economic profiles. To investigate this issue further, a factorial analysis using NACE 1-digit data at the ST level was undertaken. This confirms that SPAs within one macro-region, i.e. a large territorial ensemble, tend to share a similar economic profile, which differs from that for SPA in other parts of Europe (Figure 4). For example, SPAs in the Iberian Peninsula have quite similar profiles, with a relative over-representation of employment in hotel and restaurants (i.e. services to tourists) and construction. Similarly, for SPAs in the British Isles, the Figure 5: Labour-market profiles in Sparsely Populated Areas related to the EU27 average

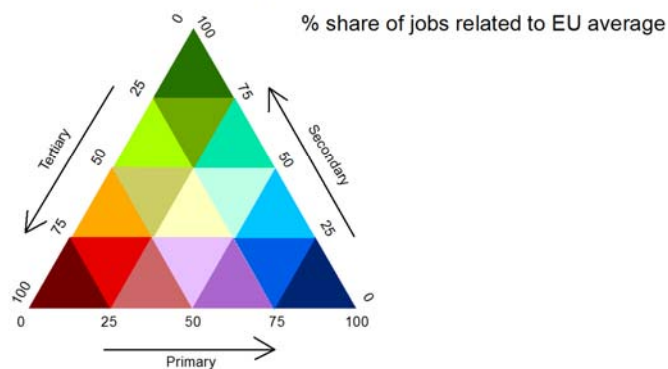
Employment structure in Sparsely Populated and Poorly Connected areas



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Regional level: other
Source: ESPON Database 2013
Origin of data: Eurostat, NSIs, University of Geneva
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Classification in triangular diagram made with Phlcarto

Classification of the areas according to their proportion of employees in the three main sectors



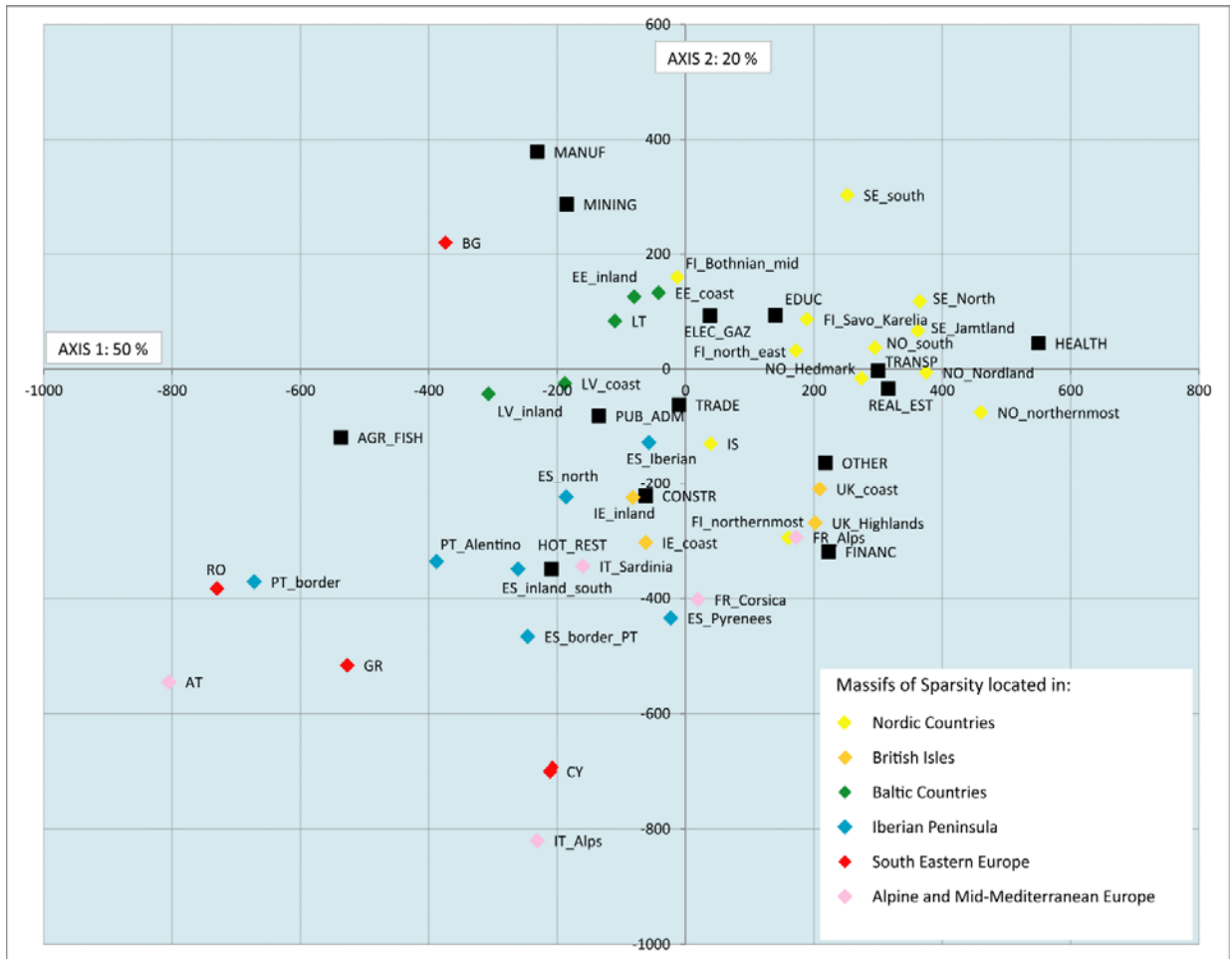


Figure 19 Economic specialisation of the Sparse Territories

Baltic countries and the Nordic countries, the relative importance of employment in the different branches is similar.

Thus, the analysis of the employment structure in the SPAs suggests why an approach to regional economic development based on geographic specificity provides an added value in the debate on territorial and local development, especially when combined with a macro-regional approach. Within such broad European macro-regions, sparse territories have developed rather similar economic structures and profiles because they are, on one hand, subject to similar territorial preconditions and, on the other hand, the object of similar types of public policies and initiatives.

Resource-based economies caught between economic growth and environmental protection¹⁰⁷

The exploitation of natural resources remains important in the regional economies in SPAs. Although the dominance of such activities is less important in terms of employment, due to modernisation and rationalisation processes in those industries, they are still an important in terms of wealth generated (e.g. GVA) and of maintaining the regional social capital. This aspect has been further described in the three SPA case studies of Torne Valley, Highlands and Islands, and Central Spain.

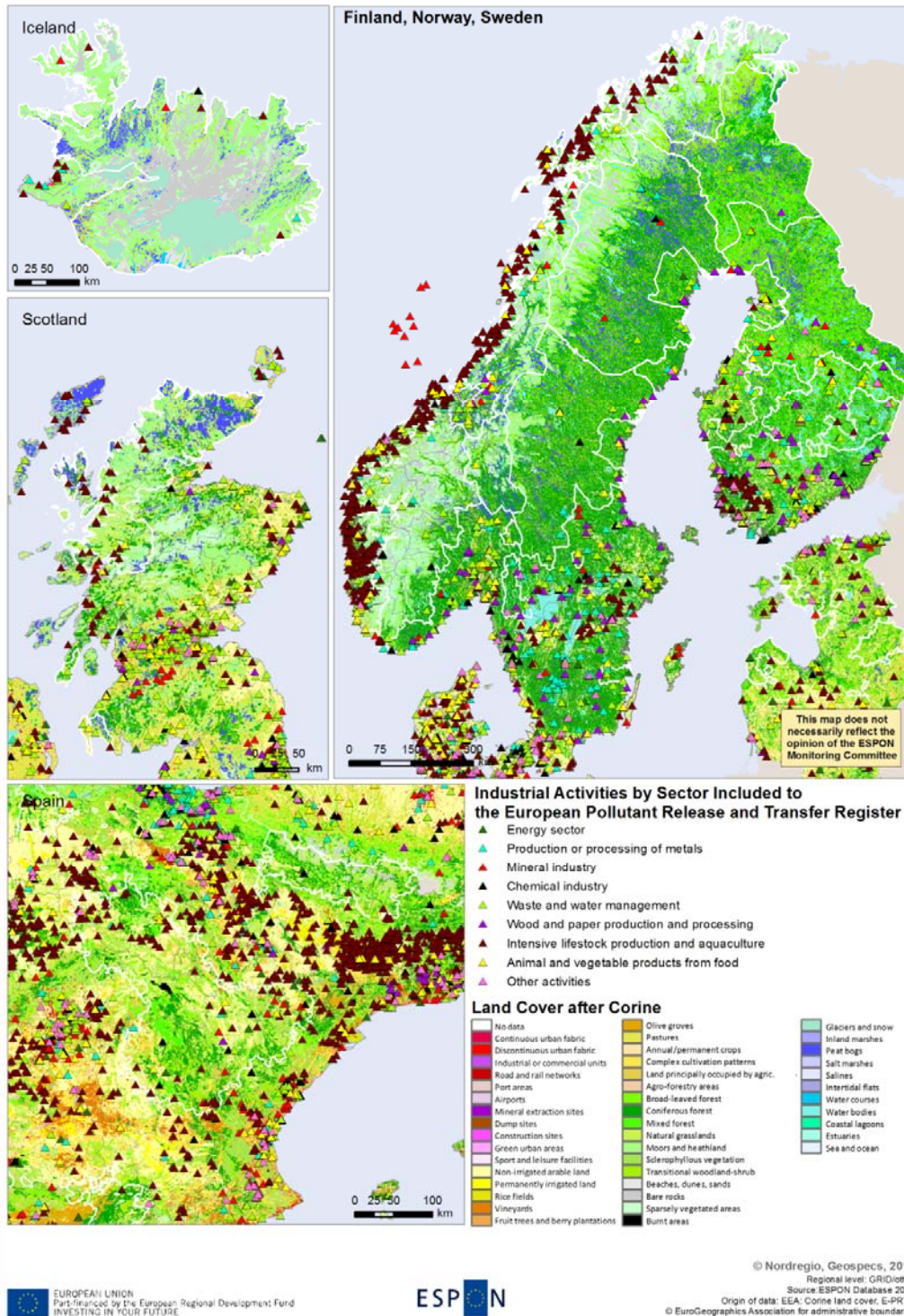
This resource-based development enables local and regional economies to develop a medium- or long-term perspective for their regional development. However, these activities often have environmental impacts with regard both to the methods employed for extraction or production, and to the residues and waste produced by these activities that need to be stored or treated. In SPAs, two main types of such activities can be distinguished. First, activities such as fishing, intensive livestock production and aquaculture, if not highly polluting when taken individually, may have a strong – if diffuse – impact on the environment, as they are often numerous and concentrated geographically. This is particularly evident for the Norwegian coast (aquaculture), the Scottish Highlands (livestock) and, to a lesser extent, the northern part of the Central Spanish SPA (livestock). Second, activities in the mineral and chemical industries and the processing of metals are less numerous and less concentrated geographically (Map 37). However, each plant has a much greater impact on the environment. This is the case in the Swedish and Finnish SPAs, which have specialised in such activities for decades. These activities engender more localised types of environmental impacts.

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The section uses data of the European European Pollutant Release and Transfer Register (E-PRTR). The E-PRTR is the new Europe-wide register that provides easily accessible key environmental data from industrial facilities in European Union Member States and in Iceland, Liechtenstein, Norway, Serbia and Switzerland.

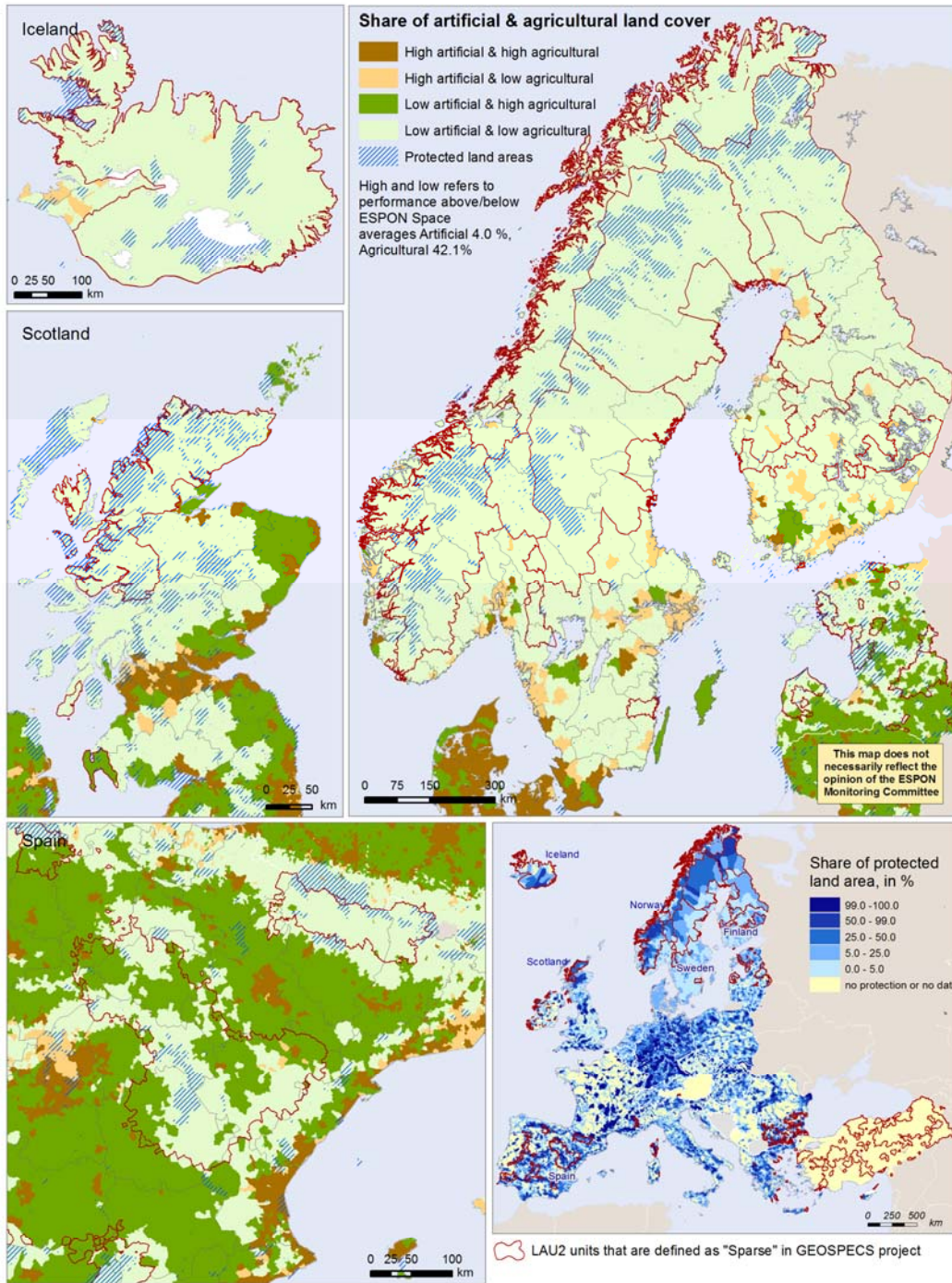
<http://prtr.ec.europa.eu/Home.aspx>

Land Cover & Industrial Activities



Map 37 Location of activities included in the European Pollutant Release and Transfer Register in the four main European regions with SPA

Land Cover and Nature Protection



Map 38 Proportion of agricultural and artificial land, and protected areas in Sparsely Populated Areas

This tension between resource-based development and the preservation of the environment also challenges the capacity of local and regional economies based on the former to develop activities that are based on high environmental quality, such as forestry or tourism, which is often linked to the relatively 'pristine' or 'wild' ecosystems and landscapes: for instance, much of the NSPA is described as Europe's last wilderness. Thus, a decision to follow an amenity-led development path might jeopardize the long-term potential for other types of activities.

There is therefore a complex and, to some extent, paradoxical relationship between the need to develop human (and industrial) activities in SPAs and to protect the environment. As shown in Map 38, the proportion of artificial and agricultural areas in the land cover of SPAs is low. This is, of course, directly linked to the nature and history of human development in the SPAs, particularly in northern Europe: the low quality of the land and/or climate for agriculture led to few people settling there before the Industrial Revolution, which engendered a lack of critical mass to benefit from the agglomeration economies of the industrial era, thus create self-reinforcing patterns of demographic sparsity. These characteristics lead to the environmental protection paradox of the SPAs: because human activities are not an urgent threat to the quality of the environment, fewer areas have been designated as protected areas than in more central parts of Europe (e.g., Germany, the Netherlands) where the pressure of human activities on the environment is greater. There is therefore more space available for the development of economic activities that may have an impact on the quality of the environment.

Summary and conclusions

SPAs share many *similarities* in terms of territorial development challenges and opportunities. Yet, as the above analysis shows, it appears that many of these issues are not the *same* across the spectrum of European SPAs.

This section has emphasised the features of territorial development that are of most importance for fostering local development in the SPAs: access to urban cores; territorially and structurally unbalanced demographic development; the role of resource-based development in economic growth processes, and the resulting impacts on the environment and other activities which depend on a high-quality environment.

Some SPAs are on the edges of agglomerations with populations of many millions, while others have only access to smaller local and regional centres.

Yet all SPAs suffer from lack of access to employment and service centres due to either inadequate transport infrastructure or physical remoteness.

Some SPAs have witnessed overall population growth, while others have suffered from steady population decline. Yet all are witnessing processes of demographic polarisation towards urban centres – either within the area, nearby, or further away.

Some SPAs have resources that can assure the welfare of their population for decades, while others only have limited production prospects. Yet the long-term sustainability of local economic growth strategies based on both environment-friendly activities and those with environmental impacts may lead to conflicts of interest.

The analysis shows that, for each of these issues, there is no *generic* way to describe how different SPAs are affected by them. This means that policy initiatives aiming to foster territorial development in SPAs cannot be generic. Yet such policies should aim to:

- strive for the development of 'regional' economic strategies based on cooperation within Sparse Territories, where significant synergies can be drawn upon, while some flexibility exists for local economies to find their own competitive advantage;
- develop strategies enabling the expansion of economic and labour-market interactions within Sparse Territories, supported by adapted transport infrastructure and networking initiatives across (regional and/or local) administrative boundaries;
- foster the development of economic activities moving the economies of SPAs “up the value chain”, enabling the combination of traditional industries with more refined processing of products.

4.1.4 Coastal areas

Within the GEOSPECS project, coastal zones have not been delineated as a fixed area because coasts are not only highly dynamic in terms of their natural environment, but display a variety of social and economic patterns at different geospatial scales. In order to capture socio-economic developments and trends that are influenced by their proximity to the sea, GEOSPECS considers coastal areas within commuting distance to the sea (e.g. 45 minutes, 90 minutes) and for LAU 2 that are contiguous to the sea (see Map 39).

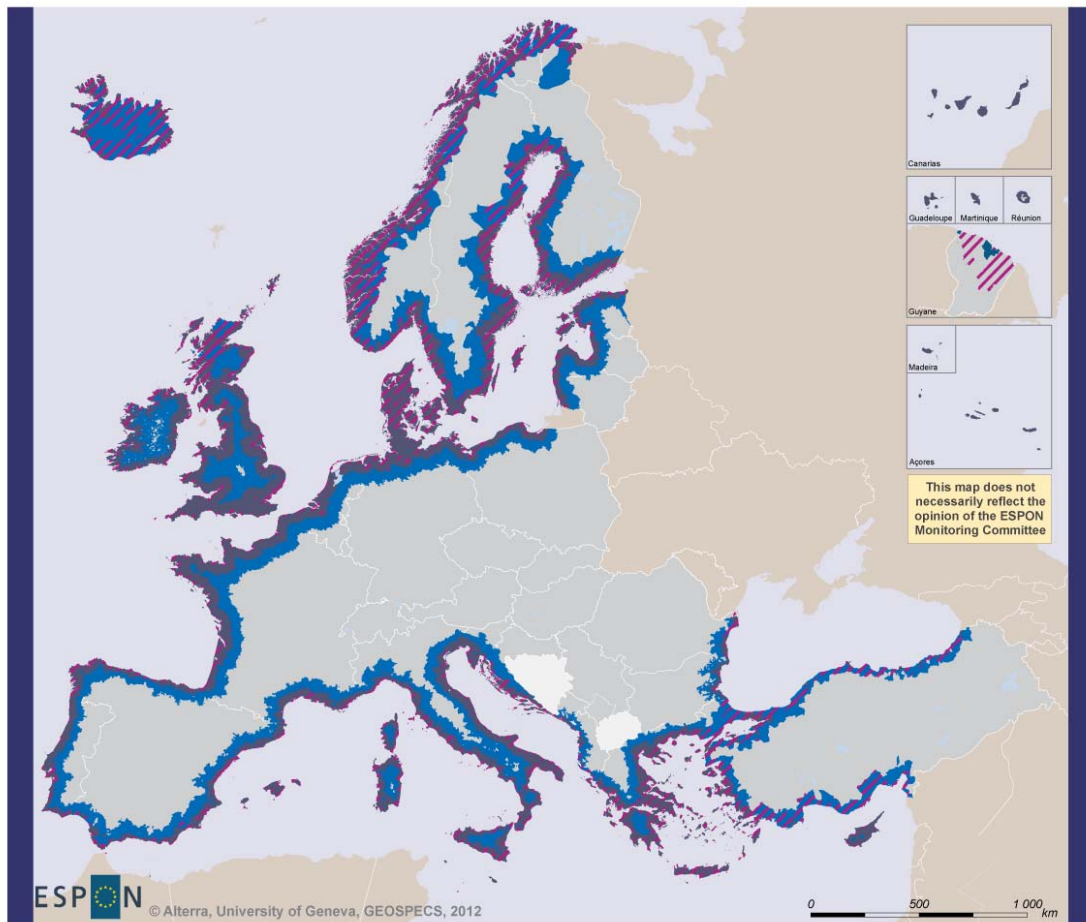
Coastal Population Density

Coastal areas are generally perceived as desirable places to live because of their residential attractiveness, combined with the historic socio-economic development of cities around ports and landing points. In 2006, 177 million people (34.1%) lived within commuting distance (45 minutes) of the coast in the European Union, and 182 million (35.1%) in ESPON space (excluding Montenegro) (Table 28). In general, coastal population densities in the ESPON space are higher than inland population densities.

Table 28 Population densities in coastal areas and the inland in ESPON space

Distance to coast	ESPON space*				
	Area (km ²)	Population 2001	Population 2006	Pop. Density 2001	Pop. Density 2006
45 minutes + contiguous	1 337 500	177 440 000	182 230 000	145	149
Between 45 and 90 minutes	757 800	56 320 000	60 560 000	74	80
90 minutes + contiguous	1 979 700	233 760 000	242 800 000	118	123
Other areas	3 059 700	260 590 000	276 210 000	85	90

*excluding HR, TR, MK




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Regional level: LAU2 (except Turkey LAU1)
 Source: GEOSPECS, 2012
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Classification of LAU based on average distance to the coastline



Map 39 LAU2 within 45 minutes and 90 minutes travel distance from the coastal and contiguous to the coastline.

However, these high numbers are not equally distributed along the coasts: there is a considerable variation, from very densely populated coasts to sparsely populated coasts (Figure 20) as well as large areas of uninhabited coast. There are also differences between coastal population densities according to country (Table 29). Some regional seas have densely populated areas, including coastal megacities such as Barcelona (see Map 41), one of the most densely populated cities in Europe, located on the Spanish Mediterranean Sea. However, the same regional seas also contain coastal LAUs that are classified as Populated Area (SPAs) according to GEOSPECS criteria (see Figure 20 ES_ Mediterranean - Spanish Mediterranean Sea). The proportion of coastal LAUs that are also classified as SPA varies dramatically: from coastal areas with a very small percentage of SPAs to others where the majority of the LAUs are also within SPAs, e.g. all of Iceland's coasts (see Figure 20 all LAUs with country code IS) and most of the Norwegian coast (see Figure 20 the LAUs with country code NO).

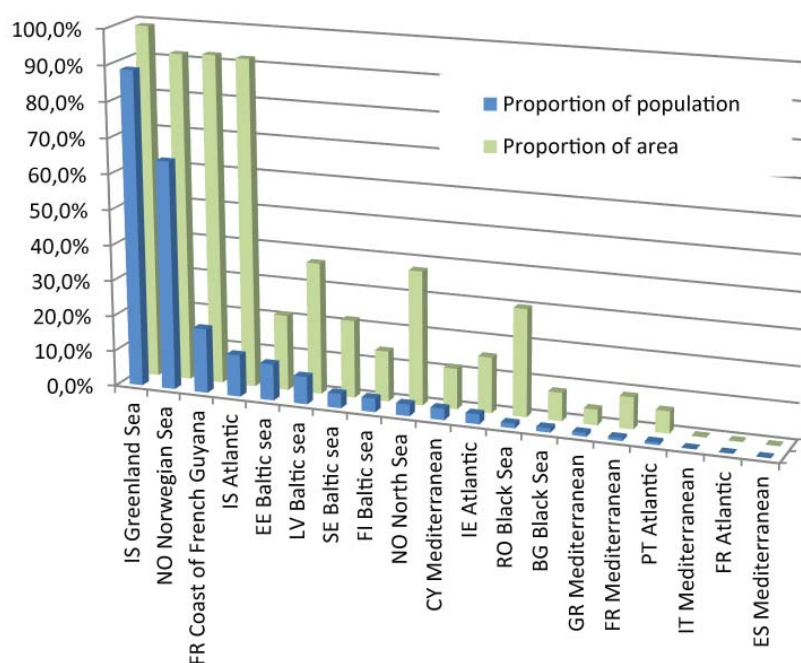


Figure 20 Percentage of population and area in coastal SPA municipalities

Percentage of population and area in sparsely populated areas in LAU 2 within 45 minutes from the coast, by coastal region (country and regional sea).

Coastal population densities also vary from country to country (Table 29), which may reflect, to a certain extent, a country's overall population density.

Table 29 Population densities in coastal areas (LAU2 at less than 45 minutes from the coast or contiguous to the coast)

Code	Country	2001	2006
AL	Albania	-	211,4
BE	Belgium	487,6	496,4
BG	Bulgaria	154,6	154,7
CY	Cyprus	78,5	89,4
DE	Germany	204,1	206,0
DK	Denmark	124,7	143,4
EE	Estonia	57,1	55,8
ES	Spain	298,3	333,8
FI	Finland	53,8	55,2
FR	France	120,2	127,3
GR	Greece	115,8	119,3
HR	Croatia	84,4	-
IE	Ireland	86,1	94,3
IS	Iceland	3,4	3,6
IT	Italy	263,4	269,5
LT	Lithuania	98,8	91,4
LV	Latvia	84,9	82,6
ME	Montenegro	-	49,5
MT	Malta	1251,1	1283,8
NL	Netherlands	537,9	549,2
NO	Norway	21,0	21,6
PL	Poland	178,1	178,9
PT	Portugal	323,7	319,7
RO	Romania	112,1	117,1
SE	Sweden	55,3	56,9
SI	Slovenia	86,6	88,7
TR	Turkey	247,6	-
UK	United	263,4	251,6

Table 30 draws attention to the diversity of the urban coasts, where most of the coastal population in countries such as Belgium, United Kingdom and the Netherlands (country code BE, UK, NL) live within commuting distance of a metropolitan area, some of which located directly on the coast (e.g. London, UK). However, there are differences between these examples when examining the percentage of the coastal area within commuting distance e.g. in Belgium, there is a dramatically higher percentage of coastal area overlapping with commuting distance to the metropolitan areas.

At the other end of the spectrum are a number of coastal countries that either do not have large metropolitan areas with more than 750,000 inhabitants or where these areas are not located within a commuting distance of 90 minutes to the coast. However, in most coastal countries, a large proportion of their coastal population lives in commuting distance of a large urban area (more than 100,000 inhabitants), though these do not necessarily show similarities when examining the coastal area that falls into that commuting distance e.g. Germany (93.6% of population, area of 85.4%) in contrast to Slovenia, with a similarly large percentage population of 90.6 % but an area of only 63.5%.

Table 30 Proportion of coastal areas in commuting distance from PUSH

Country	Within commuting distance of metropolitan area		Within commuting distance of large urban area	
	Population (2006)	Area	Population (2006)	Area
BE	93,9%	91,6%	100,0%	100,0%
UK	72,9%	32,4%	94,5%	61,8%
NL	70,6%	47,4%	99,8%	98,6%
DE	60,7%	34,5%	93,6%	85,4%
PT	59,3%	19,8%	79,5%	48,1%
GR	50,3%	8,1%	63,0%	20,9%
IT	42,2%	17,9%	91,6%	71,7%
FI	40,6%	6,0%	65,2%	19,3%
PL	40,0%	14,4%	82,8%	61,5%
IE	39,4%	6,6%	66,7%	23,9%
DK	38,3%	12,3%	85,7%	67,7%
FR	37,8%	15,2%	87,0%	62,5%
ES	36,5%	9,8%	88,9%	59,8%
SE	35,4%	4,9%	69,8%	28,7%
NO	26,0%	1,6%	56,5%	5,5%
BG	0,0%	0,0%	67,5%	34,7%
CY	0,0%	0,0%	86,4%	66,2%
EE	0,0%	0,0%	56,7%	9,7%
IS	0,0%	0,0%	0,0%	0,0%
LT	0,0%	0,0%	0,0%	0,0%
LV	0,0%	0,0%	66,8%	20,0%
ME	0,0%	0,0%	0,0%	0,0%
MT	0,0%	0,0%	92,3%	78,2%
RO	0,0%	0,0%	74,2%	25,6%
SI	0,0%	0,0%	90,6%	63,5%

Proportion of coastal areas within 90 minutes from the coast and within commuting distance (45 minutes) of a metropolitan area or a large urban area

Metropolitan area defined as a functional urban area with a population of more than 750 000 inhabitants.

Large urban area defined as a functional urban area with a population of more than 100 000 inhabitants.

Economic development and population density

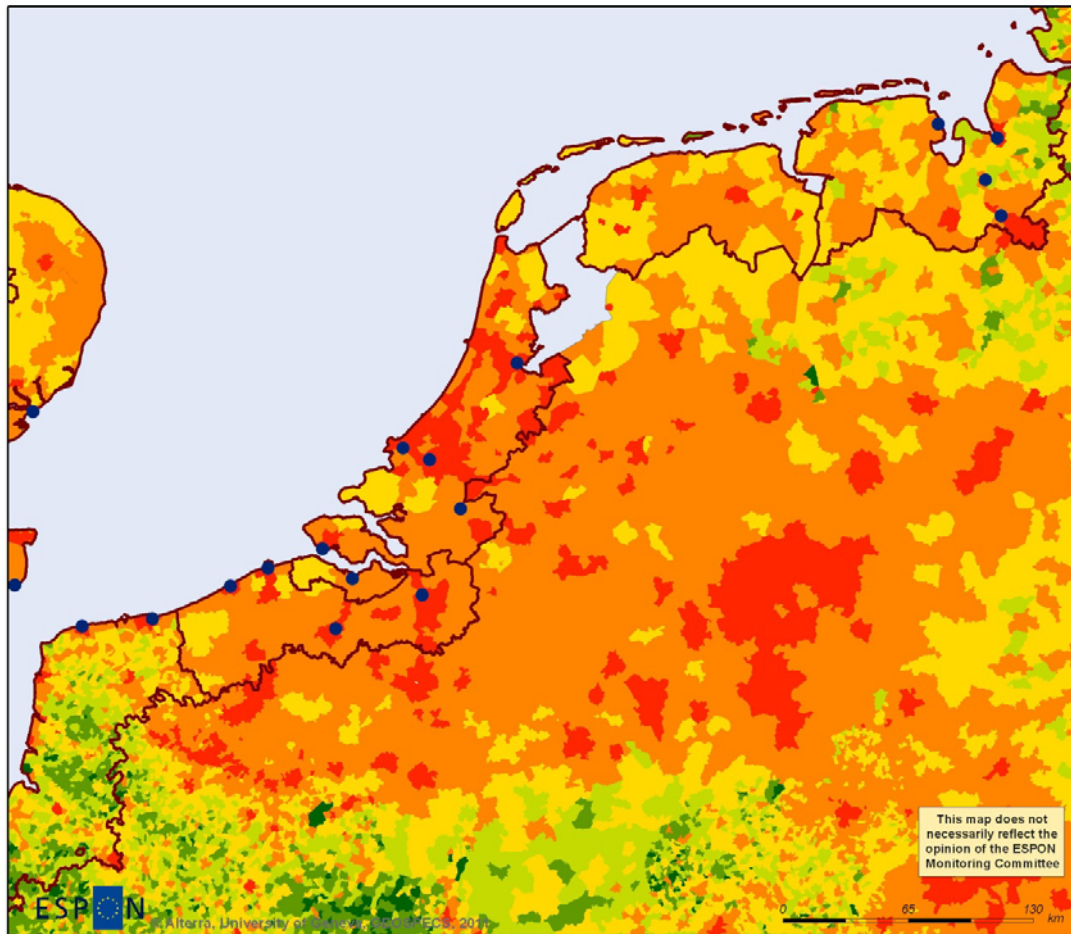
Many coasts are host to a vast array of economic activities: shipping, transportation, heavy industry, aggregate and mineral extraction, aquaculture and fisheries, renewable energy, leisure and tourism. Economic activity along the European coastal zone, however, is highly variable (Cummins et al., 2004). In areas of high concentration of activity, factors such as high population density and access to key infrastructure are more likely to attract industry. Such developments can be seen in Map 40, where the North Sea Coast of Belgium and the Netherlands is characterised both by high population density and a large number of large cargo ports (>4 million tonnes in 2009), showing elevated economic activity. According to the literature, the industrial profile of a coastal region can be influenced by a number of factors including land and property value, access to labour and the residential profile (Rodríguez, 2001). These factors also significantly affect the local economy.

Coastal areas with high economic activity combined with high population densities can also suffer from urban sprawl, e.g. Barcelona, has a high percentage of artificial surface per square kilometre land area indicating the large spatial extent of urbanisation (Map 41). In some cases, the coastal location of a settlement has accelerated such urbanisation in combination with relaxed planning laws, where increased in-migration to the area occurred due to an intensive tourism industry and perceived residential attractiveness, e.g. in Barcelona (Dura-Guimera, 2003; Map 41). Urbanisation and an increase of artificial surface area, although not a specifically coastal phenomenon, can be found in coastal areas of most regional seas. However, countries with a low population density tend to have a high percentage of artificial surfaces per square kilometre at localised coastal hotspots which are not very large. These hotspots correspond with the areas of highest population density in those countries: their capital cities e.g. Dublin in Ireland, Oslo in Norway or Helsinki in Finland. In very densely populated countries, a relatively high amount of artificial surface area can be found over widespread areas on the coast and further inland (see Map 41: Belgium and Netherlands North Sea Coast), i.e., there is no pronounced difference or coastal pattern. However, Table 31 shows that most coastal countries, including Belgium have a higher amount of artificial surface area in the coastal LAUs (on the coast) compared to the coastal area that includes the 45 minutes commuting distance from the actual coastline. Again, there is a spectrum of variation. Along a number of coastlines, this difference is quite clear e.g. Belgium North Sea, French North Sea, Slovenian Mediterranean

Sea, German North Sea, French Atlantic, Dutch North Sea and German Baltic Sea. However, for the majority of coastal regions, the difference is not as pronounced, but can be detected; and only a smaller number of coastal areas show the opposite pattern, namely the Estonian Baltic Sea, Spanish Atlantic Areas, Irish Atlantic and Greek Mediterranean.

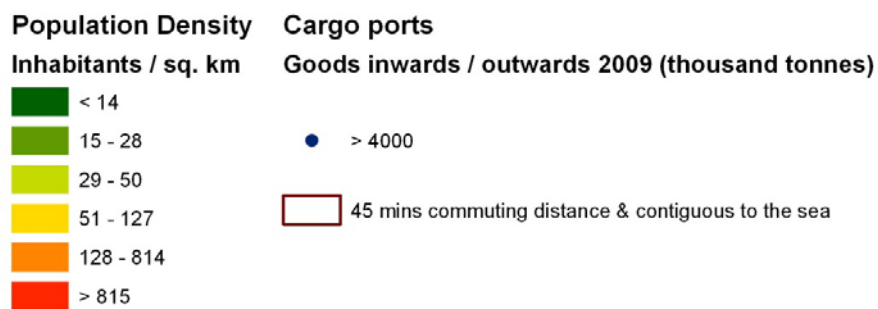
Table 31 Artificial surfaces in coastal municipalities

Coastline	Percentage of land cover grid cells classified as "artificial surface"		Difference (percentage points)
	In coastal LAU2	In LAU2 within 45 minutes from coast	
BE_northsea	39,4%	3,4%	36,0
FR_northsea	23,0%	3,2%	19,7
SI_meditsea	21,4%	6,4%	15,0
DE_northsea	17,0%	4,3%	12,8
FR_atlantic	14,5%	3,5%	11,0
NL_northsea	14,7%	3,8%	10,9
DE_baltsea	15,5%	4,6%	10,9
FR_meditsea	12,4%	4,4%	7,9
CY_meditsea	12,8%	6,7%	6,1
PT_atlantic1	11,2%	6,4%	4,8
LV_baltsea	7,6%	3,0%	4,7
DK_baltsea	7,4%	2,9%	4,5
LT_baltsea	8,1%	3,8%	4,3
IT_meditsea	8,9%	5,3%	3,7
DK_northsea	6,1%	2,8%	3,3
SE_northsea	6,4%	3,5%	2,9
ES_meditsea	10,1%	7,7%	2,4
FI_baltsea	5,3%	3,5%	1,8
BG_blacksea	11,3%	9,7%	1,7
RO_blacksea	4,6%	3,9%	0,7
SE_baltsea	3,5%	3,5%	0,0
EE_baltsea	3,3%	3,8%	-0,5
ES_atlantic (Gulf of Cádiz)	5,9%	6,6%	-0,7
ES_atlantic (Bay of Biscay)	8,3%	9,4%	-1,0
IE_atlantic	3,0%	6,4%	-3,4
GR_meditsea	2,4%	7,0%	-4,7



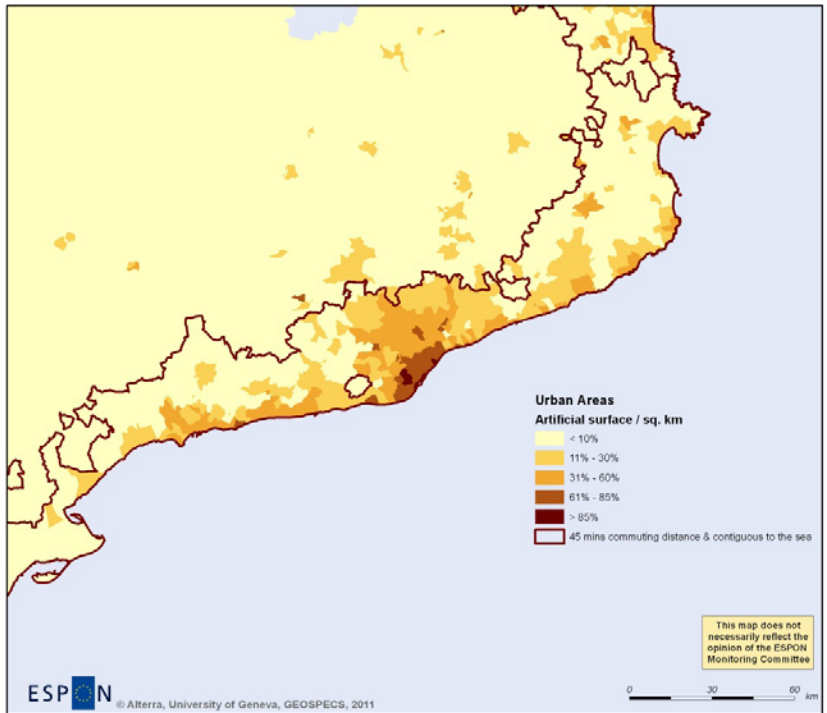

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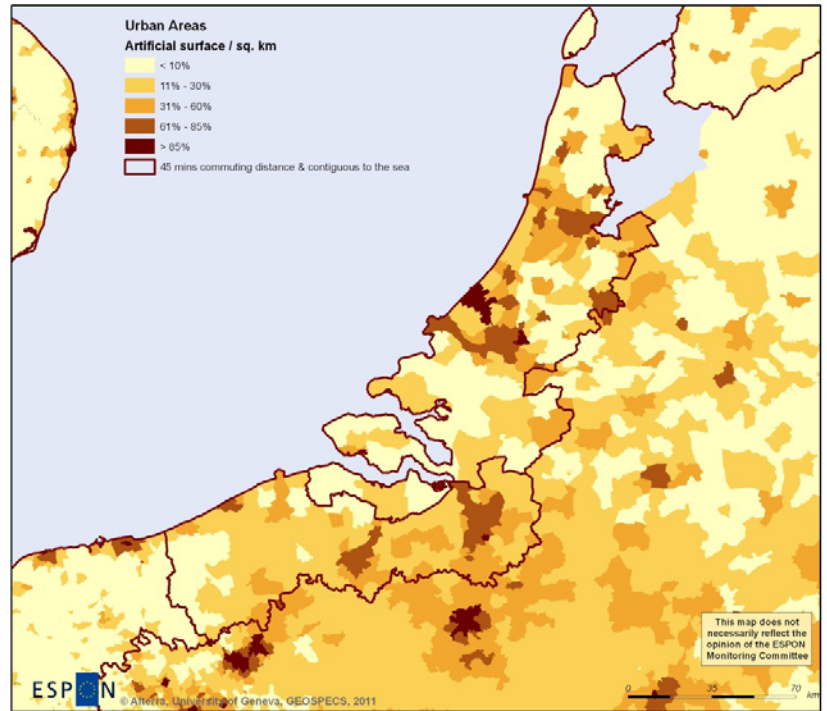
Map 40 Population density and large cargo ports

Population density and large cargo ports (> 4 mill. tonnes of goods transported inwards and outwards in 2009 in the North Sea Coastal areas of Belgium and the Netherlands).



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Map 41 Artificial surfaces in Mediterranean and North Sea coastal area

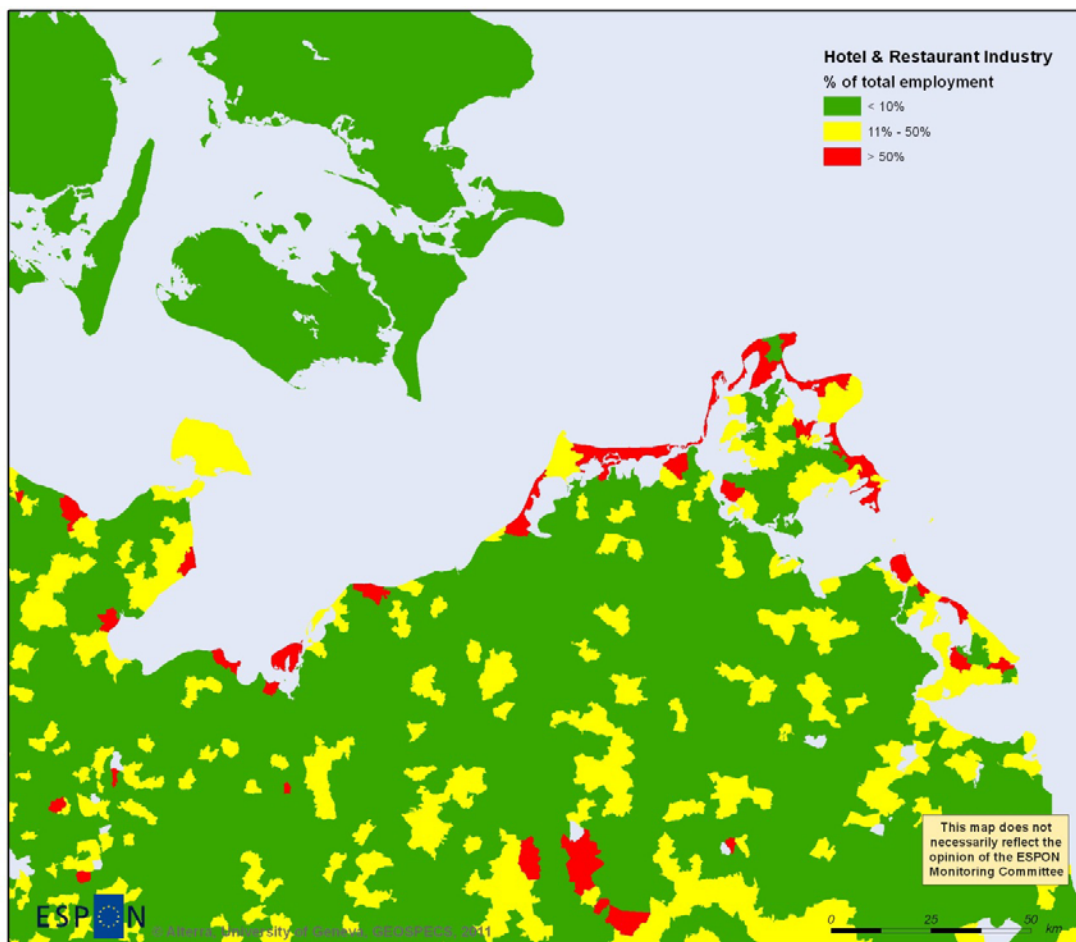
Employment and Tourism

Many coasts are dynamic places in terms of employment, especially as employment trends depend not only on the pervading economic climate but on seasonal trade (e.g., coastal tourism). The structure of employment in coastal regions is not uniform. For example, the agricultural sector accounts for 32% of jobs in Romanian coastal regions, and only 2% in Swedish coastal regions (Eurostat 2010). Unemployment rates are also highly variable in coastal regions. In half of Belgian coastal regions, the unemployment rate is 0.56 times that of the national level, while in Romania it is 1.7 times higher on the coast than nationally. Nevertheless, proximity to the sea is not necessarily the discriminating geographical factor for relative levels of unemployment, which are predominantly determined by the state of individual national economies (Eurostat 2010).

As shown by the deviation between proportions of employment by branch in LAU2 that are contiguous to the coast, within 45 minutes from the coast and the national average value (see Annex 47) there is no general "employment profile" from either a European or a national perspective. Some coastal areas have a strong overrepresentation of the fisheries sector compared to national average values (e.g. Gulf of Cádiz in Spain, Iceland). Only the Danish and French coastal areas along the North Sea have a significant overrepresentation of the manufacturing sector, while transport and storage activities are most over-represented along the coastlines of Slovenia, Cyprus and Belgium.

Coastal areas worldwide are a major destination for tourism, which is one of the fastest growing sectors of the global economy (Creel, 2003). Pressures on the coastal and marine environment and/or way of life can be seasonal and vary significantly in intensity across the EU coastal regions. Good weather in combination with cultural/traditional lifestyles are major factors responsible for increasing numbers of tourists to an area (Rodríguez, 2001). Much of the seasonal employment in coastal areas is in tourism. At a European scale, mountain areas show a more dramatic pattern for the service industry, indicating areas where employment related to tourism is highest. Such differences occur because most coastal regions, in contrast to many mountain areas, also offer employment in other sectors e.g. fishing or port-related activities. However, there is an extremely high percentage of employment in the service industry (Hotel and Restaurant – NACE category H) on the coastline of the Baltic Sea coast (Map 42), indicative of high employment in the tourism industry of some coasts. The figures in Table 32

support this observation: for almost all coastal areas, where data is available, the percentage of employment in NACE Category H is higher for coastal LAU2s than LAU2s within commuting distance of the coast – with exception of the Bulgarian Black Sea and the Dutch North Sea coastal areas where there was no difference. Some coastal areas show again a more dramatic pattern e.g. Cyprus and Slovenia. Such patterns can be explained by the desire of tourists to spend their vacation directly or very close to the actual coastline because of the sea views and to take part in recreational activities that directly involve the sea and/or are close to the sea.



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Regional level: LAU2 (except Turkey LAU1)
Source: GEO-SPECS, 2011
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except Western Balkans and Turkey (national sources)

Map 42 Hotspots of employment in the service industry in Baltic Sea Coast of Germany

Table 32 Proportion of employment in tourism

Coastline	Percentage of employment in Hotels and Restaurants		Difference (percentage points)
	In coastal LAU2	In LAU2 within 45 minutes from coast	
ES_Canary islands	17,25%	-	-
CY_meditsea	11,50%	6,70%	4,7
ES_atlantic (Bay of Biscay)	10,00%	9,40%	0,6
SI_meditsea	9,80%	6,40%	3,4
BG_blacksea	9,70%	9,70%	0
ES_meditsea	9,20%	7,70%	1,5
PT_Madeira and Azores	7,48%	-	-
ES_atlantic (Gulf of Cádiz)	6,80%	6,60%	0,1
IT_meditsea	6,00%	5,30%	0,7
FR_meditsea	5,30%	4,40%	0,9
DE_baltsea	5,30%	4,60%	0,6
DE_northsea	4,80%	4,30%	0,5
FR_northsea	4,70%	3,20%	1,5
FR_atlantic	4,70%	3,50%	1,3
BE_northsea	4,60%	3,40%	1,2
LT_baltsea	4,10%	3,80%	0,3
SE_northsea	3,80%	3,50%	0,3
NL_northsea	3,80%	3,80%	0
SE_baltsea	3,60%	3,50%	0,2
FI_baltsea	3,60%	3,50%	0,1
IS_atlantic	3,24%	-	-
LV_baltsea	3,20%	3,00%	0,3
IS_bargreen	3,15%	-	-
DK_baltsea	3,10%	2,90%	0,2
DK_northsea	2,80%	2,80%	0,1
NO_Norwegian Sea	2,61%	-	-
NO_northsea	2,61%	-	-

Only countries with employment by place of work included: Estonia, Greece, Ireland, Portugal, Romania and UK excluded.

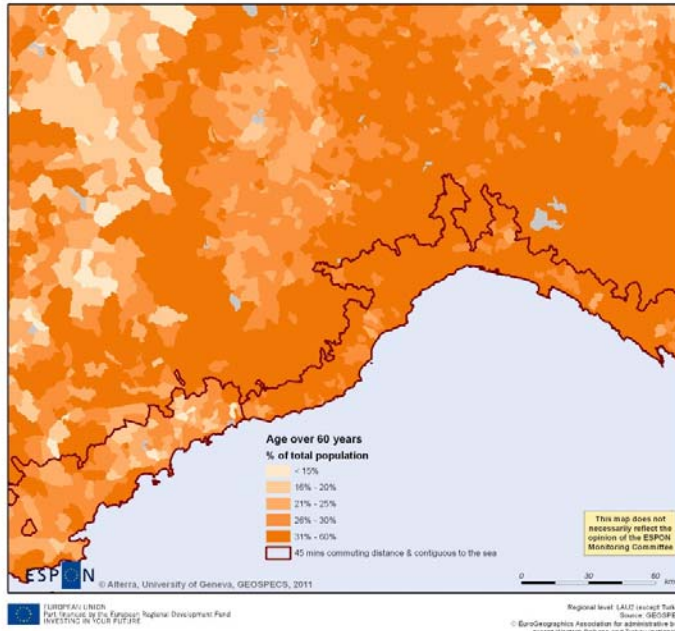
Coastal population and age

The highest percentage of people aged over 60 resides on the German coasts of the North and Baltic Seas (see Figure 21 - focused area North Sea Coast of Germany). Similar to the pattern of employment in the service industry for the Baltic Sea, the areas with the highest percentage are located directly on the coastline for similar reasons as tourists, such as the sea view, but also because a certain level of services and infrastructure ensures a certain standard of living. Coastal areas with high percentage of people aged over 60 (Map 43) have a similar pattern to coastal areas with a high percentage of employment in the service industry (Map 42). These areas also coincide with coastal areas with a relatively high percentage of overall population density. However, coastal areas favoured for retirement are not the coastal megacities but smaller coastal settlements, which can increase the urbanisation of an area.

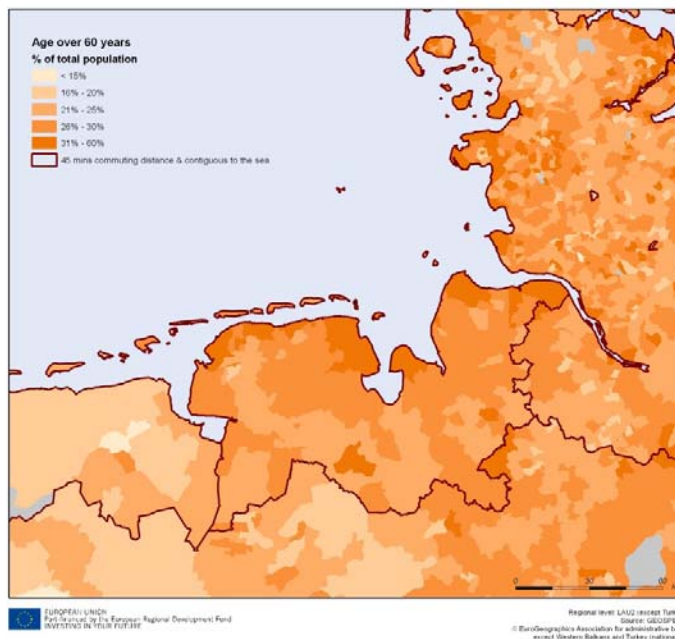
Factors such as good infrastructure and services attract retirees to certain locations to maintain their lifestyle; another important factor that attracts many retirees is climate. Map 43 shows the French Mediterranean coast, known for its warm sunny climate and the relatively large area with a high percentage of people over 60.

These numbers again have to be seen in context with the figures for the entire country as they may reflect just a countrywide pattern of an ageing population. Figure 21 shows that a number of countries do have a higher percentage of people aged 60 and over inhabiting their coastal areas compared to the entire country such as most of the German coasts, the French coasts, some Spanish Atlantic Coasts, UK coasts, the Italian Mediterranean coast and the Belgium coast among others. However, in a number of coastal areas the opposite patterns is evident e.g. especially in the Outermost Regions, along some Spanish Atlantic coast and the coastal areas of the Bulgarian Black Sea. Figure 21 again demonstrates that there is not just one pattern but a range that sometimes along the same regional sea shows contrasting values e.g. for the different Spanish Atlantic Coastal Regions.

French Mediterranean Sea Coast



German North Sea Coast



Map 43 Percentage of the population aged 60 in the North Sea Coastal areas of Germany and the French Mediterranean Coastal area.

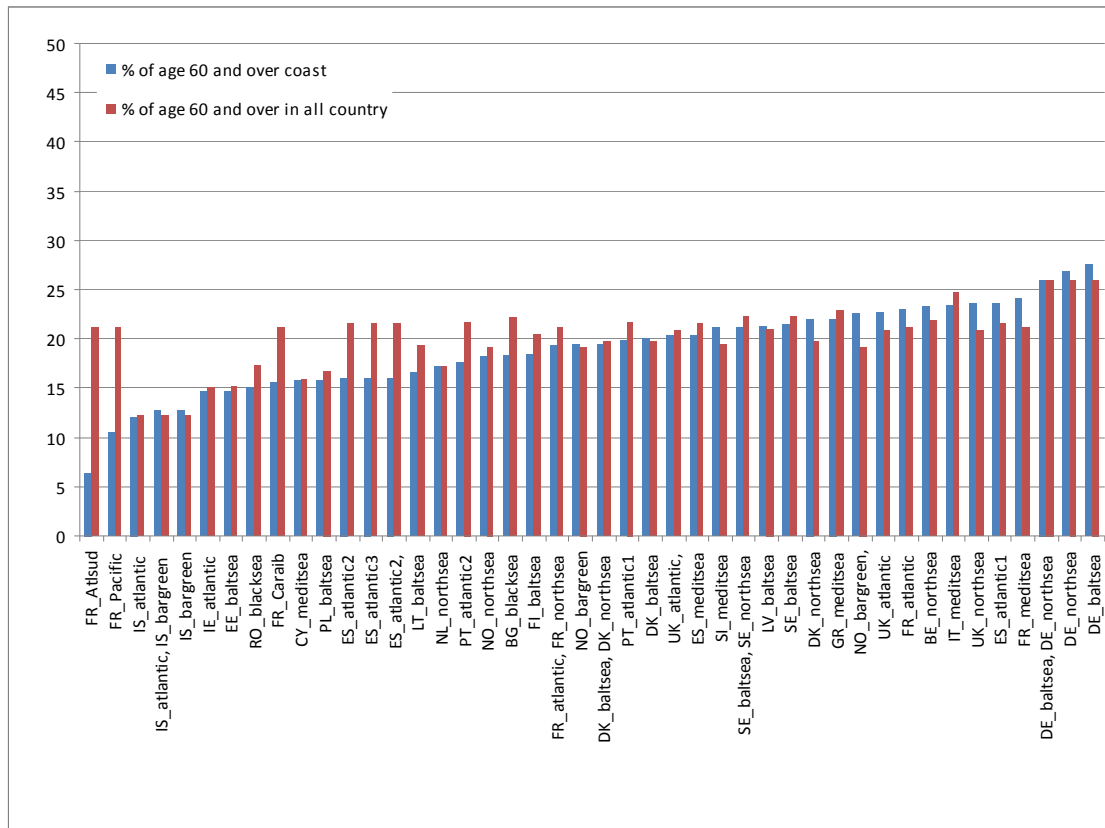


Figure 21 Percentage of population aged 60 and over in coastal LAUs (country and regional sea) and in the entire country.

Conclusion

Coastal socio-economic structures and trends are not uniform across Europe and the ESPON space, but display a range of developments, sometimes with significant contrasts. While, on average, population density is higher in the coastal areas than the inland parts of individual countries, high numbers of inhabitants are not equally distributed across the coastal regions of the ESPON space; there is a range from extreme densely populated to sparsely populated areas. The latter face similar overall challenges as their inland counterparts, while their coastal location may be an opportunity in terms of coastal tourism or an added challenge in terms of added isolation of the region. Issues related to urbanisation are not specifically coastal, e.g. urban sprawl in densely populated areas and spatial manifestation of inequality (DeVerteuil, 2009) or disruption of ecosystem connectivity due to infrastructure development and other associated activities (Pinoa and

Marullb, 2012). However, it is important to understand the influence of the coastal location on such developments: for example, the proximity of the sea in a region may have accelerated the urbanisation process or set such developments in motion as in-migration to the area increased either because people were attracted by employment in the coastal tourism industry or because they came to retire to the area because it is coastal.

In general, coastal areas are locations of a great variety of economic activities, especially around ports; however, in some coastal regions, certain sectors of employment e.g. coastal tourism and especially the associated service industry are predominant. These areas, similar to mountain regions, are over-dependent on that often seasonal sector and vulnerable to any changes in visitor numbers or spending behaviour of tourists, which can be caused by a variety of factors, including climate change or economic recession. Predominantly large employment numbers in the tourism and service industry can be found on coasts with a warm climate, which also attract higher numbers of senior citizens for retirement. In general, population ageing is due to longer life expectancy and decreasing birth rates (Gervais-Aguer, 2006; Bryden, 2000). However, Gervais-Aguer (2006), in a study of migration of British seniors to France, argues that the increase in population ageing due to the migration of older people can be significantly attenuated by a younger labour force remaining in the host region. Conversely, in-migration of elderly people to the coastal zone can address population imbalances (i.e., overpopulated urban areas versus sparsely populated rural coastal zones) and can be an opportunity (Bryden, 2000). On the other hand, there is a danger of increased urbanisation of rural coastal areas, which in turn can lead to the problems outlined above.

Challenges and opportunities in terms of the socio-economic development in coastal regions in Europe and the wider ESPON space may not be specifically coastal in their nature, but may be increased or initiated by their coastal locality. There is no single coastal pattern that applies across the ESPON space, but a range of coastal areas that are influenced by their proximity to the sea.

4.1.5 Border areas

This section presents the main findings resulting from a quantitative analysis of LAU 2-level data gathered by GEOSPECS for border areas. The quantitative analysis focuses mainly on the “core border areas”, for which we assume that the existence of a politically-defined border has a high influence on all kinds of socio-economic and socio-cultural exchange relations. These core border areas are generally consist of two sub-groups: (1) a large group of areas which are contiguous to a border and in which this borderline can be accessed within a maximum travel time of 45 minutes and (2) a very small group of areas which are still contiguous to a border but in which the time needed to reach this border exceeds the 45-minute threshold.¹⁰⁸

In addition, “adjacent border areas” were also included in some parts of this analysis (i.e. assessment of the urban potential, see below). They comprise places which are not contiguous to a border and in which the closest border can be accessed in a travel time between 45 and 90 minutes. For these areas, we assume that the existence of a politically-defined border has only a low influence on all kinds of socio-economic and socio-cultural exchange relationships.

Basic features of the “core border areas”

The core border areas in which a politically defined borderline can be reached within a 45-minute travel time (see: Annex 48) cover 661,000 km²: 14% of the total surface of the EU27 including Norway, Iceland, Switzerland and Liechtenstein.¹⁰⁹ Those border areas cover around half or even much more of the total national territory of 8 countries;¹¹⁰ in 13 other countries, the levels of coverage are well below the overall average of 14% (i.e. ranging from 0%-10%).¹¹¹ In total, 99,343,000 persons live in these border areas: 20% of the total population of the countries covered. In 9 countries, about half or even more of the total population live in border areas¹¹² while, in 17 other

¹⁰⁸ This is often due to a poorly developed road network which in principle allows accessing a given border, but not within a 45 minutes travel time.

¹⁰⁹ No data was available for Albania, Croatia, Kosovo, Montenegro, Serbia and Turkey.

¹¹⁰ Luxembourg and Liechtenstein (100%), Belgium (92%), Slovenia (72%), Slovakia (61%), the Netherlands (60%), the Czech Republic (52%) and Switzerland (49%).

¹¹¹ Cyprus, Iceland & Malta (0%), Norway (1%), Sweden & United Kingdom (3%), Spain (4%), Finland & Italy (5%), France (7%), Denmark (8%), Bulgaria (9%) and Ireland (10%).

¹¹² Luxembourg & Liechtenstein (100%), Belgium (84%), Switzerland (75%), Slovenia (68%), Slovakia & Austria (66%), the Netherlands (51%) and the Czech Republic (49%)

countries, the proportions are clearly below the overall average of 20% (i.e. from 0%-17%).¹¹³ When adding to these border areas the contiguous border areas (see: Annex 49), the following changes can be observed: while the overall proportion of the area covered by the now enlarged set of border areas increases significantly (i.e. from 14% to 22%), the overall share of the population living in all these areas remains largely unchanged (i.e. from 20% to 19.9%).

At the level of individual countries, however, this inclusion of border areas produces some noteworthy effects, especially in case of the two country groups. First, a change occurs in the group of countries in which territorial coverage by border areas is well below the overall average. Norway, Sweden and Finland drop out of this group because the inclusion of contiguous areas leads to a strong increase of the overall proportion of the national area covered by border areas. Second, in the group of countries with the lowest shares of border population in their total population, although the overall country-composition remains unchanged, in some cases there is a slight or even substantial increase of the share of the border population covered.¹¹⁴

Basic land-cover patterns & degrees of “naturalness”

A mapping of the predominant land-cover patterns on the territory of core border areas in the EU27/EEA and Switzerland (see: Map 44) gives an overall impression about their basic landscape characteristics and also allows general assumptions to be made regarding their potential degree of “naturalness” (see Annex 50).

A smaller but still important group of core border areas has an particularly strong presence of man-made land covers (i.e. mainly built environment, but also very high proportions of fields and pastures), as the land cover category “artificial surfaces in combination with agriculture” is clearly over-represented. These areas are located at land borders, most often in the West and North of the EU, but sometimes also in the Central-Eastern part of the EU. This land cover category is either similar on both sides of a border¹¹⁵ or

¹¹³ Cyprus, Iceland & Malta (0%), Sweden & United Kingdom (1%), Norway (2%), Denmark (4%), Spain, Greece & Finland (5%), Portugal (6%), Ireland (9%), Bulgaria (10%), Italy (11%), France (15%), Estonia & Poland (17%).

¹¹⁴ Norway (from 2% to 6%), Sweden (from 1% to 3%), Finland (from 5% to 7%) and Bulgaria (from 10% to 13%).

¹¹⁵ i.e. IR-UK, FR-BE, BE-NL, DE-DE-NL, DE-NL, DE-DK, DK-SE, HU-RO, RO-BG.




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Regional level: LAU2 (except Turkey LAU1)
Source: GEOSPECS, 2011
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except Western Balkans and Turkey (national sources)

Ascendant classification of land cover patterns in LAU2 within 45 minutes from borders

Main overrepresented types of land cover

- | | |
|---|--|
|  Forests strongly overrepresented (French Guiana) |  Lakes |
|  Forests |  Cyprus - Acquis suspended |
|  Wetlands and water areas |  Non-ESPON space |
|  Unvegetated areas and glaciers |  No data |
|  Scrubland and no vegetation |  ESPON Space |
|  Agriculture | |
|  Artificial surfaces in combination with agriculture | |

Map 44 Predominant land cover pattern in core border areas

Other interesting and complementary aspects can be highlighted by mapping individually some of the main land-cover categories (see: Annex 51).

only present on one side¹¹⁶. The naturalness of these border areas tends to be low, very low, or even absent (i.e. mainly in cities and urban agglomerations), because all sorts of human interventions are very intense (or extreme), which has led to a significant alteration (or complete loss) of biotic elements and also to an intense/very intense (or extreme and complete) fragmentation of natural habitats. As a consequence, their territory consists mainly of "highly intervened systems" and "semi-transformed systems" and, in the densely populated urban areas, even of "transformed systems" and completely "artificial systems".

A first one concerns the entire Norwegian borderland in the neighbourhood of Sweden, Finland and Russia which is not completely unvegetated or covered by glaciers, but has quite high levels of forest coverage in some sub-areas.

Another aspect concerns the cover of artificial surfaces: along some borders characterised by a predominance of scrubland/no vegetation/glaciers or of forests and agriculture, high proportions of artificial surfaces co-exist either punctually¹¹⁷ or in more generally (e.g. the Upper Rhine Area along the trilateral border DE-FR-CH; along the FR-DE border between Saarland and Lorraine).

A final and relatively similar aspect relates to the cover of agricultural land: along some borders with a predominance of another land-cover category, there is also a punctually high significance of agricultural activities (esp. ES-PT; GR-Macedonia; GR-BG-TR)¹¹⁸.

¹¹⁶ i.e. parts of the northern French border with BE and LU; parts of the north-eastern Austrian borders with CZ, SK & HU; larger parts of the northern Swiss border with FR, DE & AT; the entire Romanian border with Moldova

¹¹⁷ e.g. along the FR-ES border at the two coastal extremities of the Pyrenees especially on the French side; along the FR-IT border at the coastal part of the Alps especially on the French side; along the IT-CH border especially in a larger area on the Italian side stretching from Como to Milan; along the FR-BE-LU border, especially in the south-west of Luxembourg; along the CZ-PL border in a larger area covering parts of the Moravian-Silesian region (CZ) and of the Silesian Voivodeship (PL).

¹¹⁸ e.g. in the central-south border areas of Extremadura (ES) region and the border areas of the neighbouring districts Portalegre & Évora (PT); in Greece at the border with the Former Yugoslav Republic of Macedonia (i.e. region Central Macedonia, municipalities of Paionia and partly of Kilkis) and at the trilateral border with Bulgaria & Turkey (i.e. region East Macedonia & Trace, municipalities of Didymoteicho and Orestiada).

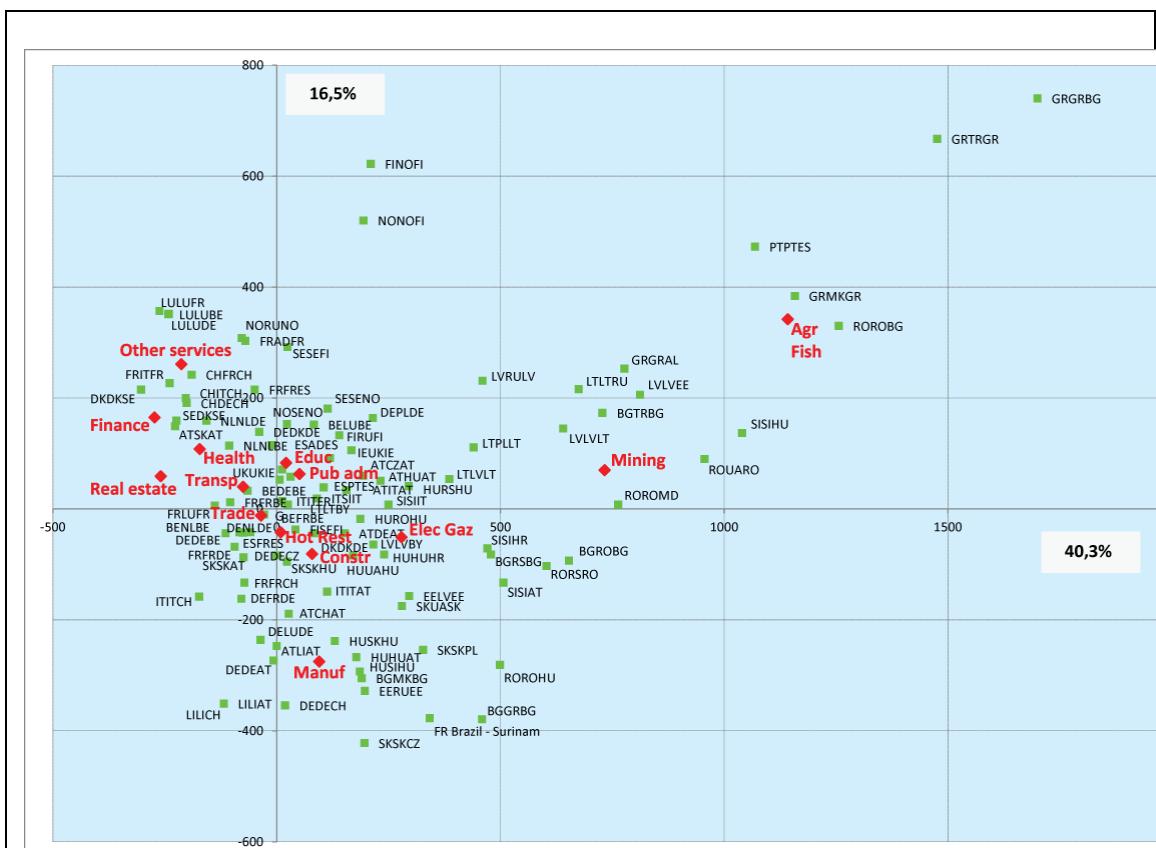
Basic economic activities

The result of a factor analysis which was carried out on the sector-specific employment structure of all core border areas (Figure 22) reveals a number of interesting geographical patterns for their basic economic activity:

- In the central-left part of the matrix is a very dense cluster comprising many border areas with a relatively diversified economic structure. Here, the active population is primarily employed in a variety of categories belonging to the tertiary sector¹¹⁹ and also some categories belonging to the secondary sector (e.g. construction, electricity and gas, manufacturing). These border areas are most often located in the "old" EU15 Member States.
- Above this dense cluster is a smaller group of border areas where employment is concentrated more on some specific elements of the tertiary sector such as "financial intermediary services" and the diverse segment of "other services". This appears to be the case for the border areas of Luxembourg (e.g. importance of financial services and services of extra-territorial organisations) and also for several of the northernmost border areas in Norway, Finland and Sweden (e.g. importance of community, social and personal services, and household activities).
- Below this dense cluster is a larger group of border areas where employment is mostly concentrated in the main categories of the secondary sector (i.e. construction, electricity and gas, manufacturing). This group consists of border areas which are located both in some of the "old" EU15 Member States (e.g. Germany, Austria, Italy, France) and in several of the new Member States (e.g. Slovakia, Estonia, Hungary, Bulgaria, Romania).
- In the middle and right part of the matrix is a larger group of border areas where employment is mostly concentrated in "mining & quarrying" as well as "agriculture, fishing, livestock, hunting & forestry". These border areas are most often located in the new Member States (e.g. Bulgaria, Romania, Slovenia, Latvia, Lithuania Hungary), but also in some of the more peripheral "old" EU15 Member States (e.g. Portugal, Greece).

¹¹⁹ e.g. wholesale & retail trade, hotels & restaurants, transport & communications, financial intermediation, real estate, public administration/defence & compulsory social insurance, education, health & social work, other community, social & personal service activities

If one looks within the matrix at the distance between two border areas belonging to the same border (see: Annex 52), some general geographical patterns can be observed for potential cross-border differences in the employment structure. Although such differences between the sectoral employment structure of border areas exist along all EU27/EEA borders, they are the most significant along six of these borders (i.e. GR-BG, PT-ES, SI-HU,



Factor analysis based on the number of employees by branch (“NACE-category”) in areas within 45 minutes from a national border line.

Note: For an identification of individual border areas, the “6-letter code” has to be read as follows: The first two letters indicate the individual national segment along a border (i.e. the larger domestic border area), whereas the last four letters indicate the specific border considered. Example: “BGGRBG” = Bulgarian part of the Greek-Bulgarian border.

Figure 22 Factor analysis of the sector-specific employment in border areas

RO-BG, LV-EE, SL-AT) and smallest along another 11 borders which most often separate “old” EU15 Member States from each other or from Switzerland and Norway (i.e. FR-DE, FR-BE, DK-SE, DE-BE, NL-BE, IT-AT, CH-AT, NL-DE, NO-FI, FR-ES, SK-HU).

Urban potentials¹²⁰

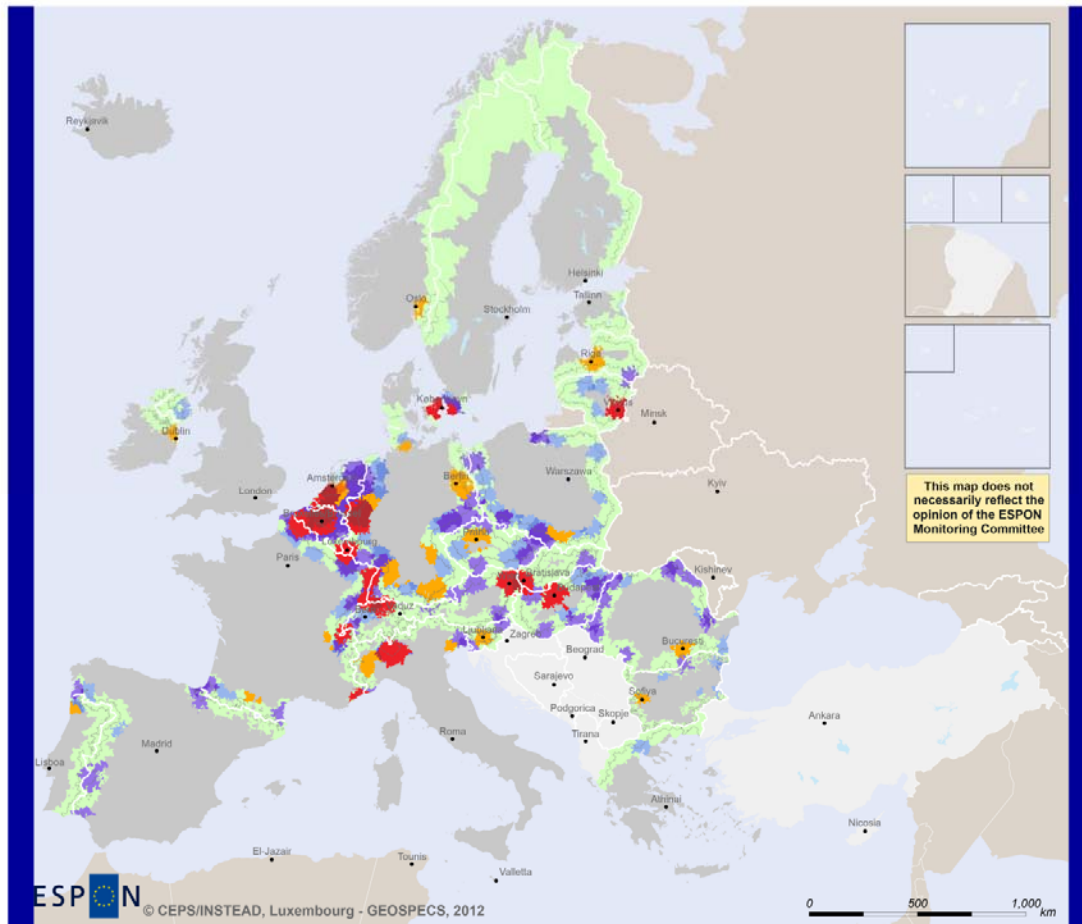
The urban potential, understood as the influence an urban centre is likely to exert over a given area, was assessed in relation to the notion of PUSH (Potential Urban Strategic Horizons) for “core border areas” and “adjacent border areas”. From this basis, the LAU2 municipalities within these two categories were classified according to a descending hierarchical method (see: Annex 53). A mapping of the urban potential of functional border areas across Europe illustrates the following geographical patterns (Map 45).

(1) In terms of location, the majority of core border areas with metropolitan potential (in red on the map) are found in North-Western Europe, notably along the borders between the Benelux, France, Germany and Switzerland. They are polarised by cities located close to a border (most are even cross-border agglomerations), which is notably the case for Lille, Luxembourg, Strasbourg, Basel, Geneva or Copenhagen. Here, cross-border functional as well as an institutional integration exists¹²¹. There are also some metropolitan centres located at a distance from the border, although still within a core border area, which do not have any significant cross-border potential (e.g. Brussels, Cologne, Düsseldorf, Milano, Vienna or Budapest).

(2) Adjacent border areas with metropolitan potential (in orange) are particularly well represented in Germany (i.e. metropolitan centres like Berlin, Munich, Hamburg); the other cases are scattered across the continent. These urban poles located within an adjacent border region can exert a metropolitan influence on core border areas, but such metropolitan spill-over effects not primarily linked to the border tend to take place mostly in the borderlands east of Berlin or in South Bavaria (Munich).

¹²⁰ This section presents the main findings of an “internal working paper” elaborated for the GEOSPECS border group: Sohn, C. / Stambolic, N. (2012): *Typology of border regions according to their urban potential*. CEPS/INSTEAD, February 2012.

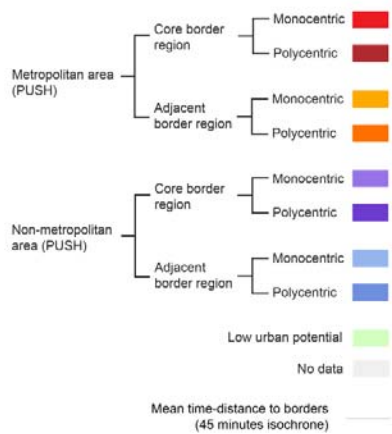
¹²¹ ESPON (2010): *Metroborder. Cross-Border Polycentric Metropolitan Regions*. Final Report. Luxembourg, ESPON, 2010. Sohn, C. / Reitel, B. / Walther, O. (2009): *Cross-Border Metropolitan Integration in Europe: The Case of Luxembourg, Basel and Geneva*. In: *Environment & Planning C: Government and Policy* 27: pp. 922–939.




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 Source of data: Alterra, University of Geneva, GEOSPECS, 2012
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 except Western Balkans and Turkey (national sources)

Urban potential typology



Map 45 Typology of functional urban areas in border areas

Border areas with urban potential that is not metropolitan (in purple and blue) are distributed all over Europe, but with a higher concentration in the borderlands of the Benelux, France, Germany, Poland, Czech Republic, Hungary and Romania.

(4) Finally, the border areas which show a low urban potential (in green) are particularly located in Scandinavia, the Baltic countries, the eastern part of Poland, and mountainous regions such as the Alps and the Pyrenees.

In order to complete the characterisation of the urban potentials of European border areas, two demographic variables (the resident population and population change) were analysed.¹²² This allows a better assessment of the importance of the urban potential of border areas at a European scale and also unveils interesting overall patterns as well as national specificities.

The resident population of all European core border areas located less than 45 minutes of travel distance from a borderline is 102 million in 2006 (see: Annex 54). Among these, 45% (45.7 million) are in a border region with metropolitan potential and 35% (36.2 million) in a border region with non-metropolitan urban potential. In total, almost 80% of the population living in border areas can thus be considered as urban. If one further extends the level of coverage also to municipalities located not more than 90 minutes away from a border (i.e. "adjacent border areas"), this logically increases the population covered (to 209 million) but does not significantly change the distribution among the three main categories considered.

The analysis of the population distribution by country reveals sharp contrasts. In absolute terms, Germany, followed by Belgium, France, Italy, Switzerland and the Netherlands, are the countries with the highest numbers of people living in border areas with metropolitan potential (almost 80%). In contrast, the Baltic countries and East European countries such as Poland, Czech Republic, Bulgaria and Romania have a very low population potential for this category of border areas. There is less of a contrast in the distribution of population in non-metropolitan urban border areas, with East European countries such as Poland, Czech Republic and Romania showing rather high values. Surprisingly, the country with the highest number of inhabitants in border areas with low urban potential is Germany (3.6 million).

¹²² In order to simplify the analysis, the 8 categories presented in the typology were aggregated into 3: metropolitan potential, non metropolitan urban potential and low urban potential.

Population change reflects the socio-demographic dynamics of border areas and also, to some extent, their attractiveness. More specifically, a positive growth rate tends to demonstrate the existence of a metropolisation/urbanisation process (strong potential) whereas a negative rate reflects a process of urban decline (low potential) or rural exodus. Our analysis of population change was based on population statistics collected at LAU2 level for 2001 and 2006 (see: Annex 55)¹²³ and shows that there is a clear trend towards an increase of population within the border areas that have a metropolitan potential. At the European level, this represents more than one million inhabitants in a period of 5 years (+2.4%). In contrast, the population of border areas with an urban potential that is not metropolitan appear to be rather stable (+0.3%), and the population of rural border areas declined (-0.6%). In total, European core border areas experienced an increase of population of 1.1% between 2001 and 2006.

When considering the data on population change at the country level, one can establish a clear distinction between two groups of countries as far as major trends are concerned. One group is the East European countries, most of them having joined the EU recently, which show on average a population decline in their border areas (-1.4%). This is basically also the case on a state level, except for Slovenia, where the population grew. On the other hand, the older EU Member States (plus Norway and Switzerland) experienced a positive population growth both on average (+2.1%) and on an individual basis (except Finland and Greece). The contrast between the two groups of countries is confirmed once the different categories of urban potential are taken into consideration. In Western Europe, border areas with urban and metropolitan potentials experienced a clear increase of population, whereas within East European countries the border areas with metropolitan potential are almost stable and the two other categories are declining.

Conclusion

An important conclusion which can be derived from our analysis of basic land-cover features and degrees of naturalness as well as of patterns for economic activity and urban potential is that, by and large, two different main groups of core border areas exist in the EU:

¹²³ Due to some inconsistencies in the dates of reference and in the definition of territorial units, the results should be considered as orders of magnitude of the changes rather than as precise values. The lack of reliable data in 2001 for Lithuania, Portugal and the United Kingdom has resulted in the exclusion of these countries from the calculation of demographic change.

- The first group covers a larger number of border areas which are most often located along borders in the central area of the former EU15. They have frequently a diversified economic structure or are more specialised on particular value-added elements of the secondary and tertiary sector (e.g. manufacturing, financial services), but they all show degrees of naturalness which are mostly medium and low or even very low. This group also hosts most of EU's core border areas with metropolitan potential, but also many core border areas with a non-metropolitan potential.
- The second group comprises border areas with a generally less diversified economic activity structure (i.e. strong focus on specific elements of the primary, secondary or tertiary sector), but also with degrees of naturalness that are most often medium and sometimes also high/very high. Several of these areas are located at the more peripheral borders of the former EU15 (e.g. ES-PT, borders of Greece, northernmost Scandinavian borders), but more frequently they can be found along the internal or external borders of the new EU Member States. This group hosts mostly core border areas with a non-metropolitan urban potential or with a low urban potential, although some exceptions can be observed (i.e. in Hungary, Slovakia, Lithuania).

Two more specific conclusions, also having important theoretical implications, can be derived from our identification of urban potentials and from the analysis of associated demographic trends:

- First, it appears clearly that a border context is not incompatible with the development of competitive urban centres, as suggested by the classic and neoclassic location theories.¹²⁴ The strong population growth experienced in metropolitan core border areas might even illustrate some kind of social and economic attractiveness within these specific areas. Although these conclusions will later be further corroborated by our case studies on the "cross-border metropolitan regions" of Geneva and Luxembourg (see: section 5.2.5), it is now indeed the first time that they can also be evidenced by the findings of a large-scale empirical analysis.

¹²⁴ For a comprehensive overview see: Hansen, N. (1981): *The Border Economy*. Austin: University of Texas Press, 1981.

- Second, the strong contrast between West European countries and East and Central European countries highlights the determining role of open borders in the urbanisation of border areas. Whereas among "old" EU Member States, borders have undergone significant changes since the 1980s, resulting in an affirmation of their interface function to the detriment of their barrier and control role, this trend is much more recent among the new EU Member States. The rise of metropolitan as well as of urban potentials of border areas is thus triggered by the opening of borders and the new opportunities that arise for their economic, cultural or political development.

4.1.6 Outermost Regions

Population and socioeconomic patterns

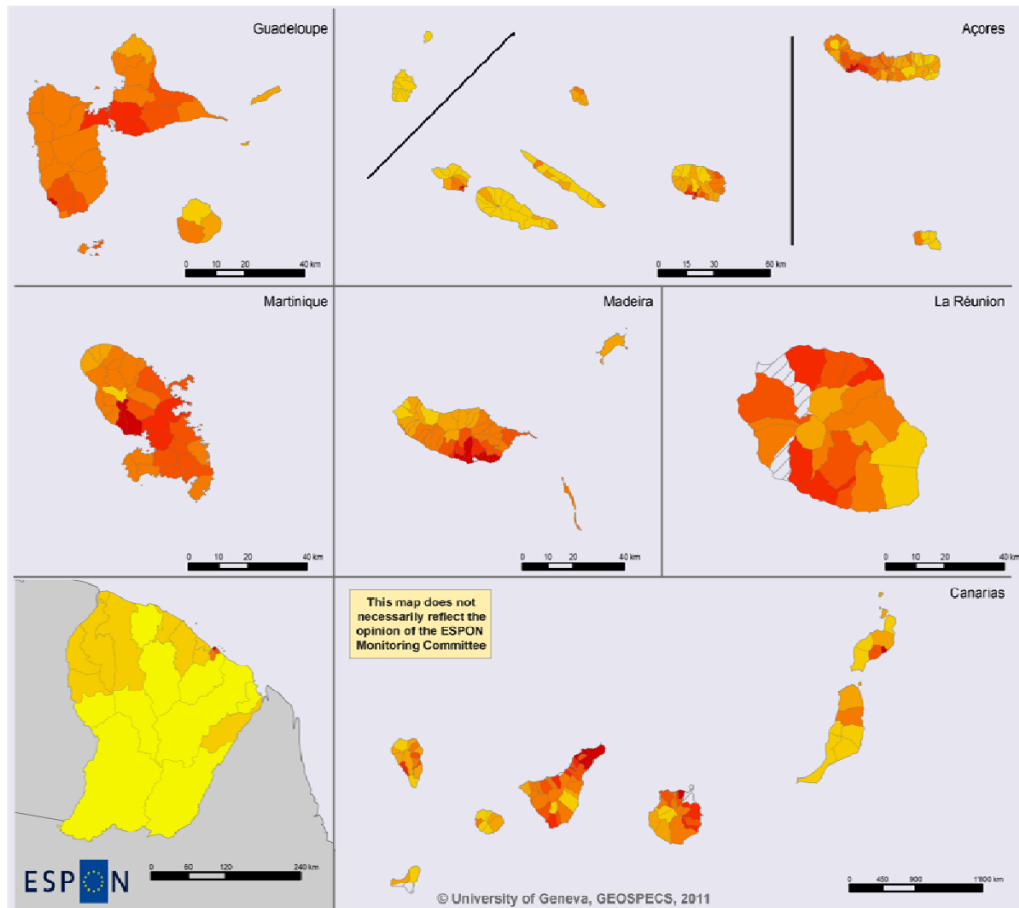
There are significant contrasts in the population densities of the Outermost Regions (ORs): both among ORs and in most cases, also within each OR (Map 46). In Martinique and Guadeloupe, population density is relatively high throughout the islands, highest in the capitals (Fort-de-France in Martinique, Pointe-à-Pitre and Basse-Terre, where administrations are located, in Guadeloupe).

French Guyana, in contrast, is very sparsely populated, with the great majority of inhabitants concentrated in a few areas: Cayenne and the Kourou area (the Space centre attracts technicians and other workers) on the Atlantic coast; Saint-Laurent-du-Maroni in the west (on the Maroni river, Surinamese border); and Saint-George de l'Oyapock in the east (on the Oyapock, Brazilian border). The administrative areas (LAU2) are exceptionally large in French Guyana: for example, although the population is concentrated in the city of Saint-Laurent, a very large area (statistically attached to Saint Laurent) appears as more densely populated than more southern territories, although they are covered with rainforest and almost empty. In fact, almost the entire territory of French Guyana should be coloured in very light yellow, with only darker spots on the areas mentioned above.

The population of La Réunion is concentrated on the coasts (relief is very sharp, already a few kilometres inland), except for the south-eastern area, corresponding to the main lava flow area. Again, administrative divisions have an impact on statistics and mapping: most communes consist of a littoral string and a mountainous area, so that the coastal population density 'overflows' to the sparsely mountainous areas.

The Canarian and Azorean archipelagos are characterised by strong contrasts between densely populated capital islands (Gran Canaria and Fuerteventura in the Canary Islands, Saõ Miguel and Terceira in the Azores) and the other sparsely populated islands. The urban areas appear clearly since they concentrate a large proportion of these regions' populations. This is also true for Madeira, where the contrast is strong between the Funchal area and the north-western cape.

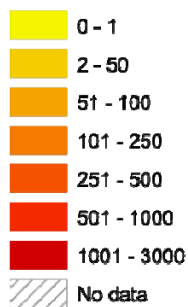
Population density, 2006



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Regional level: LAU2
Sources: © EuroBoundaryMap 2009
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Inhabitants per km²



Map 46 Population densities of the Outermost Regions

a) Age structure

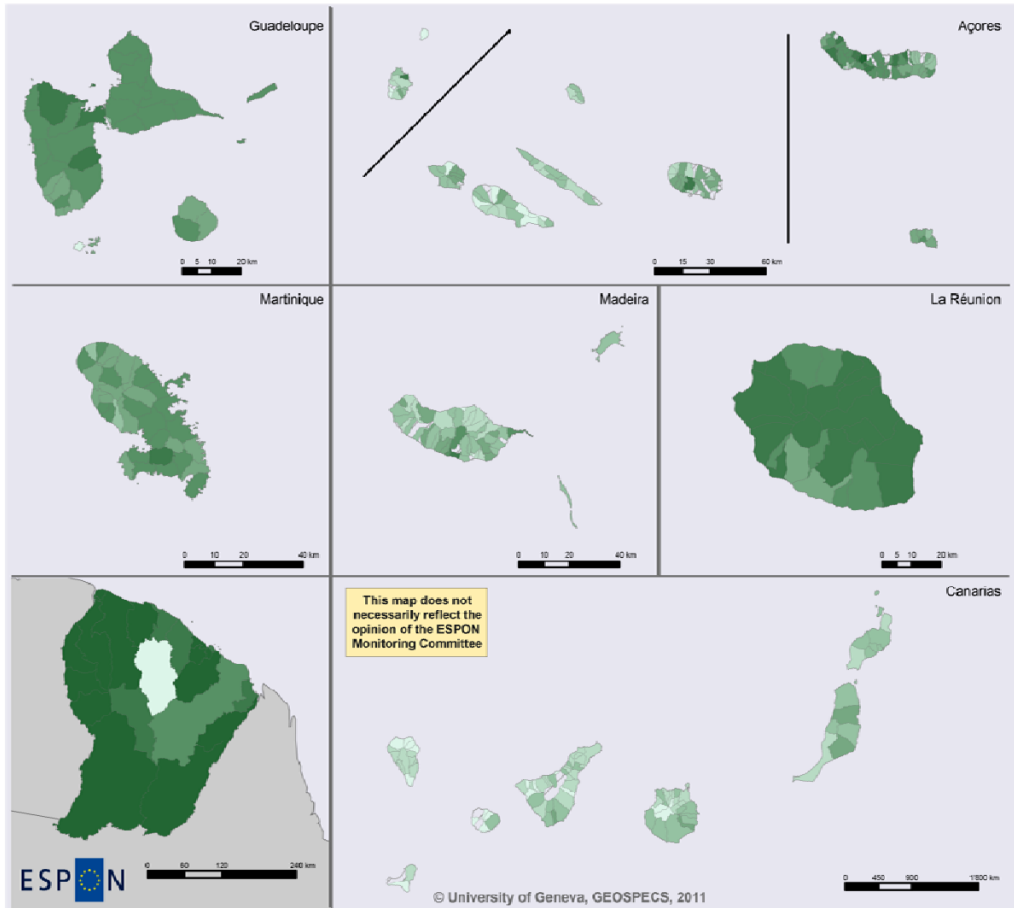
The dynamics of demography are generally positive in the ORs. With the exception of the Canary Islands, OR birth rates are higher than birth rates in their respective homelands. Demography is generally more dynamic in the French ORs than the Spanish and Portuguese ones, and particularly strong in French Guyana, with a birth rate of 27.7 ‰ in 2008 (France: 12.9 ‰). The proportion of the population of French Guyana below 15 years old is very high: 35-49% in most Communes, mainly along the borders with Brazil and Suriname. The latter administrative entities are not the most populated in absolute numbers, but host many immigrant populations among whom average birth rates are particularly high (among other reasons, because many Surinamese and Brazilian women come to French Guyana to give birth in good technical and social conditions).

In La Réunion, the proportion of population below 15 years old in most communes varies from 27% to 34%, and the birth rate in 2008 was 18.8 ‰. Demography is also dynamic in the French Antilles (Guadeloupe and Martinique), although to a lesser extent. Birth rates are close to the French average: 14.3 ‰ in Guadeloupe and 13.4 ‰ in Martinique, compared to 12.9‰ for France. The proportion of children and teenagers in Guadeloupe is slightly higher than in Martinique. In both Guadeloupe and Martinique, young people are concentrated in urban areas: Pointe-à-Pitre, Petit-Bourg and Sainte-Rose in Guadeloupe, Fort-de-France mainly in Martinique.

The Canary Islands have the oldest population of the ORs, especially in rural, isolated areas and on the smallest, Western islands of La Palma, La Gomera and El Hierro (less than 20%). In Fuerteventura and Lanzarote, a higher proportion of young people (20-30%) is found in major urban areas, such as Puerto del Rosario, Arecife. The Canarian birth rate is 9.9‰, lower than the Spanish average and, by far, the lowest of all ORs. The fact that many retired or near-retired Europeans have immigrated to the Canary Islands in recent decades has contributed to lowering the average age (notably on the two main islands of Tenerife and Gran Canaria). However, immigration for work is also dynamic, and has attracted many young people who came to work in the archipelago. Hence the relatively high proportion of young people in urban centres.

In the Azores, young people are clearly concentrated in the urban areas of the main island of Saõ Miguel, as well as of Terceira (although to a lesser extent). The birth rate in the archipelago is 11.4‰, i.e. higher than in the Canary Islands, but immigration is less dynamic.

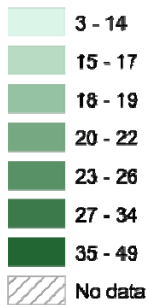
Population below 15 years old, 2001



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Regional level: LAL12
Source: © GEOSPECS 2011
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Percentage



Map 47 Percentage of population below 15 in the Outermost Regions

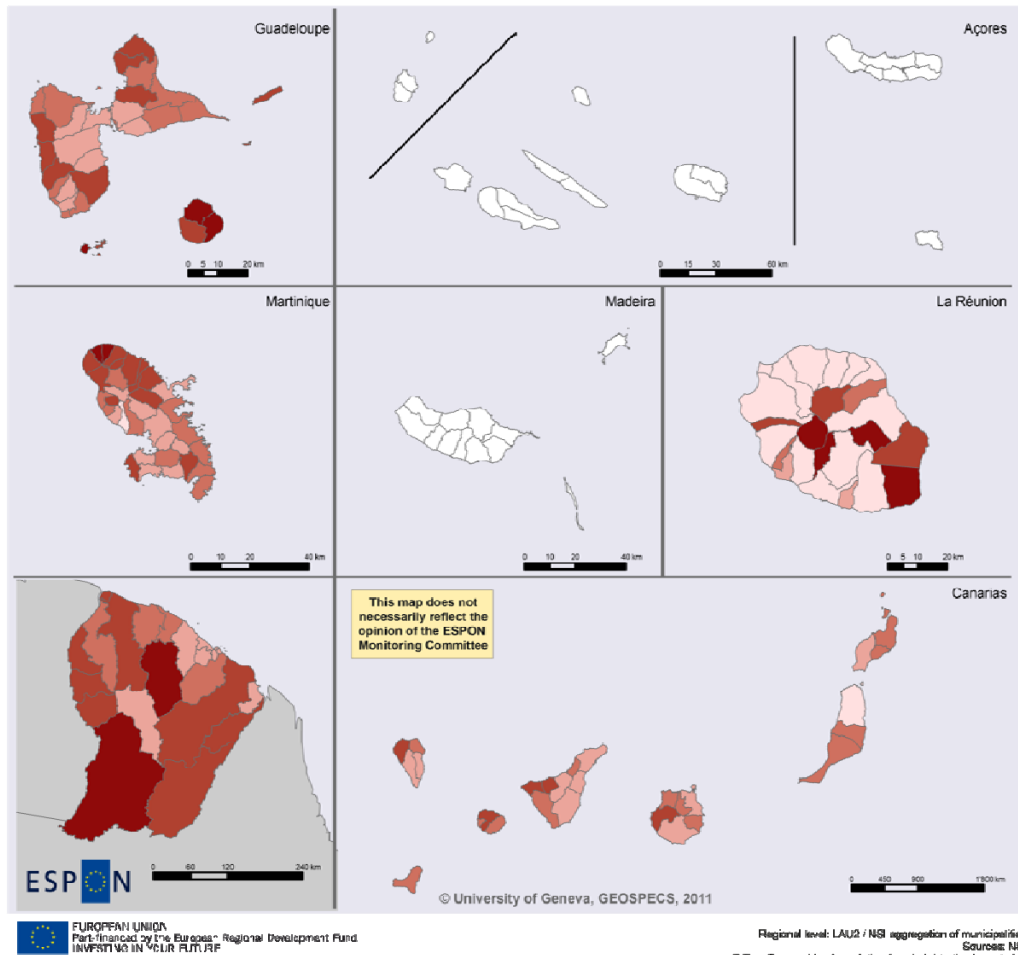
b) Levels of education and available revenues

The population of the French DOMs is the youngest, and quite often has low qualifications, especially in remote, rural areas such as southern French Guyana, the island of Marie-Galante in Guadeloupe, and the volcanic areas of La Réunion. However, the situation is contrasted: whereas the proportion of population with no qualifications is above 50% in a small number of areas of La Réunion, in most communes this proportion is less than 16%. In all communes of French Guyana and Guadeloupe, and almost all of Martinique, this proportion is above 16% (Map 48).

People holding higher education diplomas mainly live in urban areas, where the proportion of households with high available revenues is also high (Map 49). The correlation appears clearly in Tenerife (Canary Islands), for example: on the western part of the island, the proportion of unqualified people is very high, and revenues are lower than on the eastern part, where the proportion of qualified people is much higher.

It appears that available revenues are proportionally higher in the Canary Islands, and spatially more distributed, than in the French DOMs. In La Réunion, Guadeloupe and Martinique, as well as in French Guyana, higher revenues are concentrated in the main cities (Saint Denis, Pointe-à-Pitre, Fort-de-France and Cayenne), as well as in specific residential areas: smart residential suburbs of Fort-de-France (Schoelcher, Case-Pilote) and Le Diamant in Martinique, south of Basse-Terre in Guadeloupe (where local administrations and hence well-paid civil servants are located).

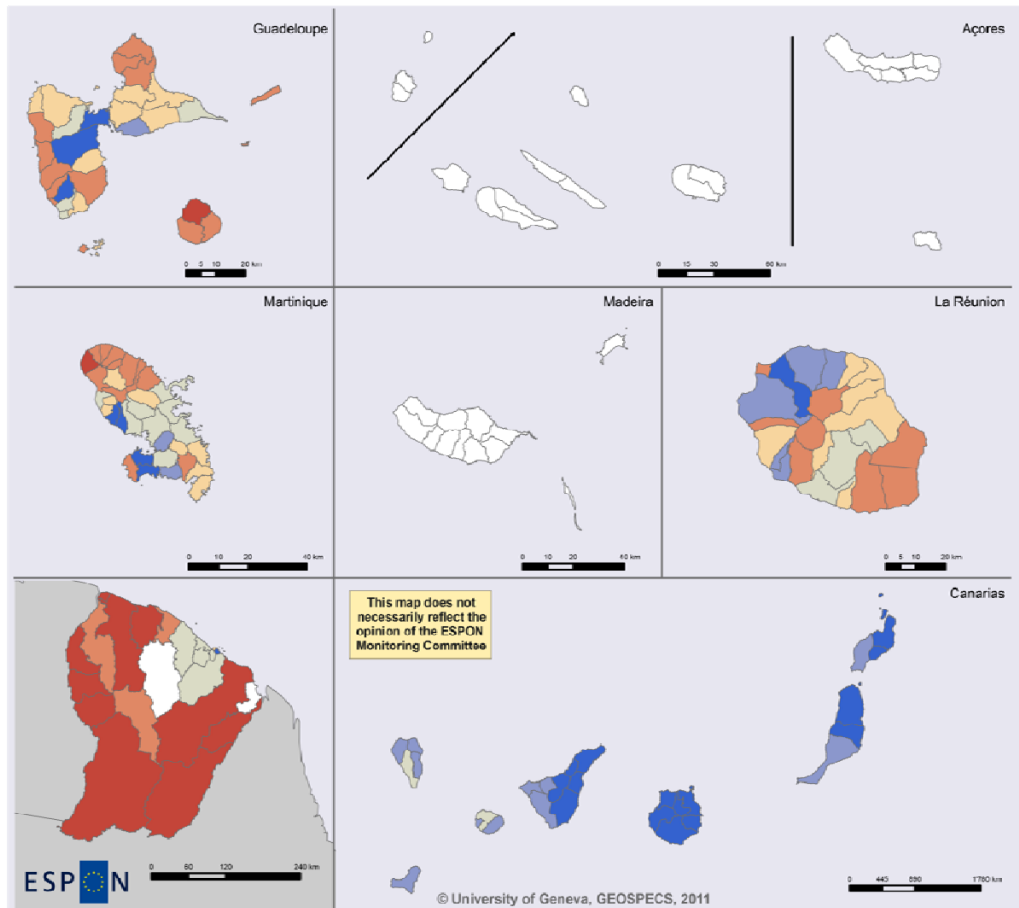
Population without diploma to the total population 2007-2008



Map 48 Outermost Regions: people without a diploma as a proportion of the total population

Average monthly available income per household

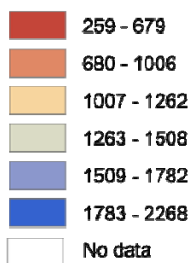
ES: 2009; FR: 2008




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Regional level: LAU2 / NSI aggregation of municipalities
 Source: NSI
 © EuroGeographics Association for administrative boundaries

Income per Household in Euro



Map 49 Outmost Regions: income per household

c) Structure of employment

The economies of the ORs are characterised by the strong (if not predominant) role of services. However ORs do not compose one homogenous group in terms of economic structuring, but rather three: the French, the Spanish and the Portuguese ORs (Map 50, Map 51, Map 52). Employment in the French DOM is very strongly reliant on public services: public administration, education and health. Manufacturing and financial activities follow. As opposed to what one could assume, tourism does not appear as a key employment sector. French Guyana shares these characteristics with the three other DOMs, although gold mining makes its economic profile a little more specific.

In the Canary Islands, jobs are concentrated in the hotels and restaurants sector on the two islands of Lanzarote and Fuerteventura, whose main activity is linked with tourism, while activity is more diversified in the two capital islands of Tenerife and Gran Canaria, being oriented towards the private sector, with tourism as a major contributor, but also including transportation, trade, construction, and real estate.

The Portuguese ORs, and especially the Azores, seem to follow a more rural pattern, being more dependent on agricultural and fishing activities than any other OR. In addition, the Azores are the OR with the lowest proportion of protected areas, which is of course related.

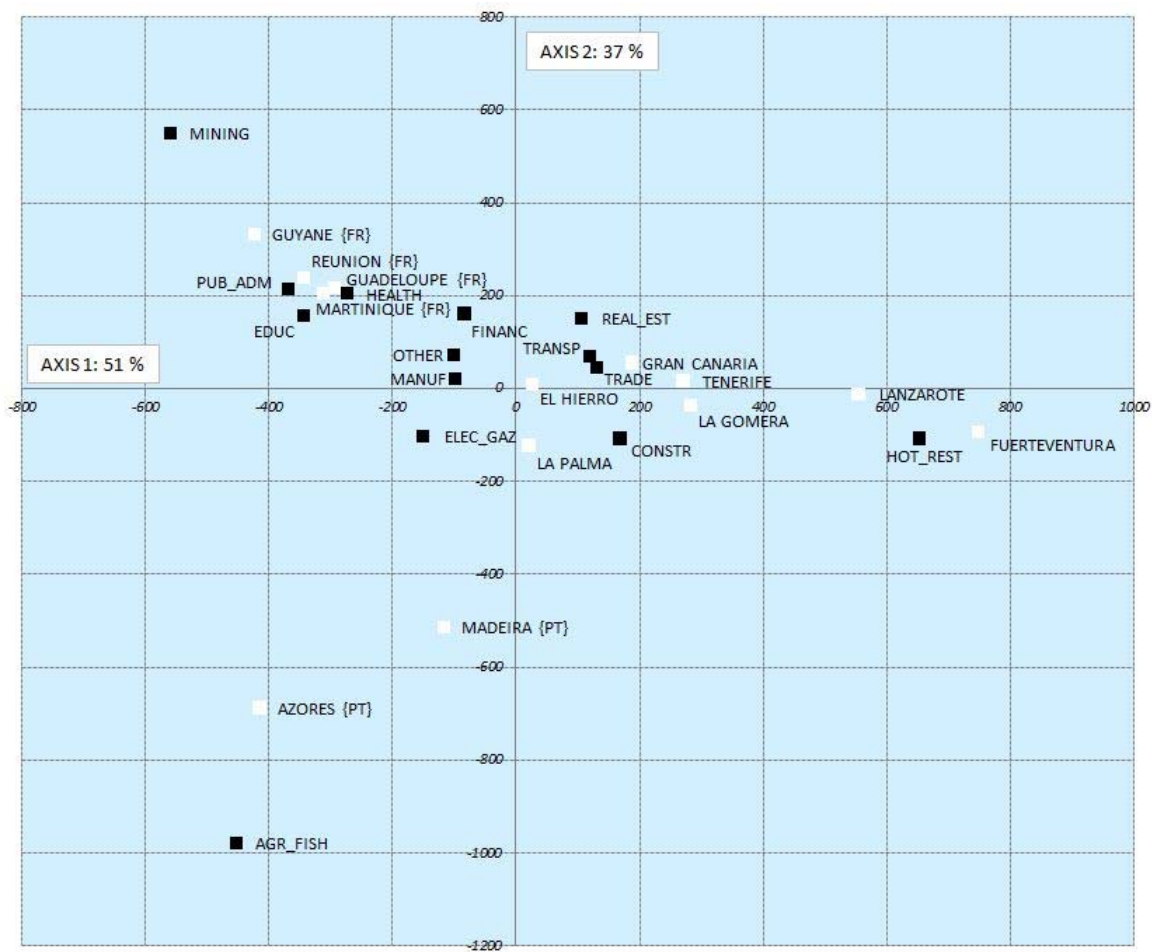
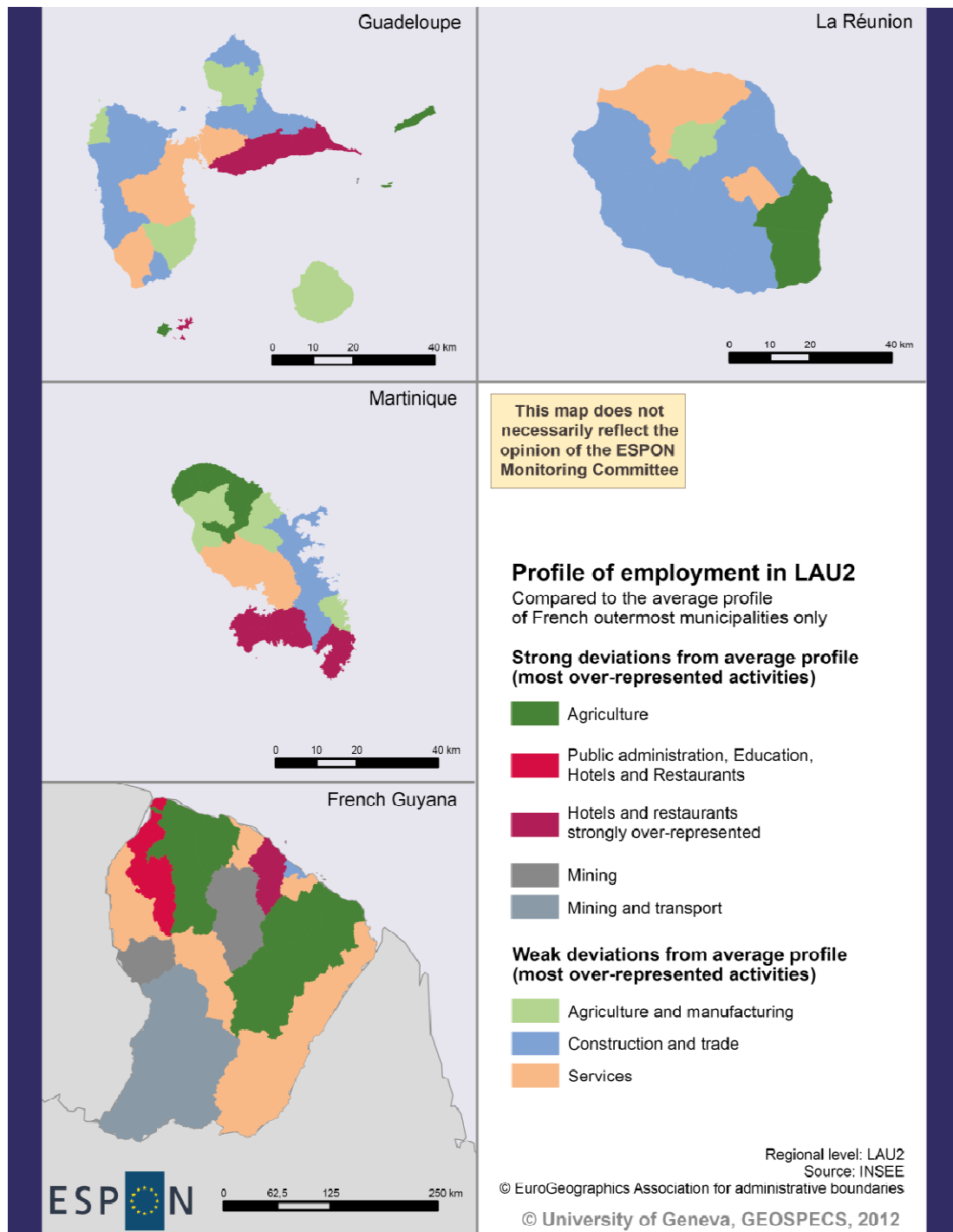
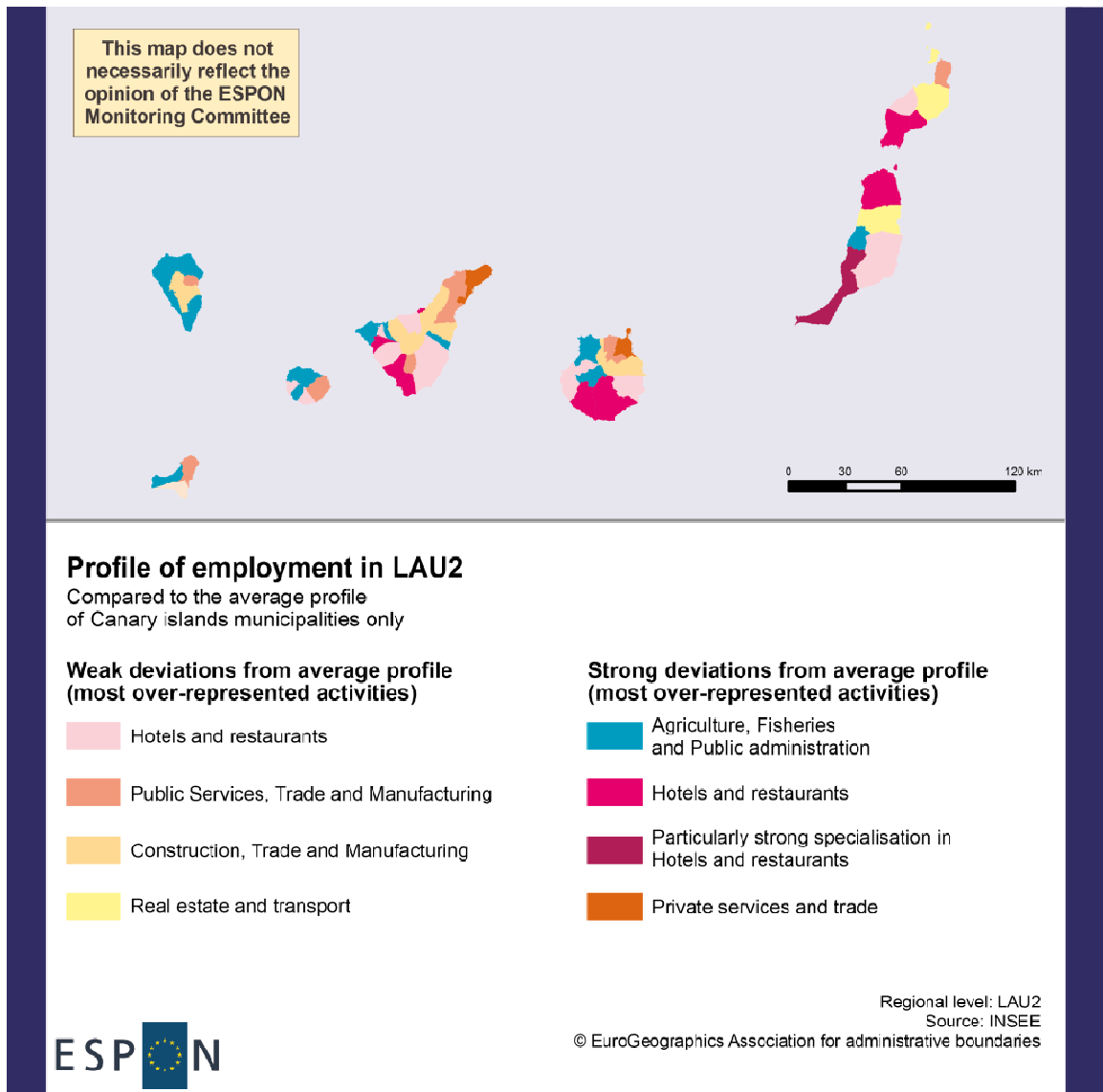


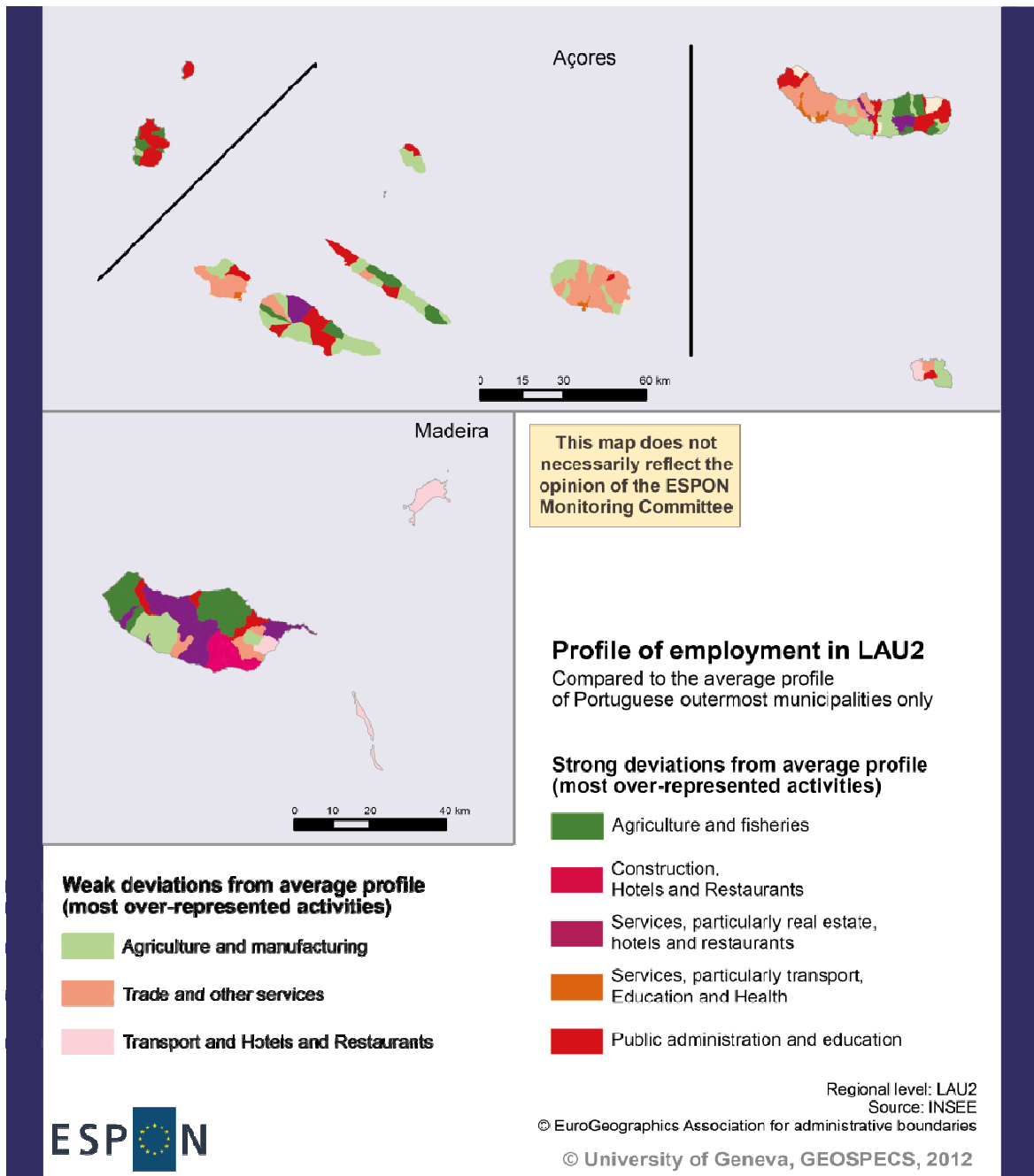
Figure 23 Structure of employment in the Outermost Regions.



Map 50 Profile of employment in the French Outermost Regions.



Map 51 Profile of employment in the Canary Islands.



Map 52 Profile of employment in the Portuguese Outermost Regions

Topography, land use and spatial connections

a) Land cover

Most Outermost Regions share two major characteristics in terms of land use. First, a very high proportion of their territories is designated as protected areas (over 40%, except for the Azores, and up to almost 80% in La Réunion) (Figure 24).

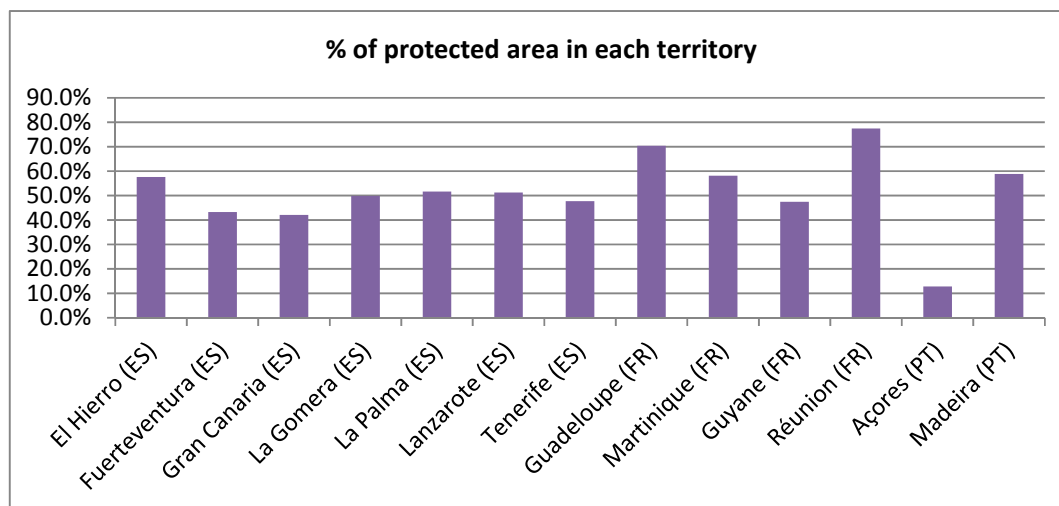
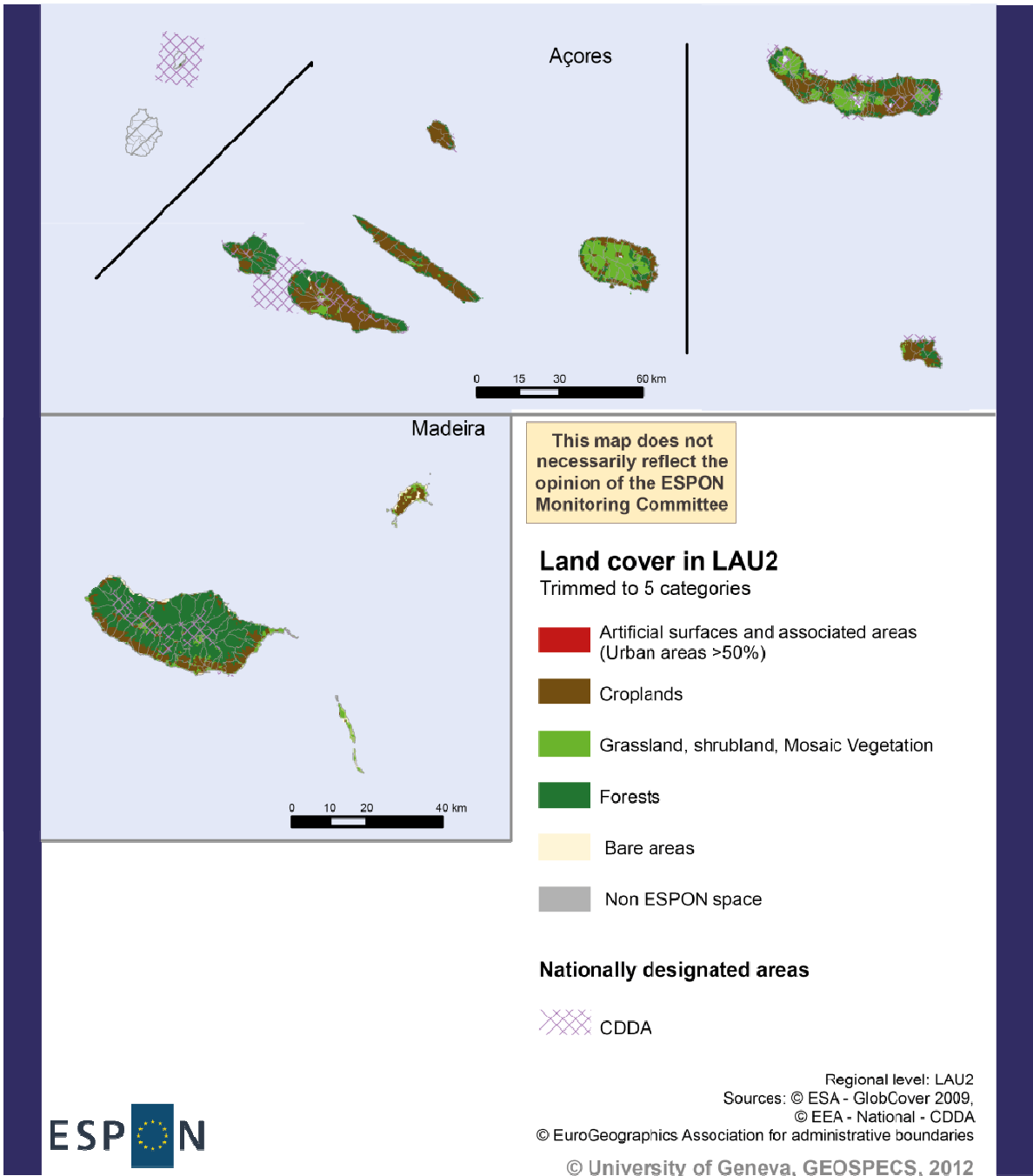


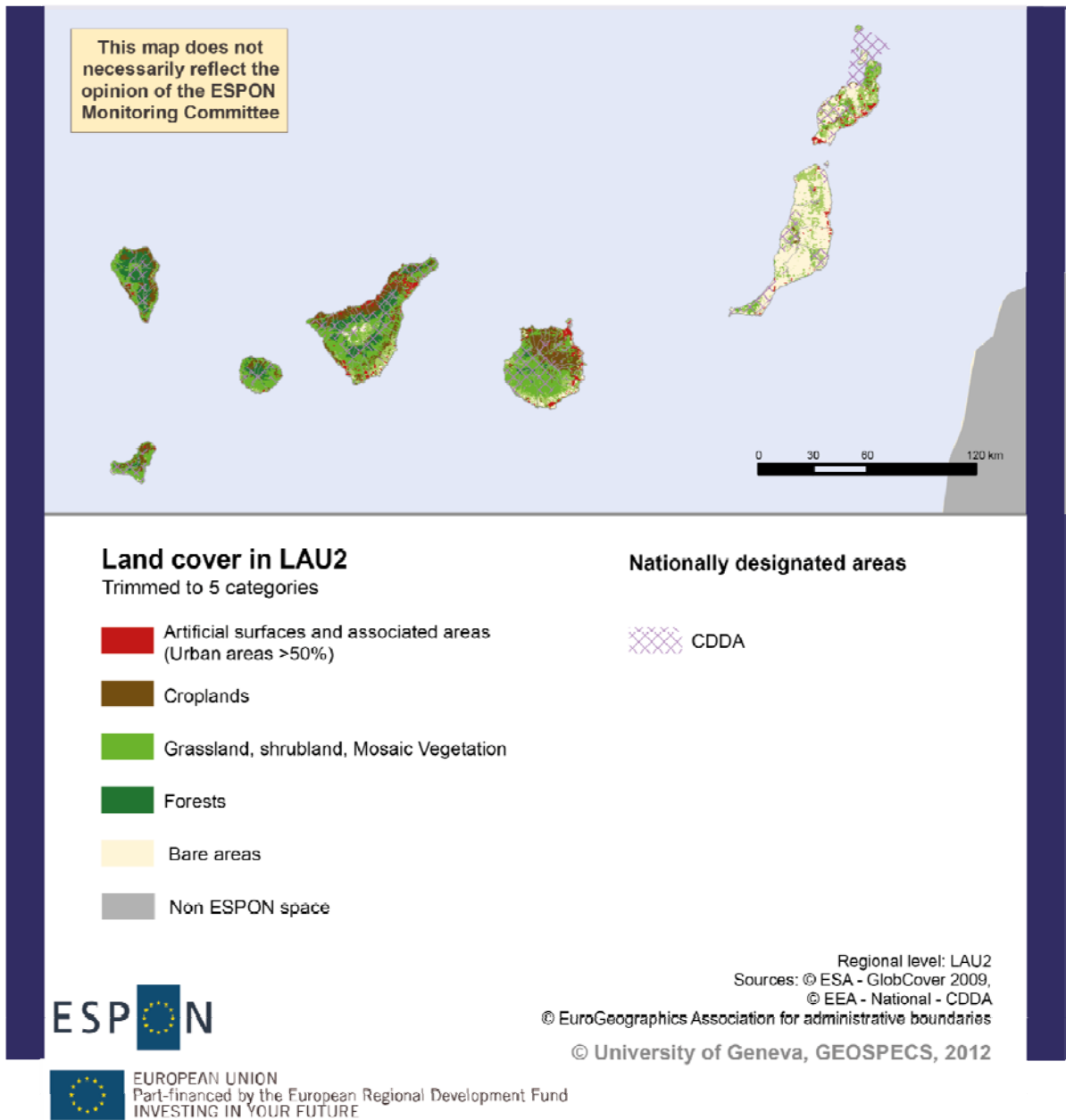
Figure 24 Percentage of each Outermost Region designated as protected areas.

The second characteristic is that urban areas are very concentrated (and thus densely populated, as mentioned above). This is due to several factors, including the high proportion of protected areas but also, in most cases, topographic characteristics that limit the development of densely populated areas to small parts of the territory. Most ORs are mountainous islands (some as archipelagos), which limits urban areas to sometimes very narrow coastal zones. Moreover, the economies of these ORs are still characterised by the cultivation of traditional crops (especially sugar cane and vines), that occupy an important proportion of their land. As for French Guyana, 96% of the territory is covered by rainforest, which leads to the same result: settlements are concentrated along the coast.

The result of these land use patterns (Map 53, Map 54) is that strong pressure is exerted on a small proportion of the total area of the ORs, in some cases exacerbated by major seasonal peaks (e.g., the high tourist period in the Canary Islands). This generates major land management issues, e.g., energy



Map 53 Land cover and protected areas on the Portuguese Outermost Regions.



Map 54 Land cover and protected areas on the Canary Islands.

generation and consumption, water use and treatment, waste management, traffic congestion and pollution.

b) Compartmentalized territories: accessibility and access to public services

The topographic characteristics of the ORs have consequences in terms of transportation and accessibility, both between ORs and the rest of the world and within each OR. As discussed below, as ORs are generally only slightly integrated into their regional environment, their relationships and exchanges with their homeland and with other EU Member States are particularly important. With regard to openness and connectivity, all ORs are not equal. The two capital islands of the Canarian archipelago (Gran Canaria and Tenerife), as well as of Madeira and the Azores, are well served by major air line connections. However, this is not the case for smaller islands, such as El Hierro or La Gomera which, though they have an airport, are served only by internal lines (Figure 25).

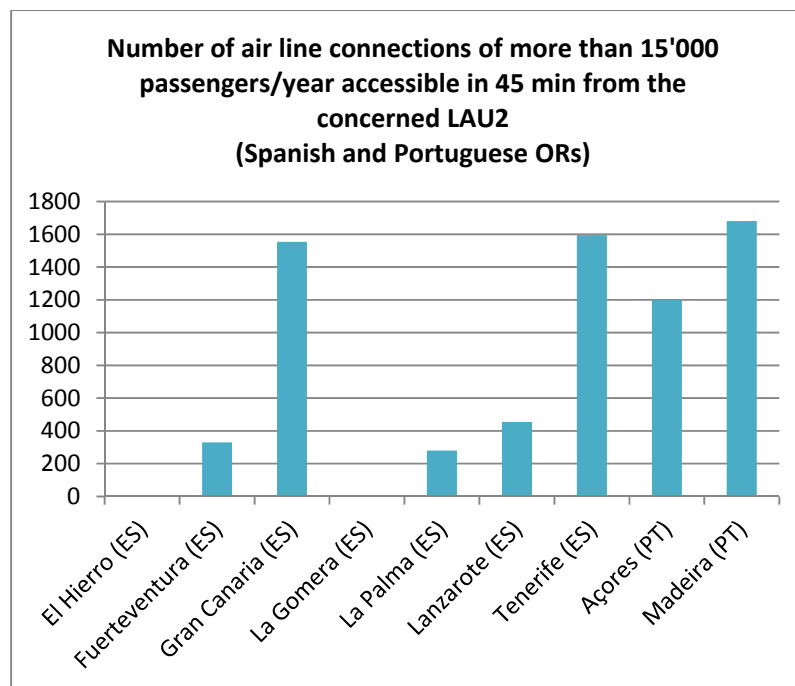


Figure 25 Number of airline connections from Spanish and Portuguese ORS.

For the French DOMs, information on the airports of Saint Denis in La Réunion and Cayenne in French Guyana provides an idea of the range of situations in terms of flight connections and travel opportunities. For the latter, it is remarkable that there are no flight connections with Brasilia or São Paulo in Brazil, or with the neighbouring State of Suriname. The number of internal lines is also rather low, especially in a territory where most areas are only accessible by air or by river (the latter being extremely time consuming – speed is reduced, trajectories are necessarily not optimal and travel from the coast to the interior requires upriver navigation).

	Rochambeau Airport Saint-Denis, La Réunion	Felix Eboué Airport Cayenne, French Guyana
Number of passengers in 2011	2.1 million	435,440
Number of companies, Of which non-French	5 2	3 0
Number of destinations Of which internal French Regional (non French) International hubs	22 0 6 cities (Paris: CDG and Orly) + Mayotte & New Caledonia 11 (Seychelles, Mauritius, Madagascar, South Africa) 4 (Paris CDG, Bangkok, Sydney, Johannesburg)	11 3 Paris Orly + Martinique & Guadeloupe 5 (Brazil [Amapá and Pará states only], Haiti, Santo Domingo, Florida USA) 1 (Miami)

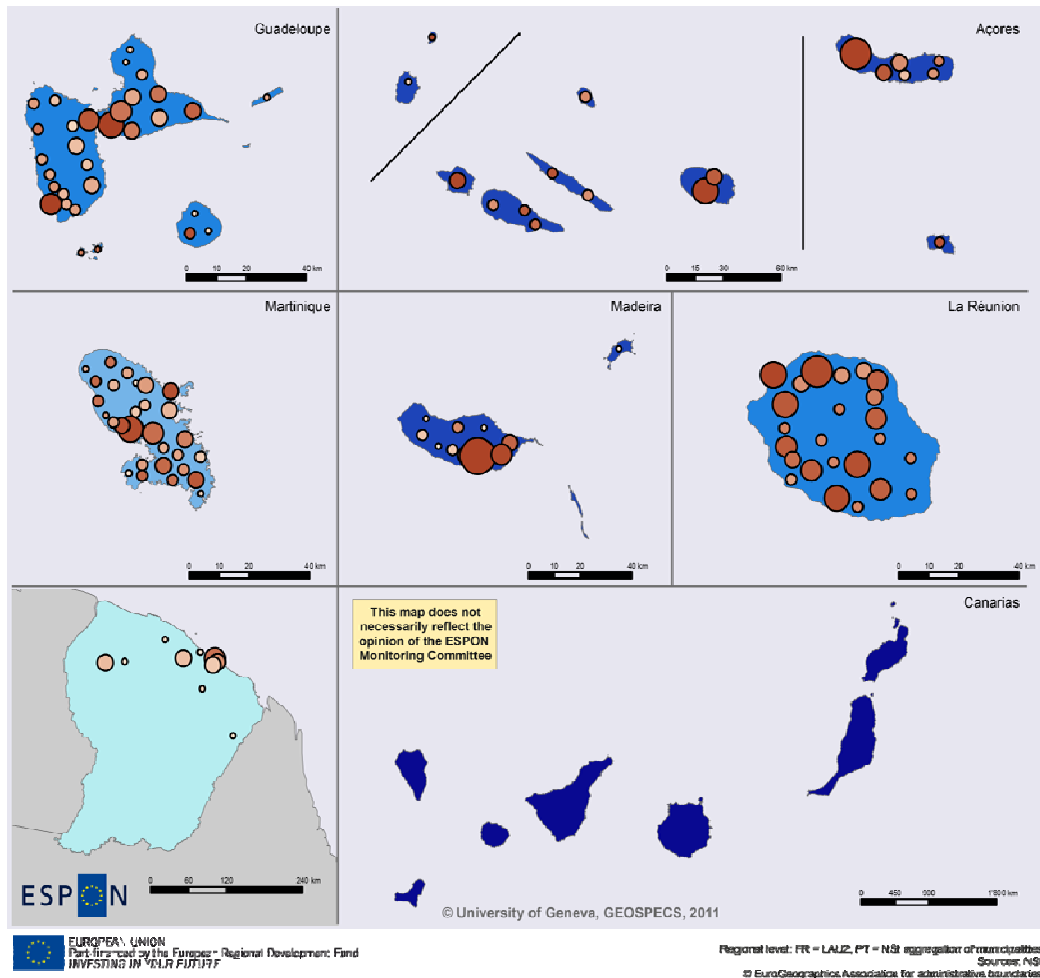
Difficult internal accessibility and compartmentalization is a widespread challenge among ORs. In most LAU2 territories, the entire area is accessible within a 45-minute drive from the coast. The exceptions are French Guyana (see above) and La Réunion, where relief is very sharp with a very limited number of passes suitable for vehicles and a whole area (Cirque de Mafate) is

not served by the road network. However, all ORs have internal connection issues. As all ORs apart from French Guyana and La Réunion are archipelagos, it is a major transportation challenge to provide all inhabitants with access (easy and regular access) to the whole region – and especially to its major urban areas where most services and goods are available.

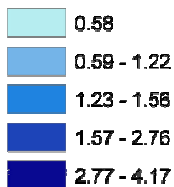
The challenge to provide public services, for example health care, in these regions thus depends on several factors: the availability of technical infrastructures and specialised workforce; their spatial distribution; and the existence of more or less efficient transportation networks and means. Figure 13 shows that the number of doctors available for 1000 people (ratio at NUTS2 level) is variable among ORs. In the Spanish and Portuguese archipelagos, it is relatively high. In principle, if the doctors are spatially well distributed, this large number can mitigate the challenges of access; however, in Flores and Corvo, the most Western islands of the Azores, for example, the number of doctors is rather low. In French Guyana, although internal connections are difficult, this proportion is also very low. Telemedicine solutions are gradually being developed overcome this lack, and to provide the population in all areas with satisfactory access to health care.

Number of doctors per 1000 habitants

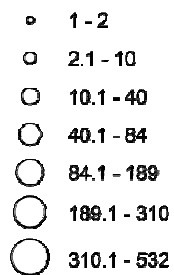
2010



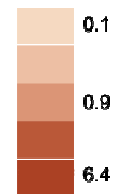
Doctors per 1000 hab. NUTS2



Number of doctors Lau1, Lau2



Doctors per 1000 hab. Lau1, Lau2



Map 55 Outermost Regions: numbers of doctors per 1000 inhabitants

Regional integration

Study of the employment structures of the ORs leads to the conclusion that each region is closer to its homeland than to other ORs. The data below tend to show that each region is also closer to its homeland than to its regional neighbours with regard to the level of development, conditions of life, and trade relationships. Several factors contribute to explaining this situation. ORs benefit from support from their homeland and from the EU, which is not (or far less) the case for neighbouring countries. This obviously has a positive impact on their level of development and on local conditions of life, as well as the wages of civil servants, of whom the proportion in these regions is particularly high. As for trade relationships, in spite of distance, the homeland and the EU remain the most natural partners. The use of a single currency and the absence of customs duty facilitate this, while other factors are barriers for external trade relations. Among these, European norms are first: goods produced by neighbouring countries often do not meet the EU standards and thus cannot be used in the ORs. In response, these countries adopt high duty tariffs and sometimes even norms that contribute to blocking imports from the ORs. Administrative procedures and the reliance of the French DOMs on the French national state for international relations issues also do not facilitate regional integration. Despite these common factors, major differences appear between the four geographic zones concerned.

a) The Caribbean area

This area comprises the 2 French DOMs of Martinique and Guadeloupe (and arguably also French Guyana), as well as their immediate neighbours: British, Dutch Antilles and other Caribbean independent islands. Data is provided below for some of these neighbours. In this area, life expectancy is rather high and birth rates are similar (Figure 26). Life expectancy in the French Antilles is slightly less than the French average, but the same as in Anguilla (UK) and higher than in other neighbouring islands. The birth rate is slightly higher than in France, but rather lower than among neighbours.

Major differences appear when one looks at the GDP per capita in the area (Figure 27). It is significantly lower in the French Antilles than the French average GDP per capita, but also significantly higher than in other neighbouring regions or states. In this respect, it appears clearly that the situation of the French Antilles is far more favourable than that of the British islands of Anguilla and even more Montserrat. Differences in terms of both national and European institutional statuses can account for these contrasted situations.

In terms of trade balance, the situation of the French Antilles also appears as peculiar in the regional environment: the economies of both islands are far less open than those of their neighbours (Figure 28). Martinique and Guadeloupe are less dependent on imported goods than their neighbours (less than 25% of GDP vs. over 60% in all other territories) and barely more than their homeland. Both islands are relatively bigger than their neighbours and rely far less on tourism; thus, they have more available space to produce (and receive financial and fiscal support by France and the EU for this), while their needs are more or less restricted to those of their own populations, which explains their relatively lower dependence on imports. Moreover, around 75% of goods are imported from France and the EU, which limits the openness of these ORs to their immediate environment.

In contrast, exports are very limited, whereas they represent 35 to 65% of GDP in the other territories. Regional exports represent only 2 to 3% of Martinique's and Guadeloupe's overall exports. However, it should be noted that data for the French Antilles do not include services (and hence tourism), whereas they do for all other territories. The strong weight of imports in the neighbouring islands is very strongly related to tourism, as the main source of foreign currency.

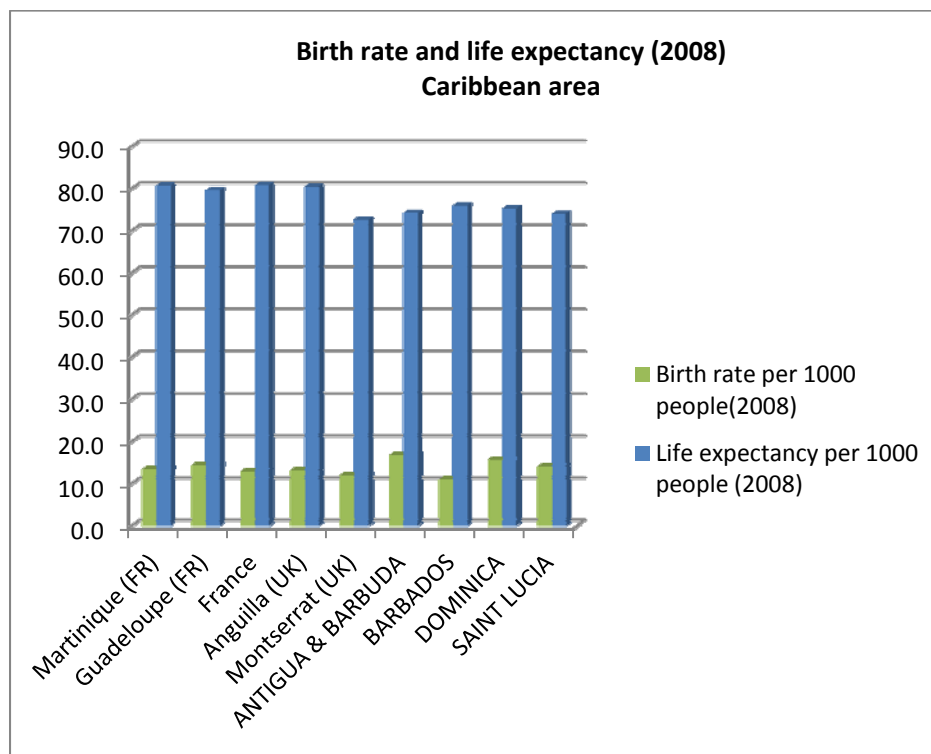


Figure 26 Birth rates and life expectancy on Caribbean islands and in France

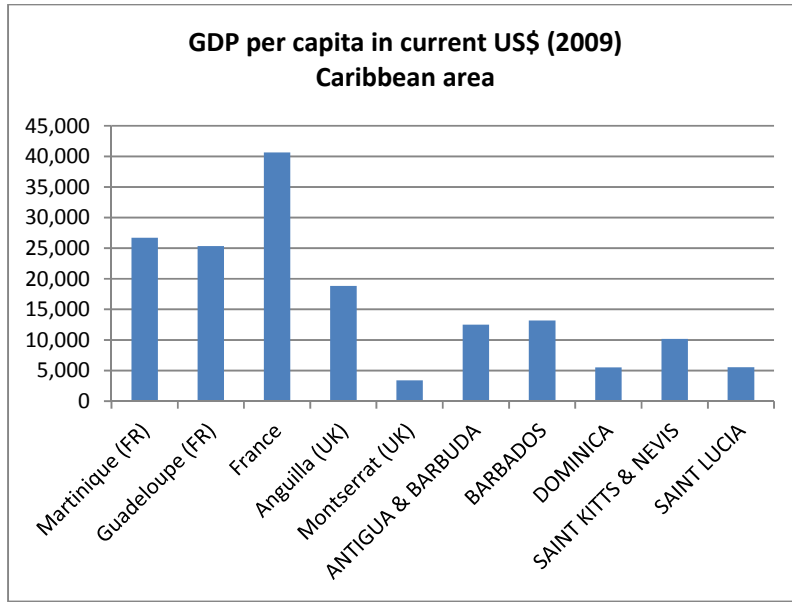


Figure 27 GDP per capita (US\$) on Caribbean islands and in France

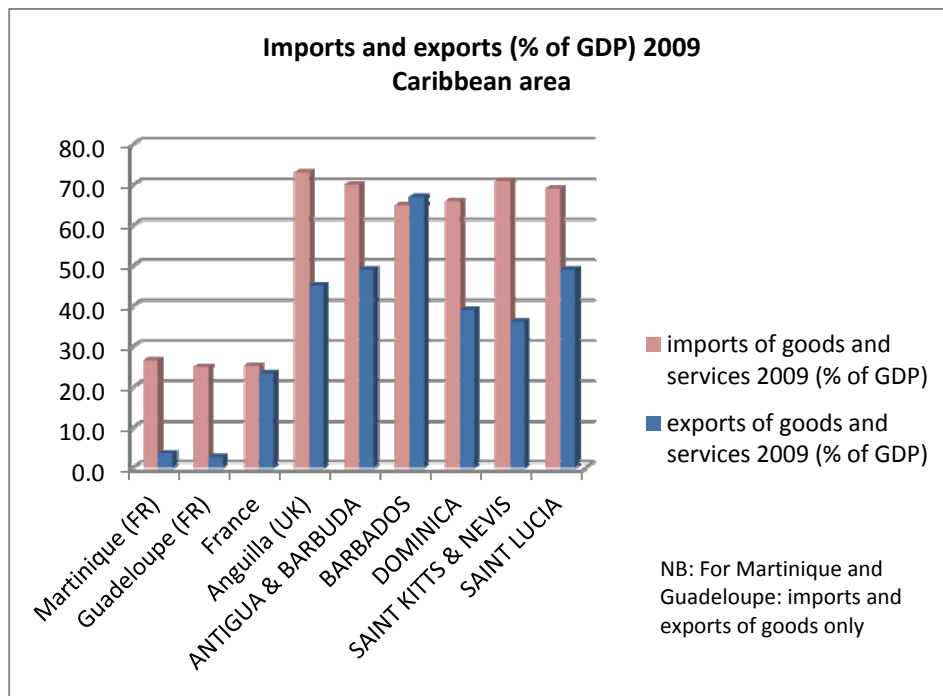


Figure 28 Imports and exports on Caribbean islands and in France

b) The Guyana Shield area

This area comprises French Guyana and its direct neighbours: Suriname and Guyana to the west, and the Brazilian states of Pará and Amapá to the east. The Caribbean Arc, including Martinique and Guadeloupe, is a secondary level of regional environment.

Life expectancy is high in French Guyana; it is slightly lower than the French average but significantly higher than in the neighbouring countries (Figure 29). Among the reasons that can explain this situation, one is the availability of high-level health care. The regional birth rate is very high: more than twice as high as the French average, but also higher than in the neighbouring countries/states. Both factors explain the dynamics of demography in this region, as well as immigration, particularly from Brazil and Suriname.

The average GDP per capita is much lower than the French average, and lower than in Guadeloupe and Martinique. It is, however, four times higher than in the neighbouring countries of Suriname and Guyana and the neighbouring Brazilian states of Pará and Amapá (Figure 30). Nevertheless, French Guyana's GDP is somewhat artificially pushed up by the spatial activities of the Kourou space centre. Given the small size of the population, the average GDP per capita is not completely representative of most inhabitants' conditions of life.

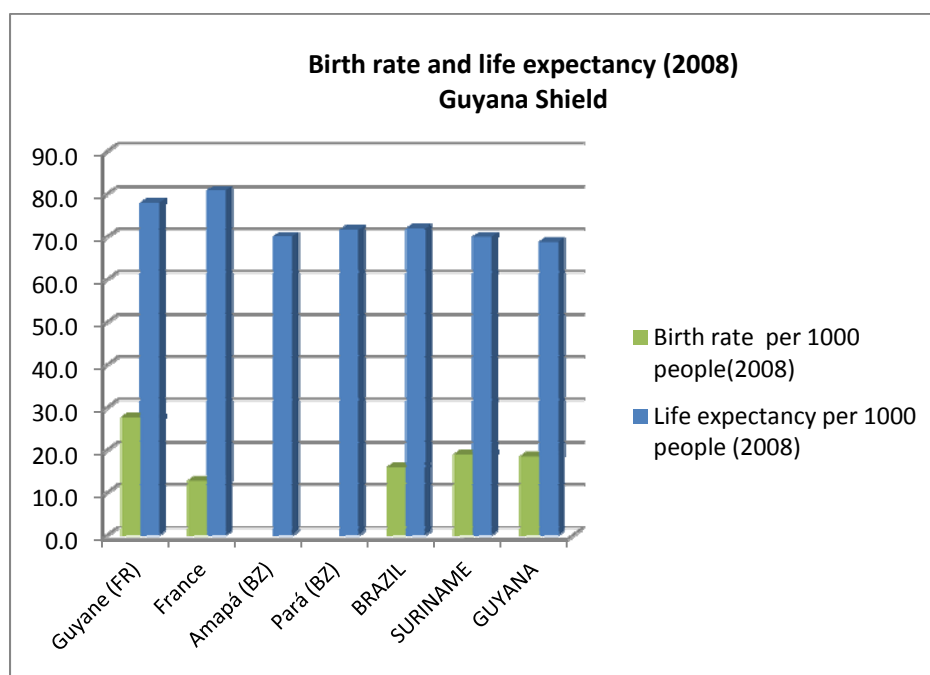


Figure 29 Birth rate and life expectancy, Guyana Shield and France.

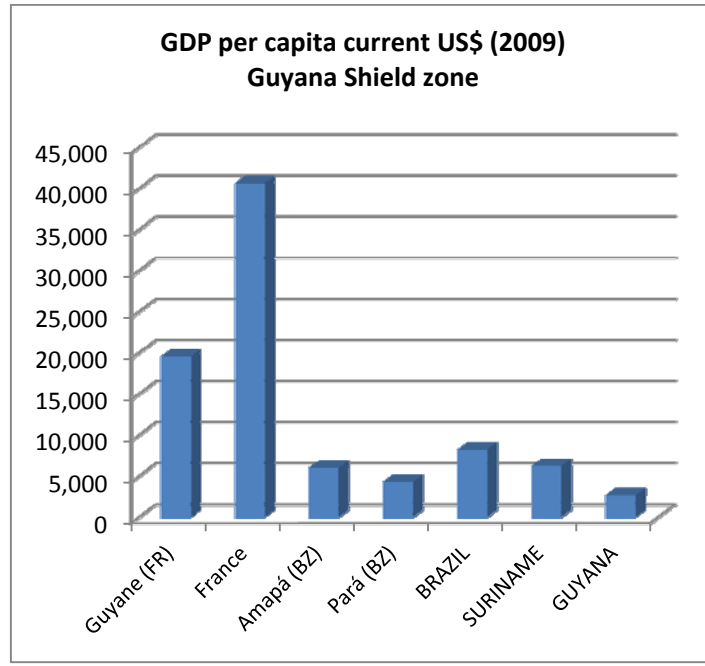


Figure 30 GDP per capita (US\$), Guyana Shield and France.

French Guyana is, however, a demographically dynamic enclave in a far less developed regional environment. This is also evident from trade relationships. French Guyana is extremely reliant on imports, essentially from France (41% of the total of exports in 2009), the EU (25%) and the French Antilles (10%). Imports from Central and Latin America only represented 10% in 2009. In particular, French Guyana imports oil and fuel from Martinique and Trinidad and Tobago. Exports are very limited and concentrated on gold, wood, fish and plastic elements. Guyana’s main clients are, again, continental France, the EU and the French Antilles. The Central and Latin America zone absorbs less than 3% of the region’s exports.

c) The Indian Ocean area

This area comprises La Réunion, as well as its nearest neighbours: Mauritius and Madagascar, and the countries of south-eastern Africa (Malawi, Mozambique, Zimbabwe and South Africa). The situations of these territories are particularly diverse.

In demographic terms, among the neighbours of La Réunion, Mauritius is definitely the one whose general profile is most similar (Figure 31). La Réunion has a high birth rate with regard to the French average, but this is significantly lower than the rates of most of its neighbours. Life expectancy is very close to the French average, and higher – if not much higher – than in the other countries. In this domain, La Réunion is clearly a French territory within a completely different environment, where access to French-standard healthcare is of utmost importance.

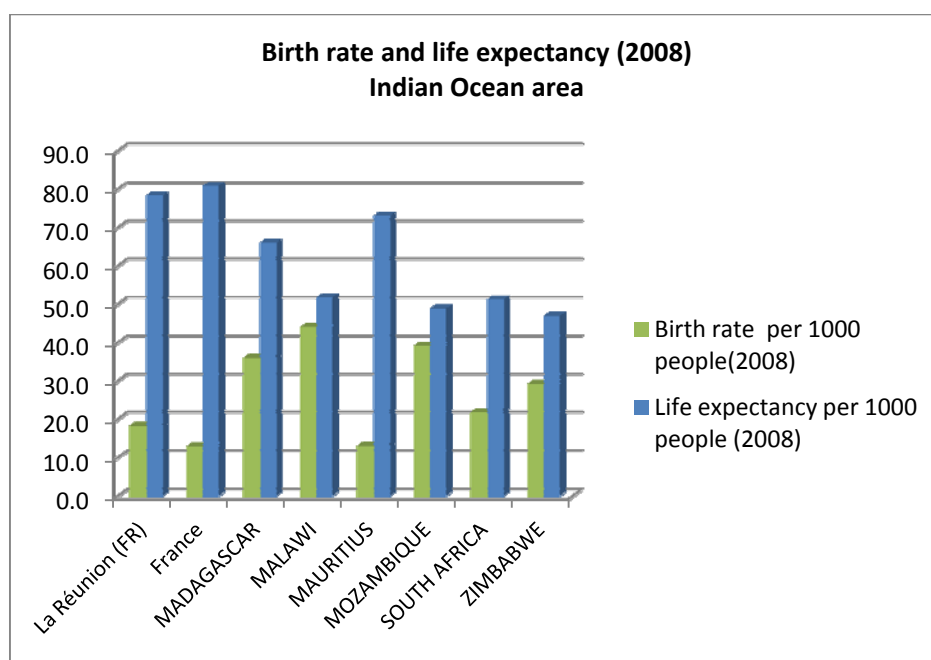


Figure 31 Birth rate and life expectancy: Indian Ocean area and France.

The average GDP per capita in La Réunion is slightly lower than in the French Antilles. The population in La Réunion is more numerous than in Martinique or Guadeloupe, and part of it is particularly isolated (in the volcanic, mountainous "cirque" areas notably). The unemployment rate is very high: 27.3% vs. a French average of 9.3% (2009). The GDP per capita in La Réunion is, however, well above those of the neighbouring countries. In Mauritius and South Africa, the most developed of these countries, GDP per capita is around 5000 US\$ (2009 data), i.e. almost a fifth of the level in La Réunion (Figure 32).

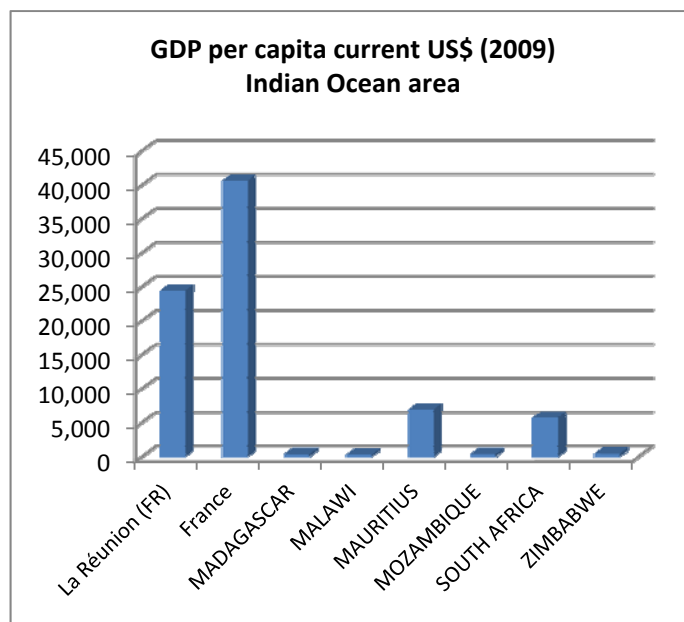


Figure 32 GDP per capita (US\$): Indian Ocean area and France.

In terms of trade relations, La Réunion (as other French DOMs) is far less open than its neighbours. It is very dependent on imports, more than France as a whole. However, despite the small size of the territory and its limited production capacities, the proportion of imports on the regional GDP amount to less than 30% of GDP, vs. 40% to over 60% in the area (Figure 33). The industrial base in La Réunion is stronger than in the other DOMs, but the production is almost completely absorbed by the population (import-substitution type of production) and exports are close to zero.

Imports entering La Réunion predominantly come from continental France and the EU (80% combined), vs. around 5% from the regional area. Within the regional area, South Africa is the main provider of La Réunion (mainly coal and intermediary products). Exports are mainly directed towards France and the EU, the second and third clients being Madagascar and China.

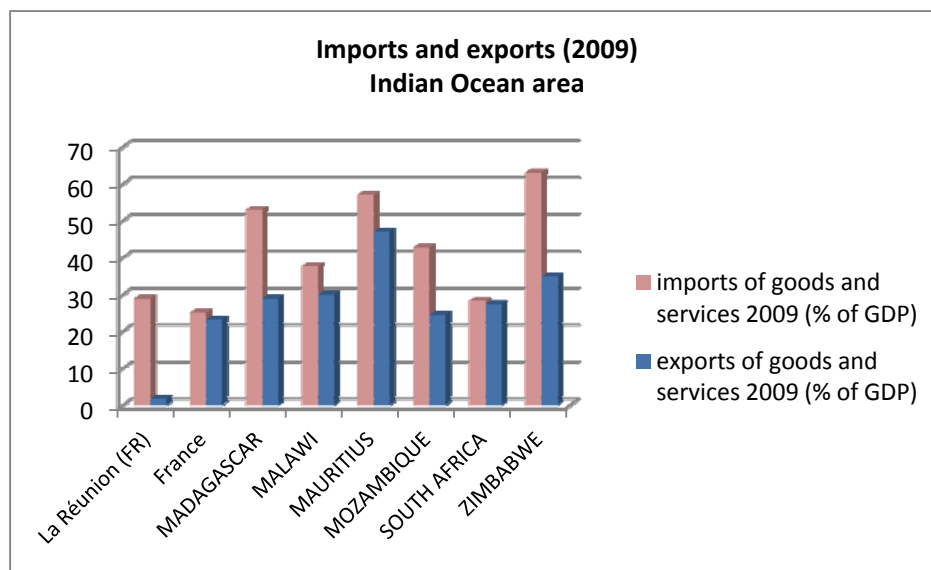


Figure 33 Imports and exports: Indian Ocean area and France.

Mauritius is also a main trade partner for La Réunion, although these relations are tense: both islands produce similar products, but production costs (especially wages) are much higher in La Réunion and EU external trade agreements (Economic Partnership Agreements) lead to the increasing opening of La Réunion to its regional competitors' markets with limited compensation to date. The agreed progressive reduction of Mauritian tariffs is still partial and the overall situation is increasingly unfavourable to La Réunion.

d) The Eastern Atlantic area

This area comprises the Portuguese ORs of Madeira and the Azores, the Spanish Canary Islands, as well as the neighbouring countries of Western Africa: Cape Verde, Morocco, and Mauritania. Some data are available for the contested region of Western Sahara. Given the location of the Azores, this area is very broad and probably less significant as a regional ensemble than the three others. Besides, due to the proximity of the EU, the relations of the ORs with other European Member States are all the more important.

Birth rates in the three ORs are very similar and very close to the averages of their respective homelands. As noted above, the Canary Islands are the OR with the lowest birth rate (below 10‰), below the Spanish average. Birth rates in the neighbouring African countries are two to three times as high, which accounts for radically situations in terms of demographic

dynamics. Life expectancy is slightly higher in the Canary Islands than in Madeira, but both are several years ahead of life expectancy in the area (Figure 34).

As for the French DOMs, ORs clearly are developed European territories in a less developed environment. Mauritania, although rich in natural resources, has one of the lowest GDPs in Africa; life expectancy is less than 60, and the birth rate is almost 35‰.

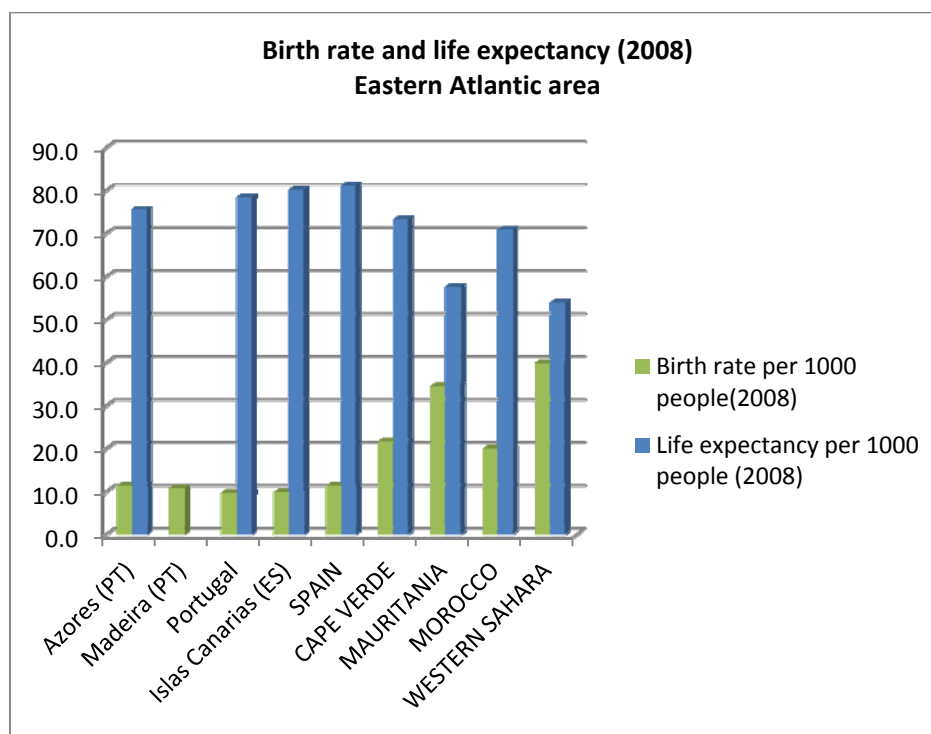


Figure 34 Birth rate and life expectancy, Eastern Atlantic area, Portugal and Spain

The gap between the ORs and their African neighbours in terms of GDP per capita is extreme: less than 5000 US\$ for Cape Verde and Morocco in 2009, against 20,000 for Madeira, and above 25,000 for the Azores and the Canary Islands (Figure 35). GDP per capita for the Azores is equivalent to the Portuguese average, but that of Madeira is much higher (over 5,000 US\$ per capita above the national average). The region strongly relies on tourism, as do the Canary Islands, and has developed an advantageous fiscal system that draws in foreign financial and industrial trade companies. GDP per capita in the Canary Islands is lower than the Spanish average – although

the difference is far smaller than between the French DOM and the French national average. The Canary Islands have followed a strong development path based on tourism. This trend is, however, losing its impetus (see case study on the Canary Islands) and wages remain among Spain's lowest.

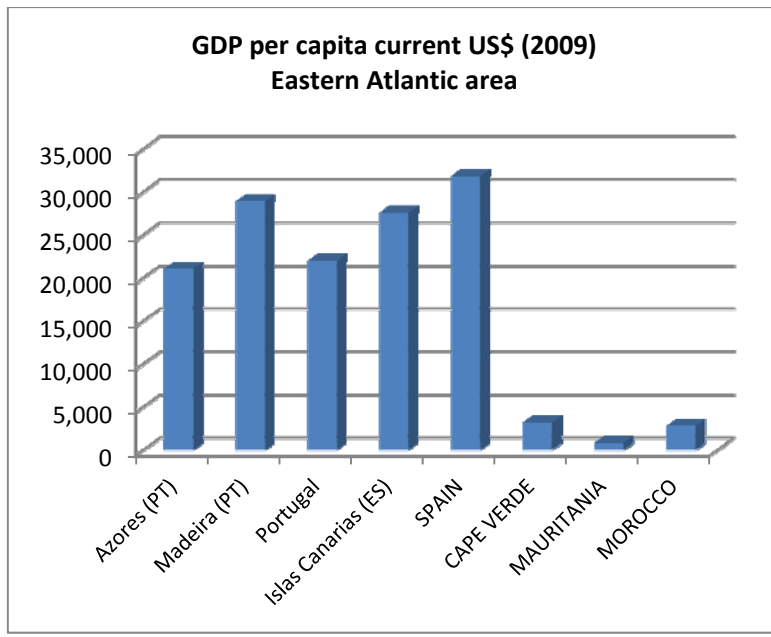


Figure 35 GDP per capita (US\$): Eastern Atlantic area, Portugal and Spain

With regard to trade relations (Figure 36), the economy of the Azores is very closed, whereas the Canary Islands follow a pattern that is apparently classical for ORs: imports represent almost 30% of GDP (slightly more than the Spanish average) while exports are very limited (around 5%), as production is absorbed by the local market.

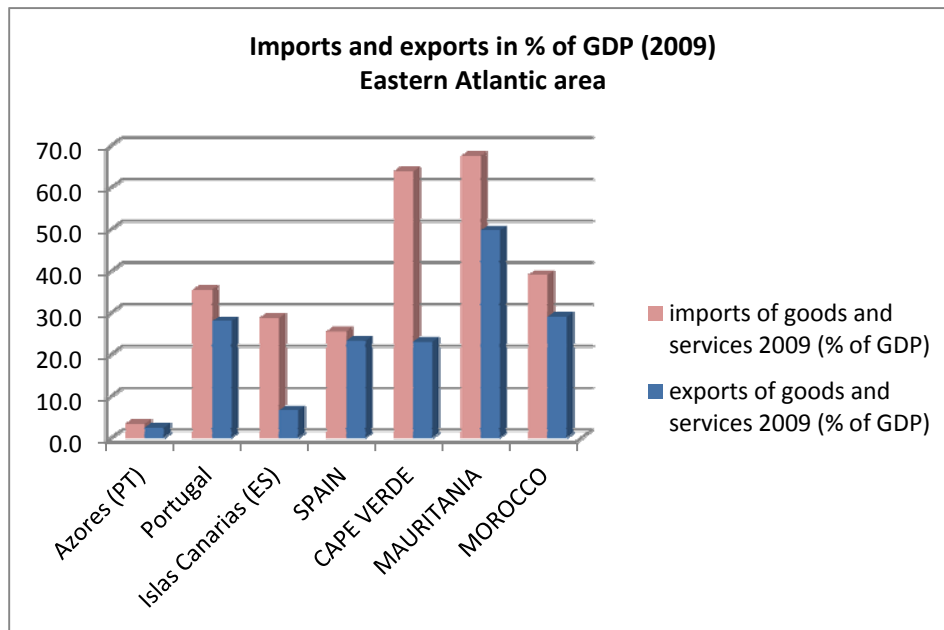


Figure 36 Imports & exports: Eastern Atlantic area, Portugal and Spain

In the area, neighbouring countries are far more dependent on imports, but they also export more (mainly natural resources). Trade relations between the ORs and their neighbours are very limited, although initiatives have been taken to establish and tighten links, particularly between the Canary Islands and Morocco. It must be noted that these initiatives are taken in a context where national authorities on both sides try to regulate illegal immigration.

Conclusion

The seven Outermost Regions (8 with Saint Martin, now administratively distinct from Guadeloupe) form a somewhat heterogeneous group in terms of geographical and topographic characteristics. Seven are islands, of which 6 archipelagos, one is a continental territory; four are located on or off the coasts of the American continent, three off the Western African coasts in the Atlantic Ocean and one off the Eastern African coasts in the Indian Ocean. All of these territories are - or are composed of - small, mountainous land areas whereas French Guyana is an immense territory with relatively flat relief. The French Antilles and La Réunion are located in tropical climate areas (although respectively in the Northern and Southern hemispheres), French Guyana is very close to the Equator, whereas the Spanish and Portuguese ORs are located North of the Cancer Tropic.

In spite of these diverse situations and specificities, the ORs share some structuring features and challenges. All of these regions are remote from the European continent and from their national homeland, to which they are tightly attached (administratively, economically, sociologically, historically...), and relatively little integrated in their wider region. From a socioeconomic point of view, ORs really are EU-regions in remote areas: development indicators show that, as well as trade exchanges data. ORs indeed exchange mainly with their homeland and the EU, but very little with their immediate environment.

As for their inner characteristics - the populations of these territories are, in average, young if not very young (French Guyana is a specific case in this sense, demography being particularly dynamic there). Due to several factors, in part at least linked to topography and soil use, this population is unevenly distributed throughout these territories. Remote, uneasily accessible or protected areas are very sparsely populated, whereas coastal areas and mainly urban centres are hosts to a very numerous and dense population. This creates some land use challenges that all ORs have to face, although for different reasons: energy, water, waste management...

These characteristics also make inner communications difficult. 96% of French Guyana is covered by rainforest, which means that most of the region's territory is only accessible by river navigation or internal aerial transportation (slow or costly). In the Canary Islands, composed of 7 inhabited islands, connections between two non capital islands (especially if small and not located in the same province) can prove complicated. This of course makes it a challenge for local authorities to provide their citizens with satisfactory access to public services (health and education in the first place).

4.2 Synthesis of quantitative findings

Given the wide range of geographic specificities covered by GEOSPECS, quantitative analyses are necessarily limited to the most important aspect for each of them. Considering the diversity of GEOSPECS areas, in terms of development issues and relevant scales of analysis, heterogeneous sets of maps and analyses are presented for each geographic specificity. The TPG does not consider it meaningful to compare territorial patterns and trends observed within different geographic specificities. The objective of the present section is to describe how the different geographic specificities can be approached quantitatively, based on their respective characteristics.

Data availability has largely influenced the analyses carried out within GEOSPECS. However, given the novel character of the data that have been compiled and the indicators that have been constructed, the TPG has only explored a small proportion of the potential innovative quantitative analyses that could be envisaged. Data at the level of the ESPON space's 125,049 LAU2 units¹²⁵ open new perspectives for multi-scalar analysis.

Units of analysis

In order to undertake Europe-wide analyses for GEOSPECS areas, subdivisions in units of analysis were needed:

- Mountain areas were subdivided in 16 massifs (see section 1.2.1), adapted from the subdivision used in the European Environment Agency's report on Europe's mountains (EEA, 2010). These massifs are more extensive than those used in the 2004 DG REGIO Mountain Study (Nordregio, 2004), which focuses on identifying mountain units recognised by national stakeholders. However, the smaller number of massifs makes European comparisons easier.
- For islands, the TPG has identified 319 islands and island municipalities. Multiple islands belonging to one municipality have been considered as one unit, substantially decreasing the number of island units identified in the data set. This rationalisation applies to Greek islands which form part of the same municipality, as well as to a number of islands in Norway, Finland and Sweden. Multiple municipalities which form part of

¹²⁵ Excluding the Former Yugoslav Republic of Macedonia and Bosnia and Herzegovina, for which LAU2 delineations have not been compiled.

one island have been grouped together. Where part of an island is covered by one or more insular municipalities, while another part is covered by a municipality which is partly on the mainland, the municipalities that are entirely insular are the only ones considered.

- Sparsely populated areas (SPAs) have been subdivided into 39 "Sparse territories", defined as "clusters" of SPAs that form relevant geographical units for developing a spatial analysis of SPA and coherent territories for developing integrated 'regional' economic spaces (see section 3.2.3 of the scientific report).
- For coastal areas, the TPG has identified areas within 45 minutes and within 90 minutes of individual coastlines. These areas overlap, as a single municipality can be within these travel times from multiple coastlines (e.g. in Denmark, a number of LAU2 are within 45 minutes of both the Baltic Sea and the North Sea). The coastal areas have also been subdivided by country.
- Similarly, the TPG has identified areas within 45 minutes and within 90 minutes of each border between two countries. These areas overlap, as a single municipality can be within these travel times from multiple borders (e.g. Basel is within the border areas between Switzerland and Germany and between Switzerland and France). Border areas have been subdivided by country.
- Each Outermost Region has been considered as one unit of analysis.

The units of analysis have been analysed as both geographical units for which overall indicators can be calculated, and territorial contexts for the assessment of internal disparities.

Issues and themes

This section identifies how TPG members have applied different methods to analyse similar themes and issues in different GEOSPECS categories.

Age structures and demographic trends

For a number of geographic specificities, comparisons between age structures in GEOSPECS areas and national average values show contrasting patterns. In mountain areas, some massifs have significantly lower proportions of children (e.g. Pyrenees and Massif Central in France, Polish Middle mountains), while others have high proportions of children

(e.g. Polish Carpathians). Similarly, areas within 45 minutes of a coastline may have higher proportions of elderly people than the national average (e.g. in Greece and along the North Sea in the UK), or lower proportions (e.g. in Bulgaria and Latvia). In the Outermost Regions, French Guyana stands out due to exceptionally high birth rates (27.7 ‰, compared to 12.9 ‰ on average in France), as well as children, 35 to 49% in most LAU2. At the other end of the scale, the Canary Islands have relatively high proportions of elderly people, especially in rural and isolated areas.

Demographic trends have particularly been analysed in SPAs, as population decline is a particularly important issue in areas that run the risk of falling below critical population thresholds for maintaining service provision levels and a sustainable labour market. Unfortunately it has only been possible for the TPG to compile LAU2 data on total population for the years 2001 and 2006. Current initiatives to compile harmonised LAU2 population figures for previous decades would, if successful, make it possible to carry out a wide range of statistical analyses in GEOSPECS areas.

Patterns of employment

Multi-scalar analyses of patterns of employment have been produced for a number of GEOSPECS categories. In ORs, factorial analyses of employment patterns shows that the French, Spanish and Portuguese ORs have distinct profiles, respectively characterised by an over-representation of public services (France), hotels, restaurants and construction related activities (Spain) and agriculture and fisheries (Portugal). To identify internal structures of employment within ORs, it is thus more meaningful to produce ascendant classifications of LAU2 employment profiles with these national groups, than across all ORs.

Similarly, in mountain areas, a first map compared the relative weights of the primary, secondary and tertiary sectors of activities in Europe's 16 massifs subdivided into their national parts and showed, for example, the relative over-representation of agriculture in the Romanian Carpathians. An ascendant classification of LAU2 employment structures in the Carpathians confirmed this contrast between its Slovak and Romanian parts, but also makes it possible to identify the more local contrasts and similarities across national boundaries.

In SPAs, the focus on local contrasts seemed less relevant, as the main urban areas are per definition excluded from this GEOSPECS category. The combination of a comparison of the relative weights of the primary, secondary and tertiary sectors and a factorial analysis of employment structures by branch shows that employment profiles are relatively similar

within large trans-national areas such as the Nordic countries, the Iberian peninsula, and south-eastern Europe. This suggests that, from the point of view of employment structures, sparsity could more meaningfully be approached within these trans-national areas.

For coastal areas, there is no general "employment profile" from either a European or a national perspective. Some coastal areas have a strong overrepresentation of the fisheries sector compared to national average values (e.g. Gulf of Cádiz in Spain, Iceland). Only the Danish and French coastal areas along the North Sea have a significant over-representation of the manufacturing sector, while transport and storage activities are most over-represented along the coastlines of Slovenia, Cyprus and Belgium. Considering this diversity of situations, a general factorial analysis is less meaningful; it mainly reflects differences in national employment structures.

Tourism

Tourism is evoked as an important sector of activity and/or potential development opportunity for most GEOSPECS areas. In the quantitative analyses, the proportion of employment in hotels and restaurants (NACE branch H) is often used as a proxy for the relative importance of tourism. The example of the Alps, where this indicator could be crossed with the number of beds per LAU2 (see section 4.2.1), shows the added value and limitations of each of these proxies. Close to major cities, one finds many municipalities with significant proportion of employment in "branch H", but no accommodation. Conversely, in many intermediate areas between the outer borders of the Alps and the attractive high-altitude skiing resorts, many LAU2 have proportions of employment that are relatively lower than one might expect, considering the number of beds. This gives some indication of the differentiated effect of a number of tourists (estimated on the basis of the commercial offer for overnight accommodation) and employment. It also illustrates that the leisure economy also includes services for neighbouring urban areas, for owners of second homes, and for the local permanent population in GEOSPECS areas.

The trans-national comparison of employment in tourism in ORs makes it possible to highlight the relative weakness of the tourism sector in the French ORs, which contradicts the general perception of these regions in France.

The analysis of tourism for islands has identified different patterns according to groups of islands, distinguishing not only between the more tourism-intensive Mediterranean islands and the rest, but also showing

that medium-sized islands with a population of 100,000 to 1 million inhabitants have the largest proportions of employment in tourism.

In coastal areas, the focus is on the concentration of tourism activities in a limited number of LAU2 contiguous to the coast. Employment rates in hotels and restaurants are almost systematically higher along the coastline than within the area within commuting distance from the coast. The extent of these differences gives an indication of the extent to which tourism is concentrated on the coast. However, differences between portions of the coastline also play a role, calling for detailed analyses of individual coastal areas to identify those with the highest degree of concentration of tourism in a limited number of locations.

Accessibility

Access to urban areas and to key infrastructure such as airports is of key importance, and can generally be considered as having a greater direct influence on socio-economic patterns and trends than geographic specificities. Different analyses have therefore subdivided GEOSPECS areas on the basis of their access to urban areas. In the analysis of Northern SPAs, Sparse Territories with a relatively better access to urban centres have been analysed separately. The analysis for islands separates them according to their total population. Mountain massifs have been characterised on the basis of the proportion of area and population living within commuting distance of cities of different sizes, showing major differences between, for example, the Carpathians where only 23% of the mountain population is within commuting distance of an urban area, and Central European middle mountains which are almost entirely within commuting distance of such centres. Cross Border Metropolitan Regions have been analysed separately from other border areas (see Annex 36) and a separate typology of these areas has been produced.

Comparisons of access to airport between mountain areas and national average values show that the proportion of people living within 45 minutes of an airport is almost systematically lower in mountain areas than for each country taken as a whole. However, the extent of this difference varies considerably. For islands, the distinction between islands with and without an airport is such that these have been analysed in separate groups, as illustrated by the nexus models (see section 3.2).

Conclusions

The different ways in which the same indicators have been processed and interpreted illustrate the various types of concerns in different GEOSPECS

categories. Furthermore, there have been important variations with regard to the scales of analysis considered relevant, the ways in which different levels of analysis are related to each other, and the territorial contexts used to produce comparisons. This demonstrates that GEOSPECS areas cannot be analysed as one group, as well as the diversity within each GEOSPECS area with regard to many variables.

The GEOSPECS project therefore demonstrates that quantitative analyses of each geographic specificity should be carried out as a separate project. At the same time, these analyses require compilations of LAU2 data and data processing which are most efficiently carried out at the level of the ESPON programme as a whole. This calls for an alternative organisation of data collection and quantitative analysis.

5. Case studies

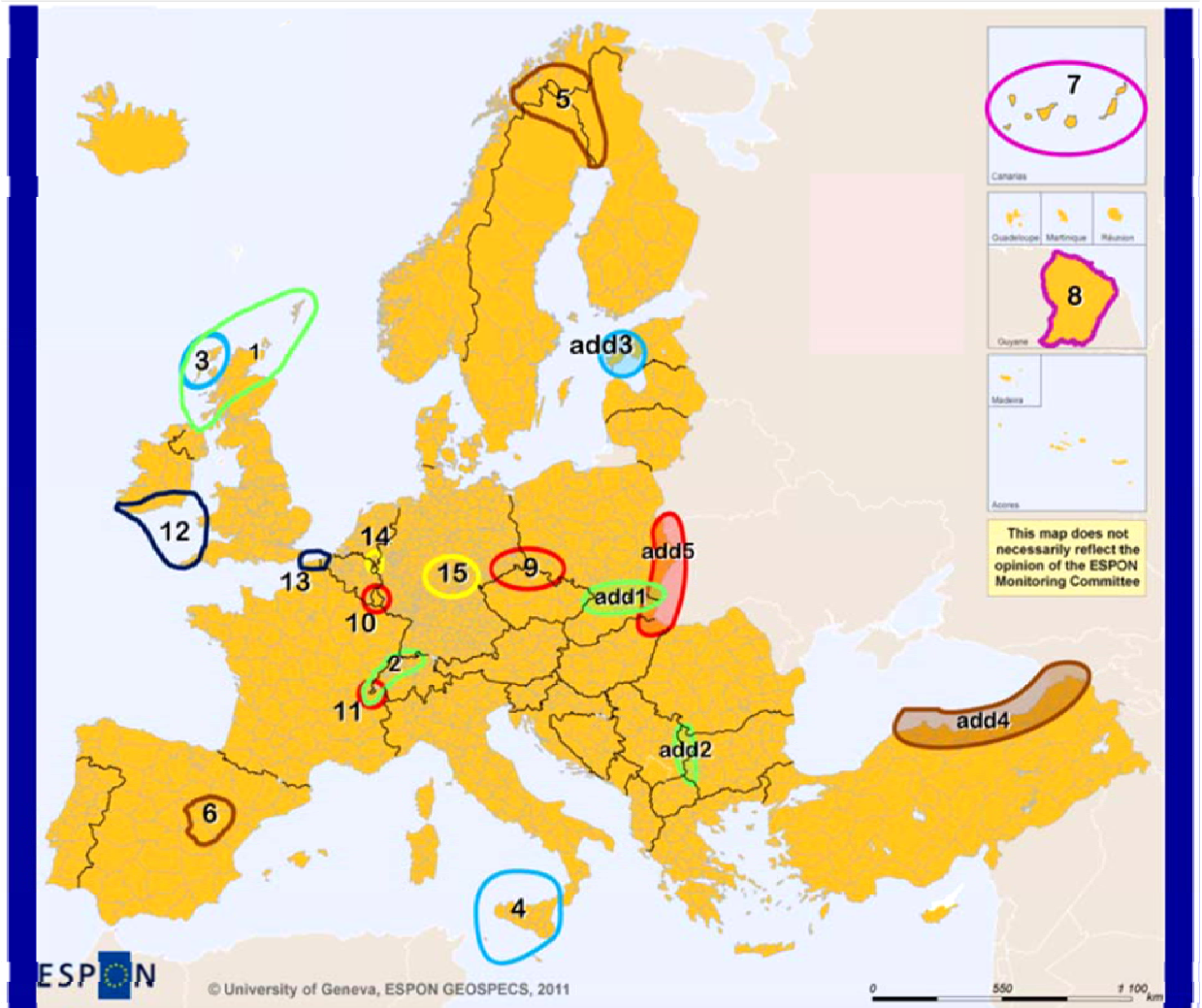
5.1 Overview of case studies

The aim of the case studies is to relate the findings of the quantitative, European-wide analysis of GEOSPECS categories to the regional level, i.e. to obtain a more in-depth understanding of challenges, opportunities and development processes in specific regions. These qualitative enquiries attempt to identify local methods of dealing with geographic specificities, i.e. overcoming challenges related to them and exploiting their potentials.

The topics investigated in the case studies were inspired by the transversal themes. The questions for analysis can be found in the analytical matrix (section 2.1.).

GEOSPECS carried out 15 case studies (2 for mountain areas, 2 for islands, 2 for SPAs, 2 for coastal areas, 2 for OR, 2 for Inner Peripheries and 3 for border areas). Since several of the case study areas feature more than one geographic specificity (i.e. overlaps of different categories), the case studies are particularly apt to demonstrate what the presence of geographic specificity means for the local population. 5 “additional cases” were added – these are not a full case study, but rather a targeted analysis of one particular topic. The “additional cases” shall compensate for a lack of case studies in the EU12 and candidate/pre-accession countries (seeing that the TPG does not dispose of sufficient language capacity to conduct full case studies in these countries).

A detailed version of all case studies can be found in the Annexes 24-44.



Case studies and "additional cases" in ESPON GEOSPECS

- | | |
|--|---|
| <p>Mountain areas</p> <ul style="list-style-type: none"> ○ (1) Highland and Islands ○ (2) Jura ○ (add1) Tatra region ○ (add2) West Stara Planina <p>Islands</p> <ul style="list-style-type: none"> ○ (3) Outer Hebrides ○ (4) Sicily region ○ (add3) Saaremaa <p>Sparsely populated areas</p> <ul style="list-style-type: none"> ○ (5) Tornedalen ○ (6) Central Spain ○ (add4) Coastal areas along the Black Sea | <p>Outermost regions</p> <ul style="list-style-type: none"> ○ (7) Canary islands ○ (8) French Guyana <p>Border regions</p> <ul style="list-style-type: none"> ○ (9) Czech-Polish-German border ○ (add5) Polish-Ukrainian border ○ (10) Luxembourg CBMR ○ (11) Geneva CBMR <p>Coastal areas</p> <ul style="list-style-type: none"> ○ (12) Celtic Sea ○ (13) Belgian coast <p>Inner peripheries</p> <ul style="list-style-type: none"> ○ (14) Parkstad ○ (15) Rural area in the heart of the metropolitan Saxony triangle |
|--|---|

Map 56 Overview of case studies

5.2 Case study reports

5.2.1 Mountains: Case study reports

Highland Council area, Scotland

Many geographic specificities overlap in the Highland Council area. First, the Highlands are obviously a mountainous area. Second, most of the outer boundaries of the Council area are coasts. Thirdly, it includes some islands, of which the Isle of Skye is best known. Finally, with an average population density of 9 persons per km², the Highlands are among the most sparsely populated areas in Scotland and Britain, and even Europe. While one might argue that the mountainous terrain is a factor accounting for the sparseness of population, historic events have also strongly contributed. Before the 19th century, the Highlands were home to a much larger population depending on subsistence agriculture, including transhumance. The Highland Clearances forced thousands of people to emigrate to the lowlands or overseas. These processes were partly linked to agricultural changes throughout the UK, but also to other factors, such as the Industrial Revolution and the outlawing of the traditional Highland way of life after the unsuccessful Jacobite rising of 1745. Current settlement patterns remain strongly influenced by these events in the 18th and 19th centuries.

Today, the combination of geographic specificities influences the socio-economic structure of the area in many ways. On one hand, the “attractive”, “unique” landscape serves to attract tourists and amenity migrants, making tourism the most important branch of employment after the public sector. On the other hand, the provision of services of general interest is much more expensive in a setting where people live in dispersed small settlements. The higher costs for transportation, in terms of time and money, due to the rugged terrain, reinforce these challenges. In addition, the area (apart from Inverness) is less attractive for businesses than an urban agglomeration, and the resulting lower number of employment opportunities means that many young people move away.

It must be kept in mind that there are strong regional variations in the economy of the Highlands. A successful core around the Moray Firth (including Inverness) has to face different challenges than the more outlying areas.

Tourism: In the Highlands, tourism is a significant part of the local economy, accounting for 13.5% of employment (excluding self employment), and around £584 million in overnight visitor expenditure. About 2.34 million overnight trips are made to the Highlands each year. The landscape is key in attracting visitors. According to the survey “The Visitor Experience” (Harris Interactive, 2008), 90% of visitors declared

that “scenery” was an important or very important factor in choosing Scotland as a holiday destination – making it the most important factor overall. The landscape also serves as a backdrop – or even “resource” – for a number of outdoor activities, ranging from mountain biking to canoeing, from rock climbing to bird watching. A study from 2003 found that 63% of visitors to the Highland Council area participated in some sort of sporting activity. The most popular were low-level walking of between 2 and 8 miles (46%), or over 8 miles (11%) and hill walking (21%). However, tourism in the Highlands is very seasonal, with almost two-thirds of UK and 84% of overseas visitors between April and September (Highland Area Tourism Partnership, 2006).

Transport and access to services: It is particularly the dispersed settlement pattern that creates additional costs for the local authority: “Highland has the greatest length of roads and the largest number of bridges to maintain of any other local authority in Scotland” (Highland Council, 2009). The sparse population not only creates challenges for the maintenance of an adequate road network, but also makes the provision of public transport unprofitable in most cases: “Bus services are far less frequent in the region. The ability to run profitable services has been weakened by the dispersed settlement pattern. [...] The region’s rail network is limited, offering no coverage of the region’s north-west and with infrequent services on most lines” (Scottish Government, 2008). Thus, local people are forced to rely on private cars for their mobility. The table below shows that, across Highland, accessibility to public transport is lower and car dependence is higher than the average for Scotland. Therefore those without cars in the largely rural areas can face issues of social exclusion.

	% of households (2005/06)			
	People who drive every day	1 or more cars	Greater than 14 mins to nearest bus stop	Less frequent than 1 per hour bus service
Highland	47%	78%	9%	20%
Scotland	41%	68%	3%	4%

Figure 37 Accessibility indicators in Highland; Table taken from: Highland Council, 2009

The mountainous terrain works to reinforce the challenges deriving from sparseness. Much of the road network across rural areas is characterised by winding single carriageway roads with passing places, resulting in relatively long journey times. The mountainous terrain also increases the

efforts that are necessary to keep them passable: “In the Scottish Highlands, the combination of hard metamorphic and igneous rocks, glacially steepened valley slopes and high rainfall is ideal for generating debris flows and slides” (Transport Scotland, 2008). Landslides affecting the road network occur somewhere in the Highlands almost annually. Many affect only minor routes – but these can be locally very significant, in some cases being the only access routes to remote communities (Transport Scotland, 2008).



Image taken from: Transport Scotland, 2008

The delivery of Services of General Interest is doubtlessly more challenging in sparsely populated areas than in others, a situation which has led to complaints by the affected regional authorities. Highland Council has stated that it incurs additional costs in excess of £12 million per year to provide services to the 26% of its population which live in supersparse areas¹²⁶, i.e. that it spends about £12 million more than it would need to if those people lived in an area similar to the lowland coastal town of Nairn. In addition, some services are delivered at lower levels in the supersparse areas, and Highland Council estimates that it would cost it more than £800,000 to bring these services up to the levels provided in other, more densely populated, areas (Highland Council and Argyll and Bute Council, 2004).

ICT: “Telecoms connectivity is inherently more commercially attractive in urban areas due to the lower deployment costs per user. In the Highlands and Islands, as with most rural areas, it is more challenging to put forward a convincing case for widespread telecoms connectivity provided by the private sector” (Highlands and



Loch Barraglom, Great Bernera
Photo: Gary Faux

¹²⁶ The definition used in this study for a “supersparse area” was anywhere which was more than 40 km (25 miles) by road from any settlement with a population of 7,000 or more in the 2001 census.

Islands Enterprise, 2009). Nevertheless, the Highlands and Islands do not compare unfavourably with the rest of the country: ADSL coverage (at any speed) is 95%, compared to the UK average of 99.8%. In fact, levels of ADSL coverage in the Highlands and Islands are better than rates in many major economies (e.g., Japan, Spain, Italy, Germany or the USA). This is in large part due to significant public sector investment in telecoms, such as the projects "Broadband for Scotland", "The Broadband Reach Project" or "Connected Communities".

Due to this high level of broadband coverage, the area has been quite successful in attracting a number of *call centres* (and associated employment opportunities). Pilot projects exploring the opportunities for *teleworking* are underway. As for other sectors: There is evidence that the use of ICT in the Highlands in the field of further education is much stronger than in other areas: in 2005, a study found that "currently the University of the Highlands and Islands do as much videoconferencing as all the rest of the universities in the UK put together" (Rennie & Mason, 2005). Also, take-up of courses offered by the Open University (a national distance-learning institution) is particularly high in the Highlands (Price et al., 2002).

Demography: The population of Highland was over 219,000 people in 2008. The population is ageing: the number of people aged 65 and over currently varies between 25% and 12% (Highland Council, 2009a). This age structure is attributed, on one hand, to a trend of retirement to rural areas by people who can afford to buy property and, on the other, the outmigration of young people in search for higher education and employment opportunities (The Royal Society of Edinburgh, 2008). Even though the region is considered to be family-friendly, there are real concerns about poor job availability, low wage levels and a lack of career progression opportunities among young people. In addition, opportunities for higher and further education are considered to be inadequate. Finally, a lack of access to necessities such as housing and transport also work as drivers of migration (Highlands and Islands Enterprise, 2009).

The Highlands are doubtlessly "attractive". One indicator is the large number of houses being acquired by incomers, whether as a second home or as a new home by someone recently retired (or, of course, by those who want to come to work). For example, average house prices in the Highland Council area rose by 134% between 2000 and 2005, from £ 59,796 to £ 140,041 (The Royal Society of Edinburgh, 2008).

Renewable energies: The Highland Council area is extremely well placed for the development of renewable energy initiatives using wind, water, tidal current, and wave power –all of them relying directly on geographic specificities. Potential for *hydropower* is not yet fully exploited in the Highlands. Scotland is also among the top locations *for marine energy*,

with around 25% of Europe's tidal stream resource and 10% of its wave resource (Forum for Renewable Energy Development in Scotland, 2009). This is because west-facing sites generally have the greatest wave energy resource, as the prevailing wind direction and the area of greatest fetch are westerly. The level of *wind* resource in the Highlands is amongst the best in the world, with wind speeds averaging nearly 8.5 m/s annually for most good sites (Highland Council, 2006). Offshore wind turbines also profit from high wind speeds.



A frequently-cited *obstacle* to the adequate exploitation of these resources is the lack of capacity in the national grid: grid capacity is very limited in North and North-West Scotland, where much of the offshore potential (wave, tidal, wind) is located. This is mainly due to the distance to major industrial centres and cities where the demand is greatest. A risk exists that the development of the grid will not proceed as quickly as the development of energy sources (OWIG, 2010; The Royal Society of Edinburgh, 2008; Forum for Renewable Energy Development in Scotland, 2009; Nick Forrest Associates Ltd, The Scottish Institute of Sustainable Technology (SISTech), Black & Veatch Ltd, 2008).

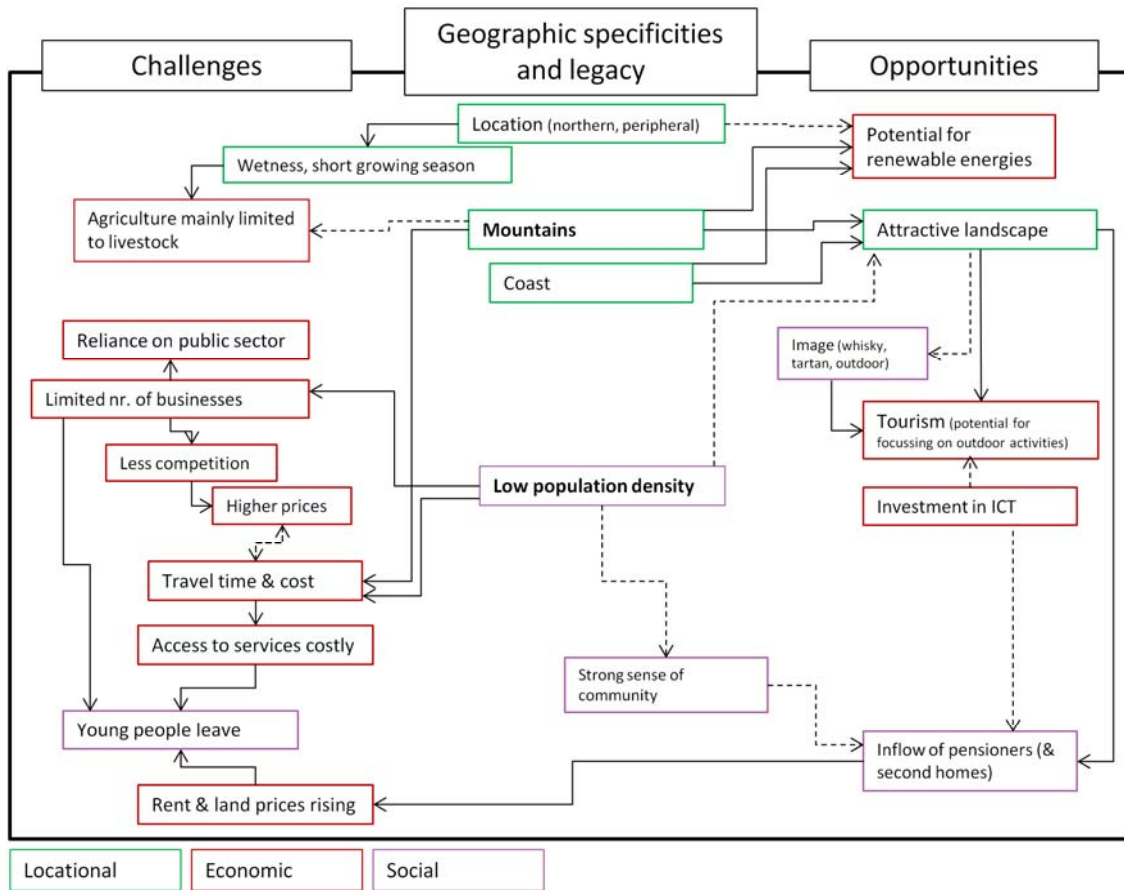
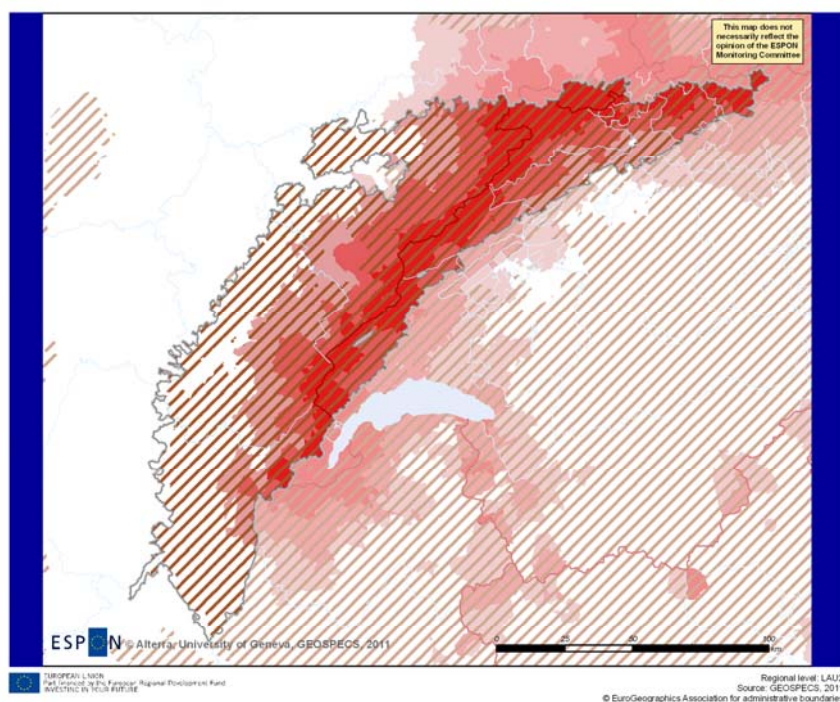


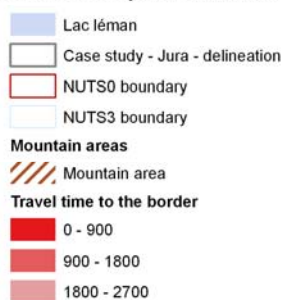
Figure 38 Nexus model: Highland, Scotland

Jura massif

The Jura is a middle mountain range (the highest peak reaches 1,720 m) on the border between France and Switzerland. Therefore its limitations (e.g. in terms of access to services or transport infrastructure) are less pronounced than in high mountain areas.



GEOSPECS specificities areas



Map 57 Jura massif

Compared to other European mountain areas, the Jura massif has an uncharacteristically high proportion of employment in industry (and a comparatively lower importance of the tourism sector). This is what makes the area successful (if success is measured by low unemployment rates and high incomes). Historically, the emergence of the watchmaking

sector is indirectly linked to the mountains: in the 19th century, the difficult conditions of farming in a mountain area and in a harsh climate meant that many farmers in the Jura were looking to supplement their meagre incomes in the winter months – this offer perfectly met the needs of watchmakers who were looking for manufacturers of parts and pieces.

Ligier (1999) characterized the Jura as being constantly “between” or “next to” something: next to the Alps, between France and Switzerland, between several metropolises. This feeling of being “in between” – or on the flipside, “on the periphery of” something – is definitely symptomatic. During interviews with stakeholders from the area, an impression emerged that the Jura’s position on the border is a more defining feature for the people of the area than the mountainous terrain – although the same language (French) is spoken in both parts of the Jura. Even though the economic “fabric” throughout the entire Jura is relatively homogenous (a comparatively high proportion of employment in the industrial sector, know-how in microtechnology and related activities such as watchmaking, machine construction, etc), the Swiss part of the Jura is home to more companies, and thus offers more jobs, higher wages, etc. For this reason, a significant flow of cross-border workers towards Switzerland has emerged: many well-educated French residents regularly commute over the border to work in Swiss companies. The opposite flow is made up of consumers – profiting from their higher purchasing power due to higher wages and to the CHF-EUR exchange rate. One stakeholder went as far as stating “the French come to work in Switzerland, the Swiss come to consume in France”.

In order to foster cross-border cooperation, the *Conférence TransJurassienne* (CTJ) was formed in 1985. It unites the *Conseil régional de Franche-Comté*, the *Préfecture de Région Franche-Comté* and the Swiss cantons of Berne, Vaud, Neuchâtel and Jura.

Economic structure: The Jura Arc has historically been very industrial –the main occupation from the 19th century was watchmaking, but nowadays more generally the fields of engineering / mechanics / microtechnology. On the French side, one-third of employees were working in the industrial sector in 2003, as compared to the national (i.e. French) average of 18% (Commissariat à l’Aménagement du Massif du Jura, 2006). In the Swiss Jura Arc, the watch industry accounted for about 10% of regional employment in 2005 – in comparison, the hotel business only employed about 1% (Kebir and Crevoisier, 2008).

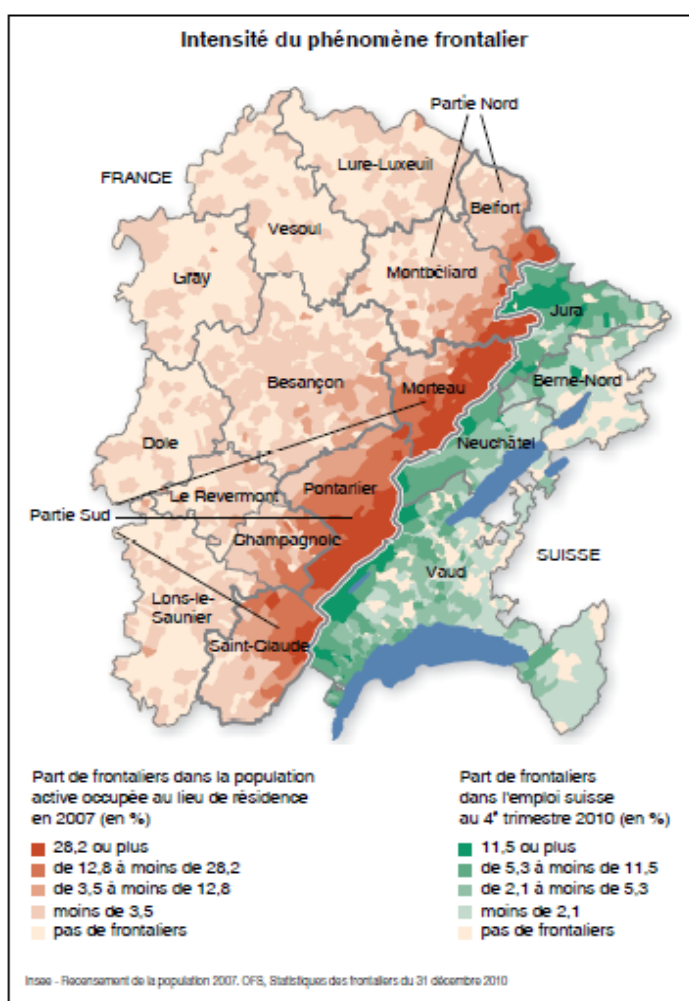
Several factors have contributed to this situation. Firstly, alternatives are limited: for example, agriculture is not possible to the extent that it would be in non-mountainous areas. The “usable agricultural area” in the French Jura takes up 35% of the surface, compared to the French average of 43.6% (Commissariat à l’Aménagement du Massif du Jura, 2006). A harsh

climate and infertile soils limit high-elevation land use to forestry and pastoralism (Breitenmoser et al., 2007). Historically, the long cold winters, during which snow limited travel and made field work impossible, led to an availability of a labour force in those months: farmers tried to find a second income, and watchmaking was an obvious choice. Watchmaking know-how had come to the Jura Mountains as early as the 1750s with the Catholics who fled from religious intolerance under the Swiss Calvinists in Geneva. From then on, the know-how spread relatively evenly in the entire massif, until the Swiss gained an advantage at the end of the 19th century, when they were first to realize that the time of automatisisation had come (Moine, 2003). Since then, a situation evolved in which employment opportunities concentrate on the Swiss side of the Jura where watchmaking benefits from a distinct quality image, whereas there are a number of businesses in the watchmaking industry on the French side, but these are more limited to subcontracting activities.

The industrial structures on both sides of the border are similar. However, there are important differences between the two countries. For instance, the business tax is between 66% and 93% higher for companies established in France than for companies established in Switzerland (Mission Parlementaire sur la Politique Transfrontalière, 2010).

Overall, Switzerland has a Total Tax Rate of 30.1% - compared to France with a rate of 65.8% (World Bank Group & PwC, 2011).

The most formative link between the two sides of the border is the workforce: the flow of cross-border workers shows a compatibility of



Cross-border workers; Map taken from: OSTAJ, 2011

supply and demand on both across the border. However, these flows are very much in one direction: from France to Switzerland. The high net incomes in Switzerland attract many qualified French workers, so that the French side of the massif is confronted with a lack of qualified workers in certain sectors (Commissariat à l'aménagement du Massif du Jura, 2006).

In 2009, 30,800 cross-border commuters had a job in the Swiss part of the Arc Jurassien. This is equivalent to a doubling of numbers within over a decade (OSTAJ, 2010).

While the flow of workers is directed from France to Switzerland, a different flow works the other way around: that of consumers. Due to the exchange rate between the Swiss Franc and the Euro – and the value of the Franc has significantly increased in recent months – people working in Switzerland profit from a higher purchasing power. Many Swiss residents living close to the border do their shopping on the French side – where commerce is thriving as a result.

Transport: The Jura is spread between two main development axes, along which the population is concentrated:

- The "Rhine-Rhone" axis: Basel, Mulhouse, Belfort, Montbéliard, Besancon, Dole
- The "métropole lémanique": Lausanne, Geneva, Annemasse, Thonon, Evian, Annecy

Between these two axes, the Jura massif constitutes a geographic barrier that hinders exchange. The main railway lines and roads run parallel to the massif. The frontier region is not very permeable even though the mountains are not very high (Programme opérationnel INTERREG IV France-Suisse, 2007). The topography makes road construction more costly (for example by necessitating more engineering constructions such as bridges and tunnels) (Brasey-Duthe, 2011), but the main obstacle is the *lack of population density*: as the massif is not strongly urbanized, it is not worthwhile having too many connections (Loesener, 2011).

Nevertheless, the accessibility of the massif is satisfactory: no point is more than 45 minutes away from a highway on-ramp, which allows quick connections to surrounding agglomerations (Commissariat à l'Aménagement du Massif du Jura, 2006). Therefore, an improvement of the transport network does not emerge as a major priority for the massif. One stakeholder questions whether a highway (for example) would really improve the lives of the people in the Jura or serve to attract companies – seeing that other factors (such as fiscal policy or a qualified workforce) play a much more important role in the location decisions of companies (Marmier, 2011).

Identity: Ligier, in an extensive description of the identity of the Jura, comes to the conclusion that it suffers from an "inferiority complex" and an "almost unhealthy modesty" – even though the Jura does not lack

assets (from its strategic position in the middle of Europe to its industrial specificities). He traces this underlying feeling back to the Jura's permanent description as being situated "between" or "next to" something: between Switzerland and France, between Rhine and Rhône, between the four metropolises Lyon and Strasbourg, Geneva and Zurich – and, of course, next to the Alps (Ligier, 1999).

A view "from the outside" seems to reveal a relatively homogenous identity. Even though Switzerland has external frontiers to the EU, it is part of the Schengen area, and the border territory between French-speaking Switzerland (La Suisse romande) and France share many common characteristics. This situation is due not only to the large flows of cross-border workers, but also to similar socio-economic and environmental problems. The linguistic unity of the territory is an undeniable factor of cultural unity (Programme Opérationnel INTERREG IV France-Suisse, 2007). The common tradition of watchmaking (and nowadays microtechnology) is also characteristic on both sides of the Jura massif. Worldwide, magazines advertise mechanical watches "made in Switzerland". Even though competitors (from countries such as Japan) try to penetrate the same market, they have not succeeded. In the minds of the consumer, quality watches remain associated with a country – Switzerland – and with certain regions – in particular Geneva and the Swiss Jura (Kebir and Crevoisier, 2008).

Nevertheless, considering both sides of the Jura together, the impression emerges that it would be too optimistic, to speak of a "common identity". One stakeholder compared the Jura to Québec: Even though both areas speak the same language, the countries are different – in their accent, in their history, in their political-administrative setup (Sage, 2011). Another acknowledges that each side of the Jura massif has evolved in its own way, especially after the Second World War, and that "competition" is often mentioned as a catchword when talking to people from the area (e.g. competition for trained personnel, for companies). The *Conférence Transjurassienne* (CTJ) is an important factor in the efforts to "reweave the bonds", but this takes time, and above all, trust (Loesener, 2011).

Natural resources: The Jura massif has ideal conditions for forests: a cool and humid climate, good geological characteristics but only moderate altitudes, which leads to solid and homogenous timber. In the Swiss Jura, 48% of territory is forested – compared to the Swiss average of 30% (OFEV, 2010). In the French Jura, 43% of area is forested - compared to the French average of 28% (Commissariat à l'aménagement du Massif du Jura, 2006). There is even an initiative to attain an AOC label for coniferous wood from the Jura – claiming that this wood deserves a quality label due to its extraordinary robustness. The label would apply equally to wood from the French and Swiss Jura (www.aocboisdujura.ch).

Forests could even be regarded as part of the identity of the Jura massif: a particularly typical landscape is the “pâturage boisé” (“forested grazing land” – in France the term “pré-bois” is more frequent). It is part of the culture and heritage of the area, and has even been called the “emblem” of the Jura Arc (Magnollay, 2011). On the one hand, this half-open landscape offers a home to a diversified flora and fauna; on the other hand, it has been perceived as an “attractive” landscape, thereby indirectly benefiting the tourism industry (Conférence Transjurassienne, 2008). However, this is a cultural landscape which requires continued human management. These landscapes are threatened in many areas: the less productive grazing areas are being abandoned and thus becoming overgrown with bushes, whereas the more productive areas (especially close to farms) are used more intensely for dairy cows.



Image taken from: Conférence Transjurassienne, 2008

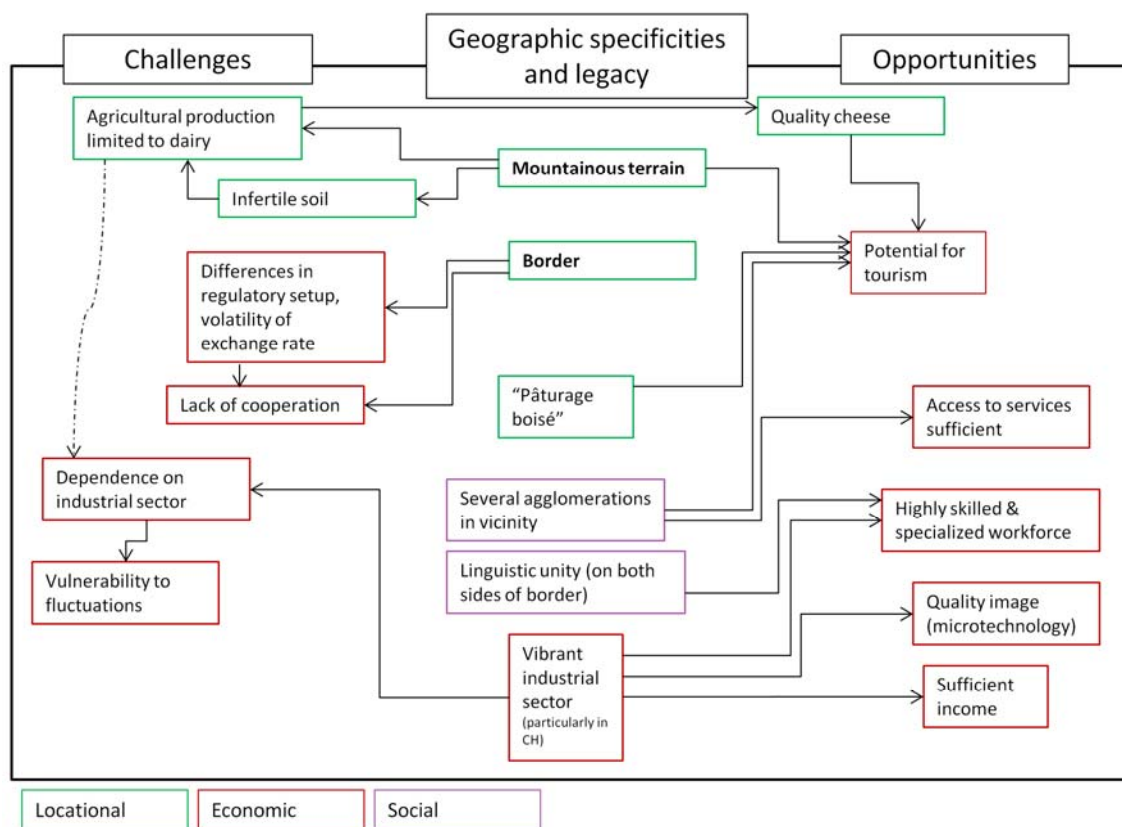


Figure 39 Nexus model: Jura massif

5.2.2. Islands: Case study reports

Sicily

Description of the case study area and its geographical specificity

The Italian region of Sicily consists of one large island, Sicily, and a cluster of smaller islands including Mozia, the Stagnone Lagoon, Pantelleria, Ustica, the Aeolian Islands, the Pelagian Islands and the Egadi Islands. The region size totals an area of 25,711km², with a population of just over 5 million, and a population density of 196.4 persons/km². Sicily is found at the South-western periphery of Italy and is separated from mainland Italy through the Strait of Messina, which is about 3km wide at the north of the island, and 16km wide at the southern end of the island. The island of Sicily is characterised by a hilly landscape.

Most residential and tourism related settlements are based in coastal areas while the agricultural industry is concentrated in the centre. Sicily, and the smaller islands, are characterised by highly active volcanoes which also serve to enrich the soil on the islands.

Islands are faced by both challenges and opportunities for economic and social development. Its geographic characteristic, i.e. it being surrounded by sea, is not the sole feature that distinguishes an island from other territories. In fact, several behavioural traits also add to their uniqueness with the term "*insularity*" encompassing these more fully. "*Insularity*" is therefore used to define the broader and more encompassing characteristics of "*islandness*" and is understood to imply that the following three conditions are met:

In the main part surrounded by the sea;

- Dependent on centres of economic, social and cultural activity outside the territory;
- Peripheral in relation to the main centre of economic, social and cultural activity.

The interaction of these three conditions, which often accentuates the permanent and severe handicaps which islands face, will be considered when assessing how the economic, social and environmental structure and trends of Sicily have been affected by the islands' insularity. Desk research was supplemented by field work in the preparation of this case study with a questionnaire being sent out to a number of stakeholders.

Economic, Social and Environmental processes related to the geographic specificity

The extent to which islands are affected by their geographic specificity depends on their degree of insularity. Sicily's relatively large size may have mitigated the negative effects resulting from its "islandness" characteristic although the other aspects of insularity still prevail and have had an impact on its development. In addition, a number of these challenges are shared with the entire South of Italy. Although not an island, and therefore not surrounded by sea, Southern Italy also exhibits signs and consequences of peripherality as well as dependence on the centre of Italy. Of course the third dimension of insularity, solely present in islands, adds another dimension to their development challenges making this somewhat different to other southern regions on the mainland.

Due to its islandness and location at the centre of the Mediterranean, Sicily has had a turbulent history which involved a number of conquests by foreign empires. This has led to the islanders having had little control over their destiny and having always depended on an external centre of economic influence and power. The Italian unification in 1861 was met with great resistance by Sicilians who considered it a form of occupation and exploitation. This has had deep repercussions on the way Sicily interacts with the main centre of governance in Italy and may have led to the emergence of the Mafia as a way of social organisation. According to Prof. Salvatore Lupo, the consequential inability of central government to control Sicily has led to an informal relationship between the official power structures in Rome and the underground economy in Sicily.¹²⁷ This turbulent history has affected the psyche of the islanders who feel a very strong link to the Sicilian identity whilst feeling separated from the rest of the country and continent. Notwithstanding this cultural detachment, Sicily has always depended on others for economic support.

This dependence on the rest of the country manifests itself in a higher than average public sector employment in Sicily. The Sicilian economy is in fact characterised by a predominance of the service sector – 33.2% as against a national value of 20.6% - and a low presence of industry. This may be linked to the island's insularity, whereby the detachment from mainland has led to an insular mind-set, making people more risk averse and unwilling to set up new enterprises. In addition, a detached local government has led to transport inefficiencies and a higher cost of doing business. The creation of a fixed link through the Strait of Messina would improve accessibility. However, the project faces opposition by those who feel that the beauty of the landscape will be jeopardised and ecological damage to the area will ensue.

¹²⁷ <http://www.h-net.org/reviews/showrev.php?id=29352>

The existing obstacles in setting up one's business lead to a higher rate of unemployment in the region and the relatively large number of emigrants in search for better job opportunities in the north of Italy. Those who choose to remain in Sicily do so either to work in a pre-existing family business, also reflecting the strong family ties that are still predominant, or because no opportunities to do so come their way particularly due to a low educational background.

Other strong sectors when compared to Italy's average include agriculture and fishery. Their current strength is also directly related to its islandness, which has resulted in a stronger attachment to historically important traditions such as fishing and farming. The Sicilians have taken advantage of their inherited assets in agriculture and have expanded to organic and agri-tourism markets. Tourism is undoubtedly also a very important sector. This, together with transport and communication, amounts to approximately 23% of Sicily's GVA with the smaller islands depending disproportionately more on the Tourism Industry as they are strongly linked with being a sun and sea destination due to their geographical location and islandness.¹²⁸ This often leads to seasonality of employment that is typical of island economies. Unfortunately it has also resulted in strong environmental pressure on sensitive coastal areas, including the common disregard of protected areas. Ironically, however, environmental preservation appears to be the main reason put forward against the development of renewable energy plants for which great potential exists in Sicily.

Development opportunities and challenges

The research into Sicily as a case study has resulted in five nexus models being developed. The historical legacies inherited by the Sicilians, due to insularity characteristics, have resulted in a number of development opportunities and challenges which interact with each other to influence the social and economic realities of the islands. These are briefly described below.

¹²⁸ SMILIES – Small Mediterranean Insular Light Industries Enhancement & Support; 'Local Studies Sicily', Project co-financed by ERDF; URL: http://www.regione.sicilia.it/cooperazione/print/doc/Sicily_Local_study.pdf

1. Detached Governance

Sicily has been exposed to a turbulent history which is characterised by the domination of different empires and a struggle for self-governance. This colonial dependency may be mirrored in the inclusion of the islands into Italy as a whole country. These realities have resulted in Sicily experiencing a significant physical distance from the centre of governance. The importance of the physical distance to this centre is superseded by the peripherality and dependence that Sicilians perceive in the governance structure. The effect of this situation is a diminished sense of ownership of the islands that is felt by the islanders. The perceived ineffectiveness of local government on the islands has contributed to the underground governance structures that have emerged as an alternative and more effective way of organising the region. The ineffectiveness of regional government to adequately invest in sufficient infrastructural projects has led to problems with the rail and road networks. These two elements combined have led to high costs of doing business which has led to high and volatile levels of unemployment.

Detached governance can also bring about low levels of interest in environmental preservation and low incentives to invest in projects with a long-term benefit to the region. "External" initiatives are also viewed with great suspicion due to the insular mind-set cultivated by this peripherality and dependence, and which has been amplified by schemes such as the "Fund for the South". Within this, there may be the opportunity to cultivate increased ownership through fiscal federalism.

2. Idyllic Image

The fact that islands are surrounded by the sea, and therefore detached from the landmass, seems to translate in a mental detachment from everyday life. Sicily has strong associations with an idyllic image of peace, tranquillity and a more old-fashioned way of life. Its location in the Mediterranean Sea and climatic conditions further contribute to this 'paradise on earth' image. This image has been well exploited by Sicily in terms of the tourism industry, where sun and sea tourism plays a central part. It has also served as an attraction to residents to remain on the islands and for new residents to migrate to Sicily. This image has also served to attract individuals with an artistic flair; writers, poets and artists have found the islands an ideal place to allow their creative minds to wander.

This image can, however, serve as a barrier to island development. The image of paradise often hides the underlying suffering that islanders may have to bear, inhibiting the understanding of the true development challenges of islands by policy makers. The reality that visitors encounter during their holidays on the islands does not mirror everyday life for residents. The opportunities that are yet to be fully exploited in this regards are refocusing the image to include centres for creativity on the islands through rebranding exercises, development of niche industries and the establishment of scholarships in the arts.

3. Migration Crossroads

Sicily, like other Mediterranean islands, has been at the crossroads of many civilisations due to their insularity and the inability to remain autonomous. Net immigration into Sicily is positive; however this disguises the large amounts of young male Sicilians leaving the islands to seek employment on the Italian mainland. This is due to the large influx of immigrants from Eastern Europe and North Africa. While trickles of migrants pose little pressure on social structures and have been able to integrate in the past, large numbers such as those registered in recent years, can be overwhelming as they instigate an unwelcome speed of change.

The opportunities brought about by this historic legacy are that, apart from amplifying the labour force, migrants may enhance the thought process on the islands. Often, great innovation is instigated by fusing traditional experience and knowledge with new ideas and attitudes. If exploited correctly this brings with it substantial innovation opportunities, including in governance approaches, particularly if a selective approach is adopted to attract the human capital. This can contribute to an effective renewal and enhancement of the social fabric.

4. Coastal Settlements

As a result of being an island community with strong ties to the sea, as well as the mountainous characteristics of the islands, Sicily is largely characterised by coastal settlements. The limitations that such a legacy imposes include the strong environmental pressure on sensitive coastal areas, which risk being ruined forever in the absence of appropriate intervention. In addition, the mountains themselves may act as a barrier to social and economic interaction between different localities in Sicily, actively dividing areas of land from each other. The sea acts, in a similar way, as a barrier to further development outwards. These characteristics

can be better exploited, and their limitations better managed, with stronger and better-focused governance which aims more directly at concrete sustainable development goals.

5. Legacy of Dependence and Exploitation

Historically, Sicily has been viewed as a suitable area for exploitation and use. This can still be seen today with the location of a high proportion of power plants on the island that service economic activity on the mainland. Since the companies are owned by national enterprises, there is no real revenue benefit from locating the plants in Sicily, except for an impact on jobs which is mitigated (in whole or in part) by the environmental repercussions. This feeds into the low sense of ownership of the islands, where Sicilians feel that their destiny is not really in their hands and their land is not theirs to administer. This fuels the low level of entrepreneurship as people are unwilling to risk capital without a sense of security. This lack of ownership also leads to a low level of respect for natural and cultural assets. This is out of sync with the strong sense of identity that the Sicilians feel as a region, which seems stemmed in the dependence cycle.

Generalisations from the case study

Sicily is a particular case study for islands, being the largest island in the Mediterranean and having its own mass of economic and social activity, which pushes it to the very end of the spectrum of insularity. However, from the analysis above we can still see that Sicily faces some challenges arising from its insularity.

Another strong issue that arose from this study, which is shared by many islands that are not island states, is the feeling of peripherality to the centre of governance. Feeling detached from the main decision-making body leaves islanders feeling powerless to influence their own future and often results in a lack of ownership of the official system of governance. Sicily is an extreme case in point where this led to the creation of a large underground system of governance. While this is one of the observations that is specific to the area, the process which contributed to this is by no means unique to Sicily.

The sensitivity of environmental assets on islands is highlighted in this case study, but is a problem shared by many islands. The limited natural resources usually lead to heavy exploitation of the few assets that islands do have – often in order to boost their tourism industry. The triumph of economic needs over environmental ones is clear in Sicily, although

efforts are being made to reverse the trend. The constant battle for finding a sustainable route to development is tricky for islands and is amplified by the delicate ecosystems that are generally nurtured by the detachment from the mainland. The case of Sicily in particular shows the implications of a mountainous central territory with a consequent pressure for economic activity concentrating on the environmentally vulnerable coastal areas. This issue detracts from the benefits which a relatively large landmass can convey to an island.

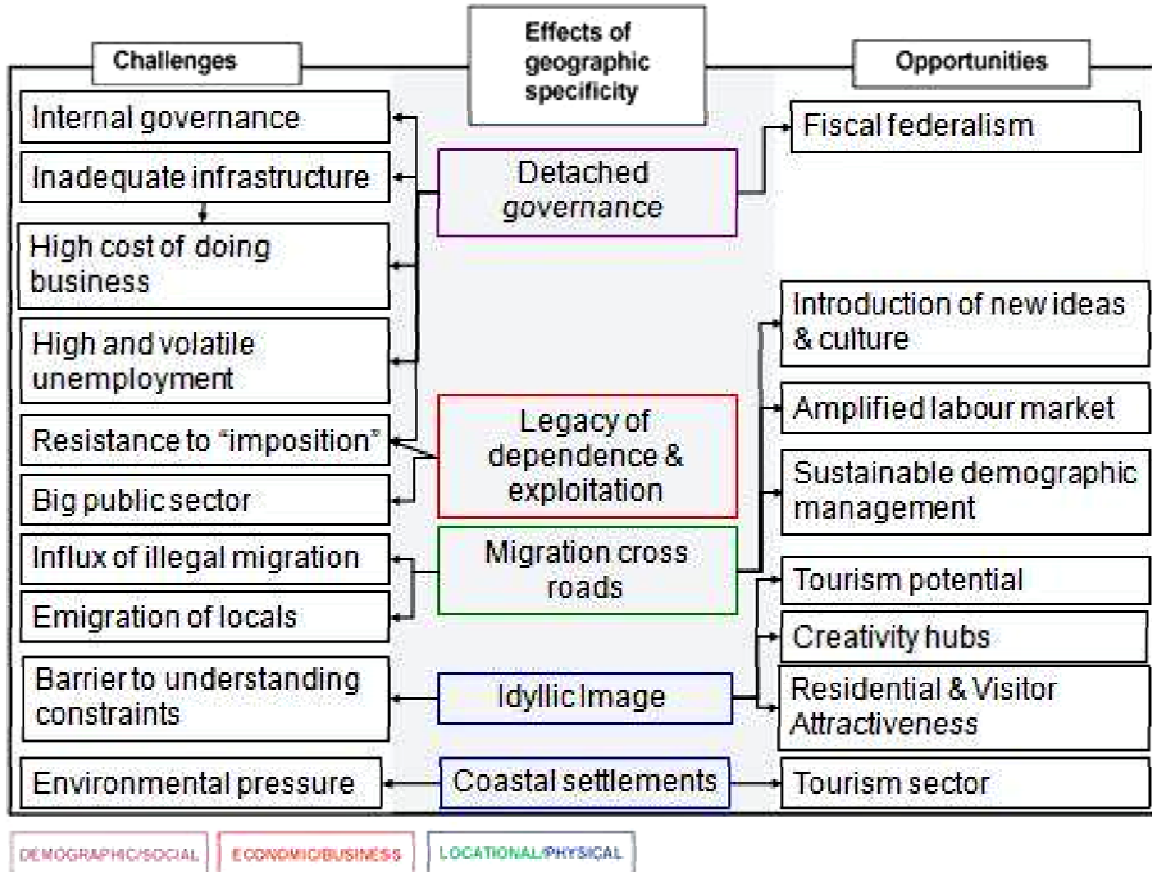
The large emigration outflow of the native population is also a challenge that many islands face. The restrictions in education and employment opportunities, and the inability to commute to mainland on a daily basis, due to the unavailability of reliable and swift links, means that islanders often need to move away from their towns of origin in order to pursue their education or careers. This problem is present to some degree on all islands.

The physical detachment from mainland is a characteristic that all islands share, with this detachment often being reflected in the psychological make-up of islanders and an inward-looking mentality. While the thirst for improvement is strong on islands, the feeling of separation between 'us' and 'them' is predominant resulting in a sense of 'we know best' about the optimal development paths¹²⁹. There are also strong barriers to change on islands, particularly those brought about by "external" sources, as the inherited characteristics are seen almost as a scar to be worn with pride. This idea is reiterated by Sociology Professor Manuel Castells who describes this phenomenon as a 'resistance-based' identity.¹³⁰ This is one of the reasons why changes, such as the introduction of a fixed link to mainland, are often met with rejection by islanders, who are torn between the wish to reduce connection time and improve economic prospects on the islands and the longing to retain their separation.

¹²⁹ RASMUSSEN J., 'Islands: Centres hubs, spheres and ... - metaphysical islandscapes in social theory'; URL: http://www.keg.lu.se/IGUislands/J_Rasmussen_paper_draft.pdf

¹³⁰ CASTELLS M. (2006), 'Globalisation and Identity: A Comparative Perspective', Barcelona; URL: http://www.llull.cat/rec_transfer/webt1/transfer01_foc01.pdf

Figure 40



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*Descript
ion of the case study area and its geographical specificity*

The Outer Hebrides are found at the westernmost periphery of Europe, located about 70 kilometres west of mainland Scotland and stretch for 130 miles. They overlook the Atlantic Ocean and comprise a chain of more than 100 islands and small skerries with a total of 15 inhabited islands. The Outer Hebrides have an area of approximately 3000 square kilometres, a population of approximately 26,500 and enjoy a cool temperate climate.¹³¹

Islands, such as the Outer Hebrides, constitute one type of geographic specificity that is understood to create both challenges and opportunities for economic and social development. Although the geographic characteristic, i.e. it being surrounded by sea, is one feature that distinguishes an island from other territories, there are other traits that add to the uniqueness of these areas, with the term "insularity" encompassing these more fully.

¹³¹ <http://en.wikipedia.org/wiki/Hebrides>; http://en.wikipedia.org/wiki/History_of_the_Outer_Hebrides

For the purpose of this case study, “insularity” is understood to imply the following three conditions:

In the main part surrounded by the sea;

Dependent on centres of economic, social and cultural activity outside the territory;

Peripheral in relation to the main centre of economic, social and cultural activity.

It is the interaction of these three conditions that will be considered when analysing how the economic, social and environmental structure and trends of the Outer Hebrides have been affected by the Islands’ insularity. The distance from and dependence on centres of economic, social and cultural activities outside the islands’ territory often amplify the permanent and severe handicaps that result from the regions being physically cut off from mainland. These difficulties are even greater for the smaller islands within an archipelago that are faced with the problem of “double insularity”. Desk research was supplemented by field work in the preparation of this case study with a questionnaire being sent out to a number of stakeholders.

Economic, Social and Environmental processes related to the geographic specificity

The dependence of the Outer Hebrides on centres of economic activity outside its territory and its peripherality from these centres, implies that economic activity is limited, with a large proportion of locals employed in the public sector. Those employed in the private sector work in very small enterprises with a great incidence of people employed in their family business. In addition, the peripherality of the Outer Hebrides results in a lot of activity being characterised by sporadic demand and seasonality of employment. This results in the need for people to invest in their education and skills in order for them to be employable all year round.

The desire to invest in one’s education is the main cause reported for outward migration from the Islands, particularly affecting the younger age cohort¹³². In addition, the remote islands’ status, limited employment opportunities on the Islands as well as the predominantly rural nature of its communities have also explained this population decline as being

¹³² HALL AITKEN (2007) *Outer Hebrides migration study*, for Comhairle nan Eilean Siar, Western Isles Enterprise and Communities Scotland; URL: <http://www.cne-siar.gov.uk/factfile/population/documents/OHMSStudy.pdf>

inextricably linked to the area's geographic challenges¹³³. This has led to the Outer Hebrides experiencing the biggest population decline of any Scottish local area over the last decade. Some of those who migrate choose to return to the Outer Hebrides in their older age as a result of the strong sense of identity and belonging to the islands. This strong community spirit, a perceived safe environment, and preserved traditions are all benefits attributable to the first characteristic of insularity, i.e. surrounded by the sea. The limited influence from the "outside world" has allowed this region to retain traditions that are considered to be a heritage to locals including the widespread use of Gaelic.

The persistence of this emigration has led to the Outer Hebrides having one of the lowest population densities, at 8.5 persons/km², of all Scottish health boards¹³⁴. In addition, approximately 78.9% of the Outer Hebrides population live in areas classified as very remote-rural compared to 3.0% in Scotland as a whole. Such remoteness and sparsity factors present challenges for community development. As a result, problems of inadequacy of goods and services provision exist. In fact, more than three quarters of the population of the Outer Hebrides are classed as living in 'access deprived' areas compared to 15% in Scotland as a whole, as measured by the SIMD geographic accessibility domain.

Recent migratory patterns have also lead to increases in costs per capita. The cost of health services, for instance, is substantially higher than on mainland Scotland. Certain segments of the population need to travel long distances to be given adequate care and in many cases need to be taken to a hospital on mainland since the number of interventions offered are limited. In addition, outward migration has led to a number of schools closing down since smaller numbers are enrolled each year. ICT has been used to reduce this dependence by providing tele-health as well as distance learning courses, although broadband connectivity is still relatively weak in certain areas. Dependence on ICT also seems to be creating a social divide with people who are not computer literate feeling marginalised. Transport infrastructure within the island is also considered inadequate, entailing a greater use of private transportation. This again results in social exclusion, particularly with respect to the elderly and disabled people, who may have no other means of mobility.

¹³³ http://www.ohcpp.org.uk/Single_Outcome_Agreement.pdf

¹³⁴ The Scottish average is 65.2 persons/km²; Source: THE OUTER HEBRIDES COMMUNITY PLANNING PARTNERSHIP (2009) *Forward Together, Single Outcome Agreement 2009-2010*; URL: http://www.ohcpp.org.uk/Single_Outcome_Agreement.pdf

The rise in international oil prices is increasing energy costs for the Outer Hebrides particularly given their dependence on imported oil¹³⁵. This led them to investigate avenues for investment in renewable energy sources, although the strong sense of environmental preservation may limit this potential. The Outer Hebrides is home to a vast number of protected areas, although locals believe such protection to be not necessary given the culture of Hebrideans that favours environmental protection without necessitating regulation. In fact the feeling of imposition from external sources is expressed by most locals.¹³⁶

Development opportunities and challenges

Five nexus models, delineating both limitations and opportunities stemming from the insularity of the Outer Hebrides, have emerged from this case study as described hereunder.

1. High cost of doing business

The geographical distance from customers, certain material inputs, as well as employment and knowledge hubs all explain this inherent disadvantage. The high cost of doing business mainly reflects greater transport costs, problems concerning transport reliability, low access to resources, as well as a small market size which limits the possibility to generate economic activity solely to service the local economy and that necessarily implies the need to incur further costs to export a substantial part of the produce. The limitations to economic development that stem from this historical legacy include a relatively higher rate of unemployment on the Outer Hebrides when compared to the national and regional average¹³⁷¹³⁸, a relatively larger number of people working in the public sector as a result of low private sector activity that relies strongly on local services and small scale tourism¹³⁹, a duplication of public sector activities due to its distance from the centre of governance and service provision, insufficient diversification of the economic base that makes the Islands more vulnerable to economic shocks, as well as one reason explaining the current migration outflow in search for better job opportunities.

¹³⁵ Economic and Community Benefit Study – Scottish Government/ Halcrow Group Limited – January 2009

¹³⁶ GEOSPECS field research

¹³⁷ <http://www.scotland.gov.uk/Resource/Doc/187960/0052049.pdf>

¹³⁸ <http://www.cne-siar.gov.uk/factfile/labourmarket/unemployment.asp>

¹³⁹ Hall Aitken and Ionad Nàiseantanah-Imrich (2007), *Outer Hebrides Migration Study Final Report*

2. Small tight-knit communities

Small tight-knit communities tend to be inward-looking, which can result in a loss of development opportunities due to limited interaction with mainland. The smallness of the community and population size results in the absence of critical mass and the likelihood of atypical employment opportunities¹⁴⁰. This may also stimulate migration outflows which would curtail demographic regeneration. Social problems, including drinking problems, have also been assigned to islands mainly due to the perception of isolation, as well as the idea that tight-knit communities often lead to intrusion and social claustrophobia – a phenomenon mainly raised by the younger generations.

On a positive note, traditional economic activities, such as crofting, have proven to be successful due to a sharing culture that existed, and still exists today. This allowed residents to build a strong social support system that is also conducive to return migration. The small workforce has led to residents becoming more flexible so as to engage in different employment opportunities. ICT has helped locals “escape” from their small community in order to express themselves with relative anonymity. This “dependence” on ICT for economic and social activities provides great avenues for further development although it is important for authorities to ensure that people who are not able to make use of this technology do not feel, or effectively become, marginalised.

3. Emphasis on nurturing human capital

The Outer Hebrides places great emphasis on its human capital, particularly with respect to health and education. This leads to a large number of residents, particularly in the younger age bracket, migrating in order to better their education and employment prospects. Notwithstanding this, the nurturing environment that is said to exist is encouraging emigrants to return to their land of origin in their older age. ICT, which is used as a tool to improve education through distance-learning programmes, and health, through online consultations, is however creating a social divide since residents have unequal access and know-how.

The recent increase in house prices particularly when compared to the salaries offered on the Islands, may be putting pressure on house prices, which has also been highlighted as a reason for the outflow of migration of young couples. On the other hand, development opportunities are seen in

¹⁴⁰ This may include part-time employment, fixed-term contracts, temp agency workers, self employed and persons in flexible jobs

the possibility of attracting back to the Islands people who left for education or work reasons, with the knowledge and/or expertise gained off their shores that could spill-over to the rest of the community. Policy should, therefore, aim to address this challenge. Negative quality of life effects can be attributable to two aspects, namely (i) the higher proportion of female emigrants that contributes to population imbalance and an ageing population, (ii) the importance given to ICT that is also leading to an increased outflow of migration since locals are more aware of the opportunities available outside the Outer Hebrides. The latter, however, also serves to improve locals' quality of life since it allows them to benefit from improved specialist healthcare and online education.

4. *Strong identity*

The strong identity witnessed in the Outer Hebrides is reflected in the preservation of a number of traditions, including the use of the Gaelic language, as well as relatively strong religious ties. This has given rise to a number of development opportunities, particularly for the tourism industry to exploit this almost intact traditional heritage. In addition, the potential to exploit niche educational opportunities, given the widespread use of Gaelic, exists. The strong religious influence on the Hebridean community may have led to the good social ethic present to date, which in turn may have resulted in the quality of life assets that are said to exist, including a strong environmental preservation as well as low crime levels and drug use. However, locals as well as immigrants often complain that the strong community identity creates barriers to integration for those who choose to act differently from the mass.

The limitations posed by a strong community identity, which may result in an inward-looking society that is less susceptible to embracing change, has led to the creation of media stereotypes depicting a society with sociological problems and that are extremely close-minded as a result of their strong protestant adherence. This damaged the community's confidence which in turn has led to a fear of failure, particularly in the take-up of entrepreneurial activities. This is reflected in relatively low activity rates, although the Hebridean authorities have created a number of programmes aimed at encouraging entrepreneurial activity, particularly in the younger age cohort.

5. *Geographical location*

The geographical location of the Outer Hebrides, at the far western end of Europe, is in itself a historical legacy that is characterised by particular

climatic conditions, low development pressures as a result of its distance from mainland, as well as well-preserved natural areas and fish reserves. The main opportunities stem from the islands' environmental assets. The Outer Hebrides are also optimally located to take advantage of wind, wave and tidal energy. However, the feeling of exploitation in the development of alternative energy sources has resulted in locals opposing such development projects. In addition, the large number of protected areas gives rise to development restrictions with possible negative consequences on house prices. Structural development may, therefore, be constrained by conflict that appears to exist between environmental preservation and the possibility of developing renewable energy plants. The Outer Hebrides are also faced with limitations stemming from accessibility problems, for instance in the case of energy networks, that result in added costs to business and households alike. This accessibility problem is amplified for smaller islands that are faced with the problem of double insularity.

Generalisations from the case study

The extent to which islands are affected by their geographic specificity depends on their degree of insularity. As a result, only some of the findings that emerge from this case study can be applied to all islands.

Given the dependence of islands on centres of economic activity outside their territory and their peripherality from these centres, one can conclude that islands are, in most part, highly dependent on the public sector with a large proportion of their citizens employed in the civil service, including the military. Those employed in the private sector generally work in very small enterprises with a great incidence of people employed in their own family business. In addition, the peripherality of islands results in a considerable amount of activity characterised by sporadic demand and seasonality of employment. This is also true for tourism, a sector that employs a substantial number of people on most islands. This seasonality and sporadic demand encourages people to become multi-skilled so as to be employable all year round. In addition, most islands are perceived to be optimal locations for the development of renewable energy sources.

Accessibility problems are in most part common to all islands with strong dependence on a ferry service in the absence of fixed links. For islands in northern Europe, this service may prove to be unreliable in the winter months due to inclement weather. In addition, inter-island public transportation is generally of sub-standard level given the low population density on some islands, raising the difficulty and cost of servicing remote areas. This results in islanders being more dependent on their personal

means of transportation which results in two additional problems, namely (i) social exclusion of citizens that have no private vehicle or are not able to drive; (ii) high costs of transportation since fuel tends to be costlier on islands. Problems of inaccessibility, as well as a lack of critical mass, also result in islands facing higher costs for goods and services. Health provision, for instance, is often inadequate with most people having to be transported to mainland for most procedures. The same is true of education with a limited number of courses offered to citizens.

These reasons, among others, often result in a number of people choosing to leave islands. This creates problems of an ageing population given that people often choose to emigrate during working age and return in their old age for retirement purposes with obvious repercussions on the sustainability of pensions and health systems. The most attractive attributes of residing on islands, and those most likely to attract locals back to their hometown, is reported to be a strong tight-knit community, preserved traditions, as well as a safe environment and beautiful landscape. However, the closeness of the community may also be a factor driving locals away from the island given a feeling of intrusion and claustrophobia expressed by the younger cohorts.

The case study brought to light the fact that islanders often feel that decisions taken at the core are too distant from their reality and that their opinion is often disregarded. This policy "imposition" has often led to locals rejecting policy determined at the level of central government. Regional policy would allow islanders to feel "ownership" of the policy designed that may therefore lead to their more successful implementation. In addition, policy should also aim to reduce islands' dependence on mainland and not merely attempt to mitigate the "islandness" problem through accessibility concerns.

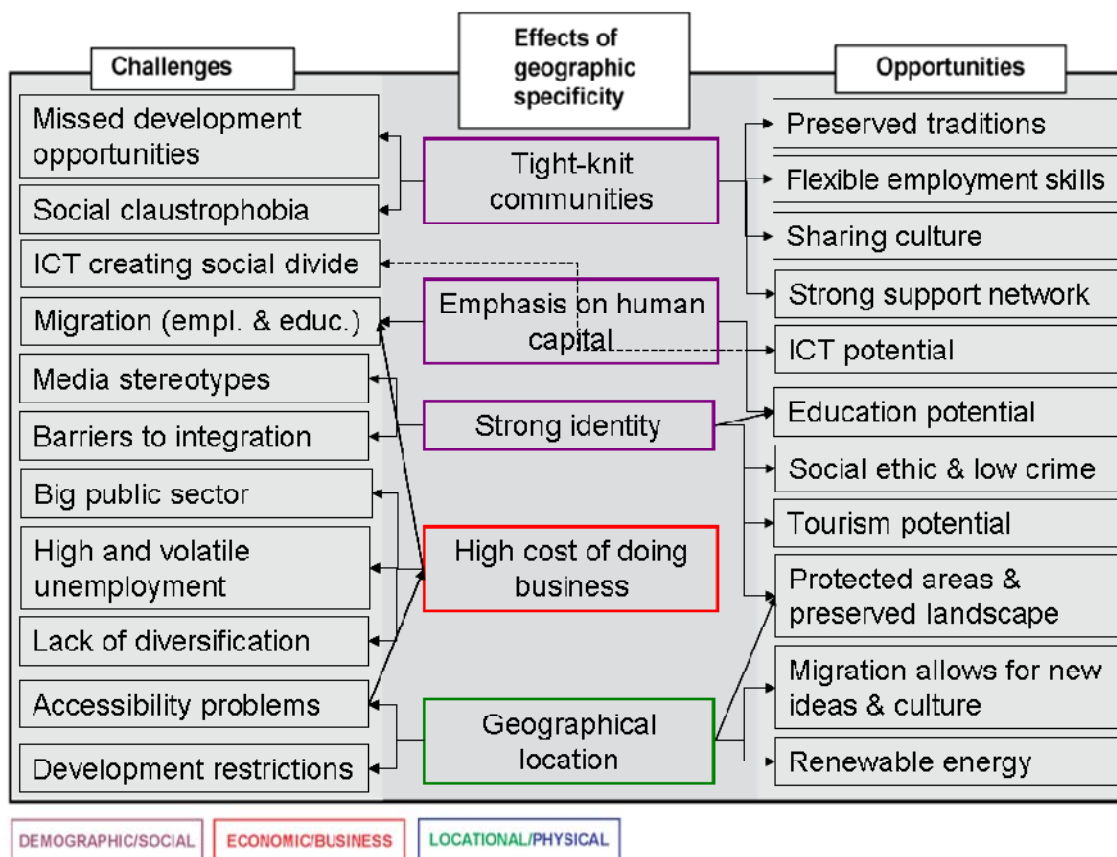


Figure 41 Outer Hebrides: nexus model

5.2.3. Sparsely populated areas: Case study reports

Torne Valley

The Torne Valley (Finnish: Tornionlaakso, Norwegian/Swedish: Tornedalen) is a cross-border region in one of the most sparsely populated areas of Northern Europe. It is named after the Torne River, which flows from the Scandes through the river valley and into the Gulf of Bothnia. Geographically, the municipalities/LAU2s of (from south to north) Haparanda, Övertorneå, Pajala and Kiruna in Sweden, and Tornio, Ylitornio, Pello, Kolari, Muonio and Enontekiö in Finland are the core region. Culturally and historically, the region can be expanded with the four Norwegian municipalities of Storfjord, Kåfjord, Kautokeino and Nordreisa, and the Swedish municipality of Gällivare. This case study refers to the *Torne Valley* as the expanded delineation of these 15 municipalities. The regional context of the Torne Valley has also institutional bases, as 14 of these municipalities (excluding Gällivare) form the border region of Tordendalsrådet/ Tornionlaakson neuvosto, one of the Nordic Council of Ministers Cross-Border Co-operation Committees.

The Torne Valley is characterised by geographic specificities of sparsity, mountains, coastal, municipalities with a significant island component, and border areas. About 114,000 people live in the region, resulting in an average population density of 1.5 people/km². Thus, it can be argued that sparsity is the main factor that has contributed to shaping the region's socio-economic development.

Socio-economic development

In 2010, economic development was relatively good; the increase in company turnover and employment, in particular, was faster than in many other regions in the countries, due to new activities, mostly related to mining or tourism. Even from the European point of view, the regional employment and unemployment rates are close to the average; compared to their respective national averages, both the unemployment rates and participation in various labour market measures are high.

The main sectors of employment are linked well to local assets. The natural resources provide opportunities for agricultural activities (mostly reindeer herding and fishing), forestry activities, and energy production (especially hydro-electricity). The unspoiled natural environment, with its unique geographic and cultural assets with Arctic elements, and preserved regional culture are important assets for tourism.

Metals and minerals are the main building blocks of on-going and expected developments in the region's employment and economy. The expansion, in terms of both turnover and employment, in the mining industry has been remarkable; most likely, employment in the mining sector will double by 2015, due to the opening of new mines in Pajala and Kolari. The impacts of mining on other sectors are of importance, as it is estimated that one new job in mining will generate two new jobs in other sectors. The expanding mining industry will also create investments in infrastructure, logistics and construction. On the other hand, mining projects, as well as other planned larger development projects in energy production and tourism, depend on external financing and foreign investors and are thus heavily dependent on international markets and the economic situation. Furthermore, the environmental impacts and possible resource management conflicts relating to mining activities make it hard to estimate the real employment and economy effects.

The main potential of the tourism industry is in adventure and experience activities. To date, the majority of tourism-related activities, especially outside the major resorts, are seasonal (e.g., skiing); but these can be seen as complementary to other economic activities, particularly primary production.

The main challenges to labour market development consist of the limited size and relative geographical isolation/segmentation of the local labour markets, a high long-term unemployment rate, labour mismatch and a level of dependency on natural resource extraction that is partly connected to the lack of "female jobs". The high seasonality of activities, especially within tourism, is also challenging, though the cross-border dimension can be seen as an advantage. These factors, combined with the aging population, are a challenge for providing services of general interest (SGIs) equally and profitably in the region; for example, the aging population have both increasing accessibility and health care needs, and the lack of education possibilities is increasing the outmigration of already low proportion of young people. There is also a challenge to find a qualified labour force to deliver SGIs, especially within the health care and primary education sector, but also for other social services.

Transport and ICT developments

The possibilities to provide SGIs equally and economically in a changing demographic and economic situation also relate to the character of the services. The mobility and accessibility of people and goods are challenged by the geographic realities, harsh climatic conditions, lack of public transport, and high transport costs. Thus, for example, within numerous local government services, such as employment and economic

development offices and the police, the role of *e-services* is crucial. In education and health care, the possibilities for e-services are more limited. The development of e-services limits, but does not eliminate, the need for travel in the sparsely populated areas.

People are dependent on private cars. Freight transport, on one hand, depends on good connections to foreign markets because the regional economy is strongly export-oriented and, on the other hand, on consumer goods imported to region, including the smaller settlements. The main freight flows to/from the Torne Valley follow a North-South axis. A well-functioning railway system and good maritime transport connections are crucial for the region's export-intensive industries of ores, timber, paper, pulp and metal and engineering industries. The rail network has reached its capacity in many places, leading to high sensitivity to disturbances. For the maritime traffic, the Bay of Bothnia is the logistic centre, but the importance of a year-round deep sea harbour in Norway will probably increase even more in relation to mining products. Air transport is crucial for passenger mobility, but most connections are only to national hubs and capitals.

To increase accessibility, new transport axis and projects, both north-south and east-west, have been planned but little implemented. An important transport project would be the further development of the Bothnian corridor linking the Swedish and Finnish sides of the Gulf of Bothnia and connecting the east-west and north-south trans-national axes in Sweden, Finland, Norway and Russia. In this sense, the Torne Valley could play a crucial role as a crossroads for freight transport from the European Arctic regions and Eastern markets.

Demographic structure and change

Long distances and scattered settlements characterise the human landscape of the Torne Valley. As the municipalities generally have large land areas, a better picture of the distribution of the population is at the settlement level (built-up areas). There are only two core cities in the region with over 10,000 inhabitants, Kiruna and Tornio. These cities, together with all the other five built-up areas with over 2,000 inhabitants, house over 50% of the region's population. Thus the settlement pattern is characterized by relatively densely populated inner cities and other settlements, either along the Torne River or near mines, and almost unpopulated hinterlands.

An age structure with a high proportion of old people, a lack of women (especially of working age) and out-migration are the main demographic challenges. The reasons mostly relate to a lack of education possibilities, a

low proportion of qualified jobs, and a high proportion of seasonal jobs. The lack of centres of regional importance as such is also a factor, as even the regional centres of Luleå, Rovaniemi and Tromsø are far away.

Over the last ten years, the population has decreased -0.7% per annum, i.e., by about 8000 people. However, at the municipal level there is quite a large spectrum of change: generally between the city municipalities, with natural increase or stable natural change, and the more rural municipalities in Finland and Sweden with natural decreases. Almost all municipalities had a negative average net migration balance over the last ten years. As 10% of the regional population change their place of living within the municipal boundaries during the year, the average annual net migration rate of -0.5% describes only a small part of the mobility. The high mobility is related to the large proportion of seasonal employment and the lack of higher education possibilities. In the Swedish Torne Valley, immigration has played an important role.

Out-migration from the region is selective in terms of both gender and age groups. In the working-age population, there are only 89 women to 100 men. The Finnish and Swedish sides of the Torne Valley have similar age structures. Compared to national averages, the municipalities are characterized by a low proportion of children and the younger working-age population, while the proportions of older working-age population and elderly population are high. The aging of the population, with a rapidly growth in the number of retirees, will hit the region rather heavily during the coming years. In addition, the proportion of children and younger people is low, especially outside the main cities. On the Norwegian side of Torne Valley, the population structure is similar to the national average but, as the Norwegian population is generally younger, the picture is rather different.

Identity and social cohesion

The Torne Valley is often cited as a region of its own. This highlights its cultural cohesiveness, in which the multilingual environment, family relationships, and the historical background, in particular, play a major role. The Finnish-speaking minorities in Norway and Sweden and the indigenous Sámi people in all the three countries are, in some areas, the majority of the population. Finnish was the majority language on both sides of the valley until the 20th century, and a minority language on the Norwegian side. Sámi was a minority language all over the region. In recent years, the linguistic and cultural unity on the Finnish and Swedish side of the River Torne has been recognised as Meänmaa (=our land). Meänmaa does not have as strict geographical focus as the Torne Valley

(as a word), and the movement is more popular on the Swedish side of the river, as it highlights Tornedalians as a linguistic minority as well as the cultural unity across the river. In addition, the rights of the Sámi people have increased and been more on the political agenda in recent years.

Environment: economic potential and protection

The Torne Valley has rich natural resources, from large mineral deposits, forests and renewable energy sources to natural landscapes characterized by river valleys, forests, and mountains. These are a major asset for the region's economic, employment and residential attractiveness.

There is a mutual dependency between the Torne Valley and the rest of Europe with regard to supplies of goods and natural resources. In recent decades, the global demand for minerals and metals has grown significantly, together with world market prices. Already almost 90% of the European demand for iron ore comes from Northern Sweden. Northern Sweden and Finland also contribute significantly to the production of gold, silver, zinc and copper in the EU. In the coming years, iron and other ore production – both expanding production in existing mines and opening new ones – will most likely drastically increase, creating new jobs and regional growth. In Northern Norway, the expanding oil and gas activities also affect regional development.

The existence of mineral resources can be a challenge in relation to other natural resource-related potentials such as forestry, reindeer herding, tourism, and also nature protection. The environmental impacts of the mines on nearby ecosystems can be significant, and thus environmental impact assessment is a crucial element of planning new mines. Large areas are under different types of protection, such as national parks and reserves. This spectrum of various types of protected areas provides evidence of the region's environmental value, but also implies the need for guidelines for development plans, as different types and levels of protection allow different types of other resource uses in the area.

The Torne Valley is a significant producer of renewable energy. To date, hydro-electricity is the dominant energy source, but there is also an important potential for wind power, especially in the mountain areas, as well as biofuel production from the forests and other sources. The main obstacle is the limited capacity of the existing power grid.

Conclusions

The Torne Valley is located in the middle of Europe's largest sparsely populated 'territory'. Thus, it has all the 'regular' natural attributes of SPA: a harsh climate; the role of topography (mountains and Torne river) in the settlement process; the role of natural resources in local economic development; and imbalances of both gender and age in the demographic situation. There are also challenges related to the provision of services, especially in the parts between the local centres. In this respect, new forms of governance – such as inter-municipal partnerships, public-private partnerships, cross-border service areas or better use of e-services – may provide means to make service provision less costly for the providers and more efficient and accessible for the customers. The availability of large areas of unspoilt nature may act as a driver for developing adventure or experience tourism. The long-term sustainable use of resources is important. The ongoing development projects, mostly related to mining activities, can be seen as both a potential and a challenge for the region, as the sparse regions require an economic boost to turn the demographic and socio-economic trends to a positive direction; but the necessary investments, relying on external capital, are heavily dependent on the global situation.

The development of cross-border relations in the Torne Valley acts as a driver for local economic development, especially by forcing actors to think 'outside the box', as they need to integrate two (at least) different economic systems. Contrary to most other SPAs, the Torne Valley can position itself as an interface region for a wider trans-national area extending beyond the Arctic Circle, the Barents region. Although the cross-border dimension allows the development of new types of businesses and personal services, the region has also new prospects concerning the exploitation of natural assets. This is the main focus of future development, as shown by the future opening of mines in Pajala and Kolari. Consequently, it is likely that the extraction of underground assets will play an important role in the region's medium- and long-term development. The long, even historic, traditions of cooperation have created rather similar working and social cultures, and thus linguistic or currency related obstacles are not as critical as in many other cross-border regions.

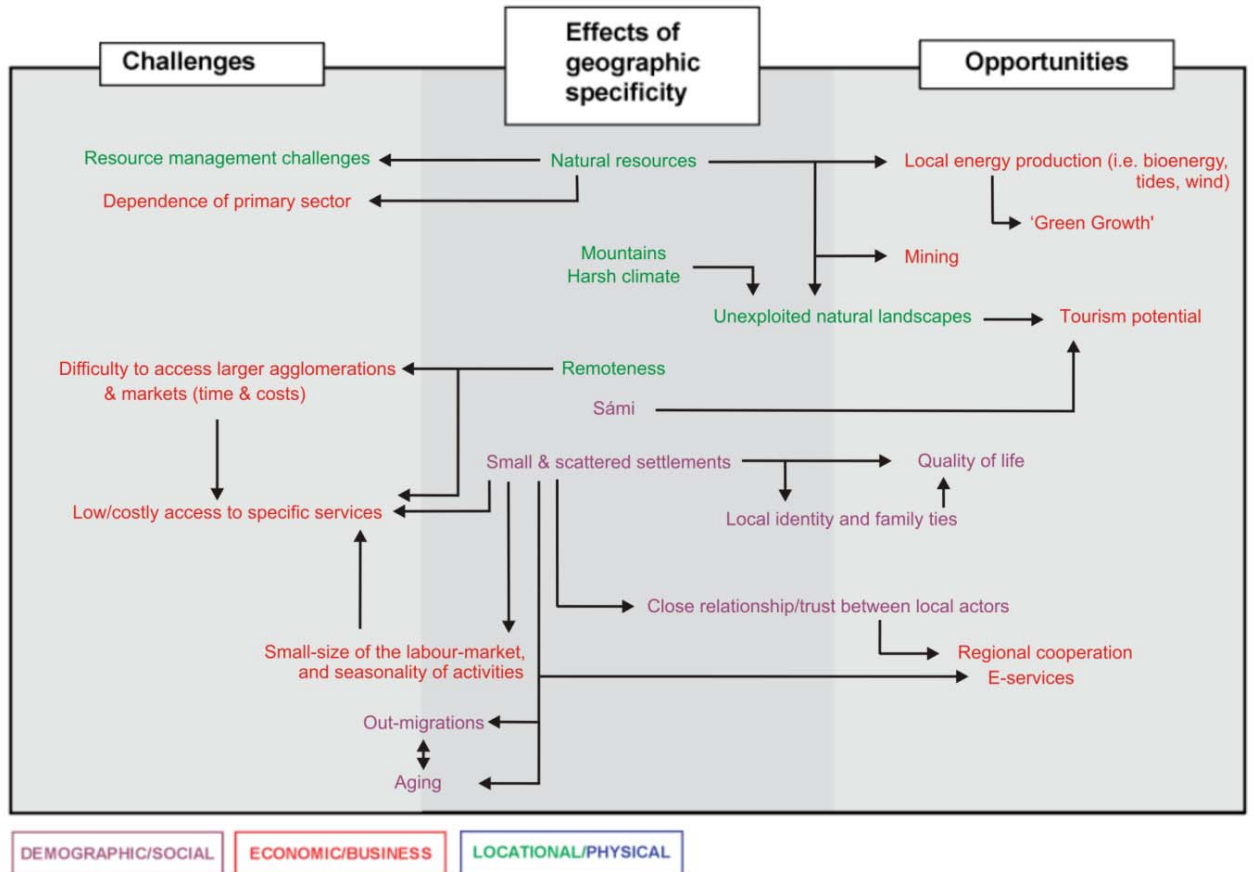


Figure 42 Torne Valley nexus model

Central Spain: Cuenca, Soria and Teruel

The issue of *sparsity* represents an important issue in the context of Spanish regional policy. 9.5% of Spain's land area can be classified as *sparsely populated* at the LAU2 level, using the delineation used in the GEOSPECS project, and 7.7% of the land area can be characterised as *poorly connected*. However, despite the spatial significance of the phenomenon, sparsity has never been approached in a direct way in Spanish regional policy. In the national context, the terms that have been used traditionally are *Less favoured Areas*, or more recently *depopulating areas*, often related to *rural development*.

This case study addresses the development challenges and opportunities of the territory consisting of the provinces of Cuenca, Soria and Teruel. These provinces belong to three different NUTS2 regions (*Comunidad Autonoma*, Autonomous Community), the main regional administrative level in Spain. Cuenca belongs to Castilla-La Mancha, Soria to Castilla y León, and Teruel belongs to Aragon. However, these three provinces

belong to one Sparse Territory, located between the cities of Madrid, Zaragoza, Valencia and the region of Catalonia.

Cuenca, Soria and Teruel have traditionally been disadvantaged regions with remarkable population decreases in Spanish context. In recent years, all three provinces have witnessed an increase of total population and, since 2009, Cuenca has been above the population density threshold of 12.5 inh./km² by which the Green Paper on Territorial Cohesion defines sparsely populated regions. However, this population increase is concentrated in the regional centres and other cities.

Sparsely populated regions need also to be analysed in relation to the national territorial context and its urban system. SPAs in Spain are surrounded by some of the country's largest cities in terms of population (Barcelona, Madrid, Valencia and Zaragoza). Thus, their location between the most important poles of attraction - in terms of economic activity, services and socio-economic development - is one of their largest challenges, but also their main opportunity.

Socio-economic development

Teruel and Soria have had some of the lowest unemployment rates in Spain, both before and after the crisis. The unemployment rate in Cuenca is also below the national average. The youth unemployment rate in these regions is also lower than in Spain on average. The main reason is the economic structure of the regions. The main sectors of employment - agriculture and public services are not so influenced by economic turbulence. Agriculture is still significant in the Spanish SPAs in terms of both economic output and employment: gross value added and jobs in agriculture sector are of much higher than the Spanish average, and the role of service sector is less. Moreover, these provinces have a good level, for Spain, of welfare production. Hence, the provinces are not lagging in socio-economic terms.

Nevertheless, agriculture is heavily subsidised, essentially through Pillar II of the CAP. The relative importance of Pillar II suggests the need for efforts to support rural communities to diversify to other activities: either other land-based activities (e.g. forestry) or activities with potentially greater value-added (e.g. processing of agricultural goods, tourism).

The mining sector has been historically an economic engine for the provinces of Soria (Castilla y León) and Teruel (Aragón). However, a number of mines have been closed or are expected to be in operation only until 2018 after the recent decision of EU industry ministers to cut coal mining state subsidies. This process is expected to have serious effects on both direct and indirect employment in the affected areas.

Many localities in these SPAs have a population structure with a large proportion of elderly people, compared to the Spanish and EU averages. On one hand, aging of the population leads to an increasing need for health and caring services. It also adds challenges in terms of accessibility. Policy makers and planners assume that most local travel is by car, and thus the mobility problems of people who cannot, or can no longer, drive are not addressed. On the other hand, the decreasing number of children is of concern, particularly in the most remote settlements. The closing of schools has large impacts for their development that the transport of pupils to the closest settlement cannot solve.

One potential solution to address the issues of service provision is related to structure and administrative reforms in Spain. A new intermediate level, *comarca*, between those of municipalities (LAU2) and provinces (NUTS3) has been established in order to deal more appropriately with such issues. Other potential actions are operationalised through public-private partnerships. Although the issue of provision of basic services has improved in some parts of these SPAs, it occurs mainly in the local centres, while the situation of rural remote areas has worsened in comparison.

In addition to the landscape, the civil, military and religious heritage of the regions are seen as assets for attracting visitors. The well-preserved and significant cultural and monumental legacy of the old medieval city of Cuenca and the Mudéjar architecture in the city of Teruel has led to the designation of these cities as UNESCO World Heritage Sites. However, most tourism to the area is domestic, often short-term and with important seasonal variations (mainly in summer).

Transport and ICT developments

Traditionally, Spain's road and rail transport infrastructures have been highly polarized towards the main agglomerations, with dense transport corridors between them. Thus, areas in between have limited access to these main communication infrastructures, even if they seem to be near in purely geographical terms. This is the case for the case study region, as it is surrounded by some of Spain's major agglomerations. Even if the travel distances from the SPAs to these major Spanish cities are beyond the daily commuting possibilities (45 minutes), the inadequacy of the transport infrastructure makes these time-distances longer than expected. In that respect, important developments are planned, especially to improve the connectivity of the local centres of the sparse territory to the surrounding agglomerations. A new motorway is planned for the capital

cities of Teruel and Soria, to improve their access to Madrid and other important cities such as Burgos, Zaragoza and Valencia. Some rail transport will be improved: the line from Zaragoza to Valencia via Teruel will be developed, and a new track from Soria to the Madrid-Zaragoza line is planned. However, such improvements, although favouring the case study area as a whole, may weaken the relative accessibility of its remote rural parts.

The concrete example of the creation of a company in Teruel that started on-line sales of its cutlery shows the potential of ICT in mitigating the effects of physical remoteness for business development, and thus as a source of growth for the local business community. Being in the on-line market may thus enable firms to reach out to customers beyond the regional economy; in the case mentioned above, mainly in Latin America. This experience cannot serve, as such, as a blueprint for the development of firms throughout the case study region. However, it provides a concrete example of how access to ICT can help development opportunities to materialize and lead to growth.

Demographic structure and change

The provinces of Cuenca, Soria and Teruel have experienced overall gains of population during the last decade, especially due to positive net migration bolstered by immigration. This trend follows four decades of rural exodus that have affected all Spanish SPAs significantly, with a loss of up to 40% of the population. This exodus particularly affected young people who moved toward major cities and other regions looking for better socio-economic conditions and job opportunities. The result was a loss of young people from the SPAs, exacerbated by the fact that, compared to previous decades, many young people who left the regions did not return. The return migration of elderly people in recent years has accentuated this unbalanced demographic structure. As out-migration was dominated by women, this had a significant effect on the gender balance in the case study region.

Even though the total population in the SPA regions as a whole has increased in recent years, the imbalance between urban and rural municipalities has continued to grow. The main increase in population has taken place in the largest settlements in the regions and their close surroundings. At the same time, the population of most small settlements has decreased.

The increase in total population in the SPAs is essentially a result of increasing immigration, as both domestic net migration balance and natural population change are negative in all the SPAs. Thus, the case

study regions appear to be *transitory labour-markets* for newcomers. This can be due to the relative importance of the primary and secondary sectors in these SPAs, providing opportunities for low-skilled jobs, for which the competition with 'born Spaniards' is less than in the service sector in metropolitan regions.

In conclusion, the most important demographic processes in the SPAs are ageing, increasing gender imbalance and internal migrations which have increased disparities *within* the Sparse Territory; these processes have occurred in small and dispersed localities, while the main local centres have experienced the opposite trends. Thus, SPAs are faced with the societal repercussions of both demographic loss from their rural parts, and growth of its local centres.

Social cohesion and identity

The Sparse Territory of Central Spain encompasses three regional Communities, which form a strong level of government in the Spanish policy system. Being both divided by the administrative system and peripheral in regional terms, the recognition of sparsity as a major issue for policymaking has led to the development of alternative, grassroots movements, the most emblematic being "Teruel Existe" ("Teruel Exists") and "Soria Ya!". These movements, representing bottom-up approaches striving for better territorial governance for the SPAs, aim to draw the attention of regional and national policymakers towards the specific needs of the SPA to ensure long-term local development.

Environment: economic potential and protection

Spain has some of the most important mineral resources in Western Europe. However, those of potentially global importance are not within the Spanish SPAs. In Teruel and Soria provinces, the exploitation of coal is still substantial. Due to the large scale of its exploitation, the activities have left their mark on the local landscape and cultural heritage.

Compared to other regions in Spain, a relatively large proportion of the SPAs is forested, and the cover has been increasing due to land abandonment. Forests and forestry resources are mostly considered in context of decreasing agricultural land use and potential for biofuel production. Wind energy is also a promising prospect for the production of renewable energies.

The forests and other natural and semi-natural landscapes also have natural value, and potential for larger scale recreational and tourism activities. As for all European SPA, the case study region is characterized

by a limited extent of human activities and large untouched spaces, so that few areas are subject to a direct environmental impacts. Even if the number and land area of formally protected areas is small, a remarkable share of these SPAs has been designated within the Natura2000 network – especially the mountain area between Cuenca and Teruel. The main challenge of the protected areas is related to the conservation of their biodiversity and the spatial connections between natural areas, as the number of endangered species has risen in recent years.

Even though the SPAs are famous for some of their agricultural products, such as wine, olive oil and ham, major challenges such as water availability, soil depth, and temperature variations do not permit large-scale exploitation and development of agricultural production. In this context, the development of niche agricultural products seems to be the way forward; one of these niches is ecological agriculture.

The Nexus Model and concluding remarks

The case study shows that the challenges the Spanish SPAs are similar to those of other SPAs in Europe (i.e. Northern Scotland and Northern Norden). Demographic decline, relative geographical and functional isolation, and the small size of the local and regional economies seem to be structural constraints for the growth potential of these areas. With regard to development opportunities, the case study emphasizes the fact that natural assets ought to play an important role for the diversification of local and regional economies in the Spanish SPA. Interesting development prospects are, for instance, small-scale ecological agriculture, wind energy and biomass. Other traditional activities, such as mining, have more limited prospects due to environmental constraints.

This case study region contrasts with other SPAs in Europe in terms of their close geographical proximity to main agglomerations, as it is located between the cities of Madrid, Barcelona, Valencia and Zaragoza. Historically, this 'strategic' position has turned out to be a disadvantage for the region, as the major investments, especially in terms of transport, were made around or through the SPAs in order to connect these cities.

Another point of distinction is the rather weak governance position of the Spanish SPAs. Located at the margin of three to four regions and provinces, it is difficult for the local actors to make their voices heard in a highly regionalized governance system. This situation is rather different from the Scottish and Nordic cases, where formal authorities have prerogatives on the topic, through respectively the Council of Highlands and Islands and the NSPA Network. Being fragmented and peripheral with regard to the regional policy system, the development of grassroots

movements have managed, to a certain extent, to put these areas 'back on the map' by supporting projects that improve their connectivity. Yet, to date, this mainly benefits the regional centres, such as Teruel or Cuenca, which have shown signs of growth, at the expense of the more rural remote parts of these SPAs.

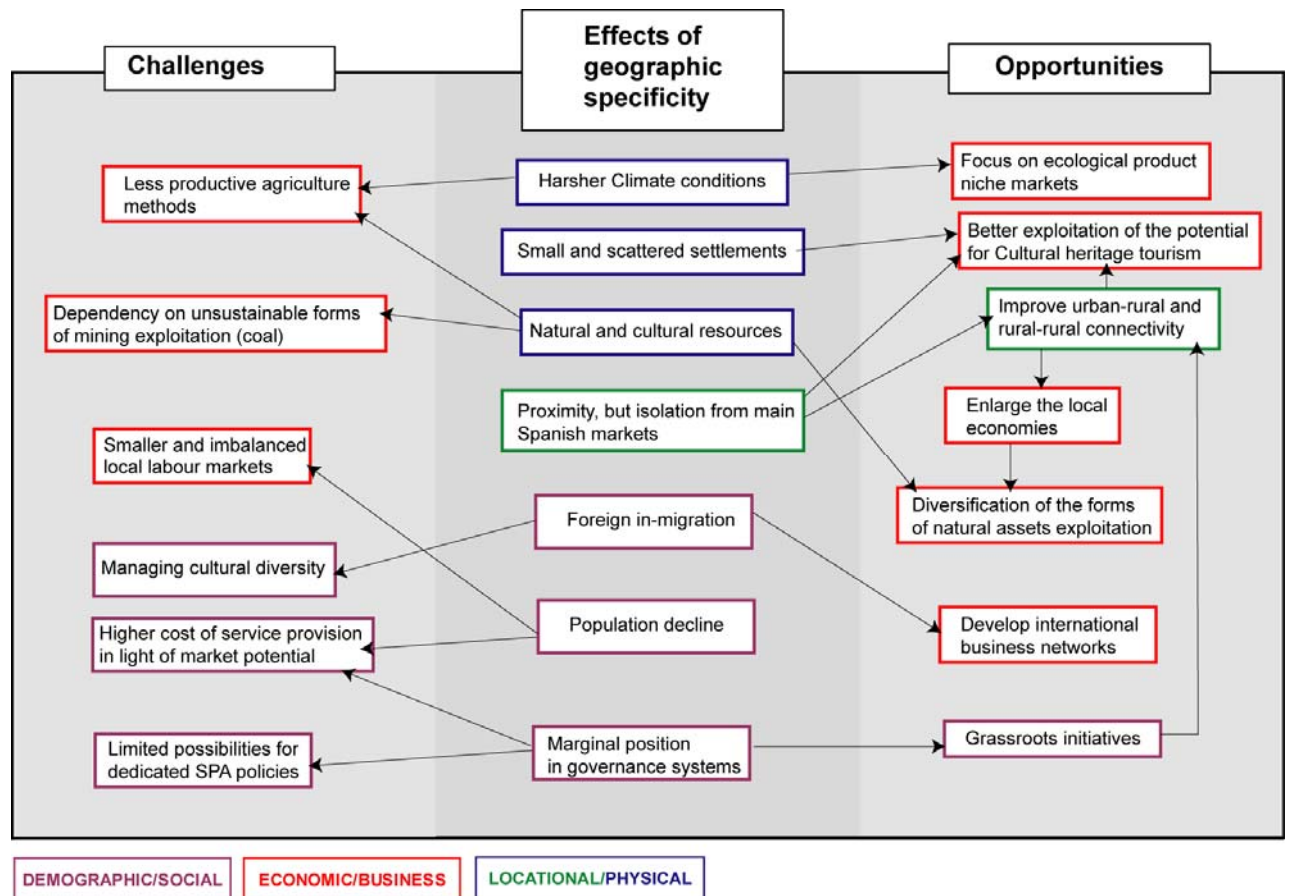
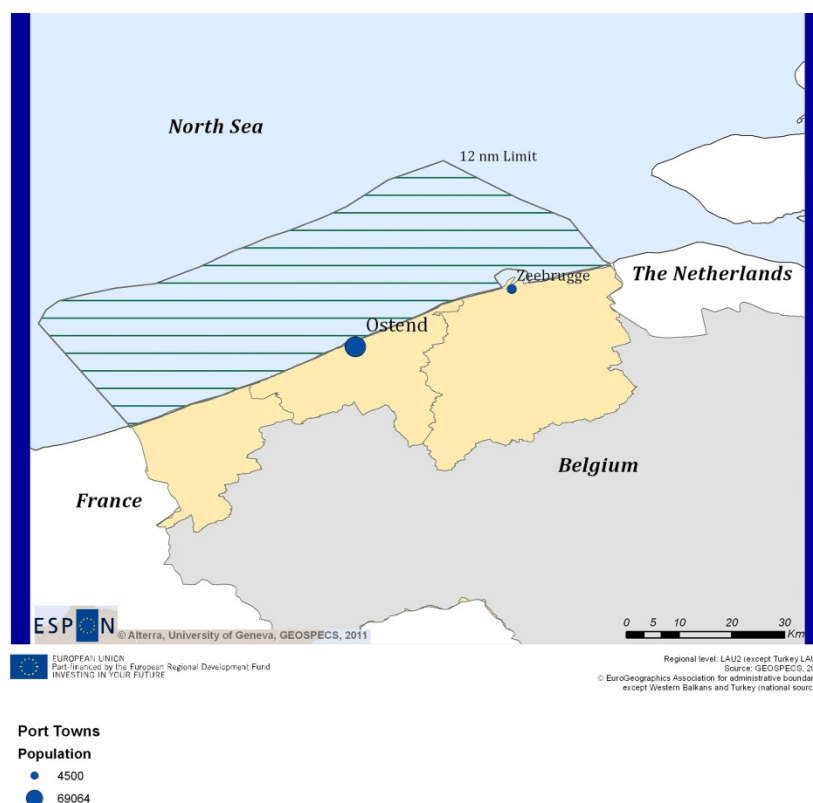


Figure 43 Central Spain nexus model

5.2.4. Coastal areas: Case study reports

Belgian coast

The Belgian coast borders the North Sea. The boundaries of this study area are those of the NUTS 3 administrative areas that have a border with the sea. The two ports of Zeebrugge and Ostend are the main industrial centres along the coast, which hosts one of the densest levels of human and industrial activity in Europe (CARLISLE et al., 2008; LE ROY et al., 2006). Approximately 0.4 million people (4% of the Belgian population) reside in the ten municipalities of the immediate Belgian coast, with an added summer influx of 0.3 million people (LEBBE et al., 2008). The Belgian part of the North Sea lies in the centre of some of the most heavily used marine spaces in the world (LE ROY et al., 2006; DOUVÈRE et al., 2007). Activities include merchant shipping, extraction of marine aggregates, energy production, military, fishing, aquaculture and tourism (KELLENS et al., 2011; BELPAEME et al., 2011; BOGAERT et al., 2009). The intensive use of the coast and offshore environments has led to problems of ecosystem health.



Map 58 Case study area: Belgian coast

Economic structure: In 2006, Belgian maritime activities directly employed 49,000 people and a further 81,000 indirectly (NELISSEN & NEVALA, 2006). Historically, agriculture and fishing dominated the coastal economy (CARLISLE et al., 2008). The continued growth of urban zones

and transport infrastructure is increasingly encroaching on agricultural land. Though the Belgian part of the North Sea is an important spawning and nursery ground for several commercial fish species (e.g. sole, plaice, dab, cod and whiting) (LE ROY et al., 2006; DOUVERE, 2005), fishing activity has undergone severe downscaling as a result of stock depletion, overcapacity and poor policy measures (BELPAEME et al., 2011). Fishing as a sector now contributes only 0.02% to GDP (DOUVERE, 2005). Marine aggregates also represent a growing element of the Belgian coastal economy (VAN DEN EYNDE & NORRO, 2009; LANCKER et al., 2007). Sand, and to a lesser extent, gravel exploitation on the Belgian Continental Shelf began in 1976 and has since quadrupled to approximately 1.9 million m³ per year (VAN DEN EYNDE & NORRO, 2009). However, the dominant sector is tourism, followed by shipping.

Tourism: Though it has experienced recent decline, tourism remains the largest economic sector on the Belgian coast (BELPAEME et al., 2011; FLEMISH GOVERNMENT, 2010; CARLISLE et al., 2008). In 2006, an estimated 9,000 people were directly employed in tourism (NELISSEN & NEVALA, 2006), and a further 10,000 people indirectly (BELPAEME et al., 2011). This amounts to approximately 24% of the coastal region's employment (BELPAEME et al., 2011). Much of the tourism activity of the coast is centred around soft recreation: cycling, walking, horse riding and pleasure cruising (BELPAEME et al., 2011). The maritime heritage also draws visitors. The history of Flanders is intertwined with that of the sea, as evident in land reclamations, the abundance of maritime architecture (e.g. lighthouses, fishermen's houses, hotels, museums), the history of maritime trade, and the long military heritage (BELPAEME et al., 2011).

The tourism industry has had several far-reaching effects on the physical environment of the Belgian coastal zone. The most immediate is the urbanisation of the coastal strip. Historically, small settlements dotted the coastline, but gradually these settlements became connected. The modern Belgian coastline is essentially a large, linear conurbation (CARLISLE et al., 2008), characterised by a severe alteration of the natural environment and significant ribbon developments of apartment blocks (BELPAEME et al., 2011; DE RUYCK et al., 2001). Due to the intense pressure placed on the coast by tourism, it is believed that as much as half of the coastal dunes have disappeared (KELLENS et al., 2011).

Accessibility & transport: Due to its centrality and function as a 'crossroads' for the European core economic area, the Belgian coast derives much of its Gross National Product (GNP) as a focal point for distribution and logistics (BELPAEME et al., 2010; CARLISLE et al., 2008). Ports play a large role in the economy of the country as a whole. Foreign trade accounts for over two thirds of Belgium's GNP (LAGNEAUX, 2005). With many of the major roads becoming heavily congested, it is widely considered that ports and river transport offer a valuable alternative for

the transport of goods, both internally and internationally (LAGNEAUX, 2005). In 2003, the direct value-added (VA) of Belgium's maritime ports amounted to almost €11.5 billion, and employment was approximately 239,000 full-time equivalents (LAGNEAUX, 2005). The dense road infrastructure is an integral part of the success of Belgian ports. A high capacity road network transports goods efficiently and quickly from the coast to the hinterland of Belgium, where the main population centres such as Brussels and Ghent are located.

Important industry has also developed around the Belgian maritime ports. The metal-working industry is the most significant industry in the port of Ostend. In Zeebrugge, naval activities and electronics manufacturing are the largest VA contributors (LAGNEAUX, 2005). However, the shipbuilding industry has experienced the most dramatic decline in the last few decades, falling from over 10,000 employees in 1975 to around 900 in 2003 (NELISSEN & NEVALA, 2006).

Demography: Population densities on the coast vary from 350 to over 2000 per km² (BELPAEME et al., 2011; KELLENS et al., 2011). Prior to the substantial rise of tourism around the mid-20th century, the coastal strip was relatively sparsely populated. Nowadays, in some resorts, the proportion of second homes is as much as 80% of the housing stock; on average, it is around 40% (BELPAEME et al., 2011).

The population is ageing. This trend is the consequence of two factors: the influx of retirees and the outflow of younger people. As a result, there has been an increase in property prices. Recent government policy has attempted to realign the demographic structure with the provision of affordable housing.

Owing to the low-lying nature of the polders of the coastal hinterland, both the permanent and transient populations on the Belgian coast are constantly at risk of flooding and storm surges (KELLENS et al., 2011; MERTENS et al., 2010; LEBBE et al., 2008; VERWAEST et al., 2008). Human habitation along the coast has led to radical structural changes to the natural coastline in the form of hard coastal protection, which accounts for two-thirds of the coastline (VERWAEST et al., 2008).

Biodiversity: The Belgian coast, though very small, comprises a diverse range of geological features that form important habitats (BOGAERT et al., 2009). The offshore environment contains a sequence of sandbanks in the shallow sea, while onshore the coast is mainly made up of sandy beaches, mudflats, salt marshes, sand dunes, fossil sand dunes and polders, many of which are Natura 2000 sites designated under the EU Birds and Habitats Directives (HERRIER et al., 2005). However, many of these features are interrupted by artificial coastal protective structures, such as dikes and seawalls, and other hard structures, such as buildings and

roads. Of the 67 km coastline, 35 km is protected by dikes (DE RUYCK, 2001).

Many human activities have had impacts on the natural environment of the Greater North Sea coasts. Most notable are the effects of fisheries and eutrophication, but changes in the environment caused by exploitation of mineral resources, shipping, chemical contamination, construction, tourism and dredging are also important (OSPAR COMMISSION, 2000). Of the terrestrial systems, salt marshes and sand dunes are most vulnerable. The Zwin tidal inlet is an example of an ecologically important area that is also of economic importance. The Zwin is one of the most visited tourist attractions along the Flemish coast. It is one of the most popular birdwatching areas in Belgium, and one of only two intertidal saltmarshes in the coastal zone. Today the Zwin is mostly silted up, as sedimentation made it too shallow for navigation (CHARLIER, 2011). It is in danger of complete siltation due to past beach replenishments at Knokke-Heist in 1977 and 1986, and the construction of new container terminals in the adjacent harbour of Zeebrugge (DEVOS, 2008).

Renewable energies: In the Belgian marine environment, wind energy is one of the most important economic sectors (LE ROY et al., 2006). The number of wind turbines installed in Flanders increased approximately five-fold from 1997 to 2007 (TOLON-BECERRA et al., 2011). Belgium currently has the fourth highest installed offshore wind capacity in Europe, with a total capacity of 188 MW (LEUNG & YANG, 2012). Though the high wind speeds in the Belgian offshore zone are conducive to electricity production, the sector is still to be fully developed (ODE VLAANDEREN, 2008). As a result of a Royal Decree in 2004, 263.7 km² were reserved for the generation of electricity in the Belgian part of the North Sea (BRABANT et al., 2011).

Studies have demonstrated that the most significant obstacles relating to the installation of new wind turbines are issues of social acceptance at a local level (VAN ROMPAEY et al., 2011; TOLON-BECERRA et al., 2011). Concerns include aesthetic impact, bird mortality, noise and flicker. Such challenges provide ample opportunity for further growth in the offshore wind farm development and to meet renewable energy targets.

Climate change: Over 85% of Belgium's coastal zone is below 5m in elevation (VAN DER BIEST et al., 2008). Mean sea levels have risen at an average of 15 mm per decade over the last century (LEBBE et al., 2008). Projected regional sea-level rise is thought to be of the order of 40 to 70 cm by 2100. Studies have also estimated increases in storm frequency by about 30%, and winter rainfall by 10% (LEBBE & VAN MEIR, 2000). Hence, Belgium is considered to be one of the most vulnerable countries in Europe in terms of the potential impacts of climate change (EEA, 2006).

Climate change is expected to increase flood risk, storminess and beach erosion along the Belgian coast (INGLE & DE SUTTER, 2009; MERTENS et al., 2008a; VAN DER BIEST et al., 2008). Despite the natural and artificial defence structures, the polder hinterland is highly vulnerable to changes in sea level and inundation due to storms. Rising sea levels may result in the salination of groundwater resources: this is considered a major risk in Belgium's coastal plains (LEBBE et al., 2008).

The economic costs of the effects of sea level rise are considerable. About €25 million is spent each year on maintenance of, and investment in, coastal defences along the Belgian coast (LEBBE et al., 2008). For example, between 2004 and 2007, the Belgian coast was replenished with 2.7 million m³ of sand (EUROPEAN COMMISSION, 2009). A number of expensive projects are currently being conducted, including the improvement of the coastal protection at Ostend at a total cost of €55 million (EUROPEAN COMMISSION, 2006).

ICZM: Many perceive the lack of integration in coastal management policies between various government levels and municipalities as the most serious failure in tackling coastal zone issues (DE RUYCK et al., 2001). The governmental institutions responsible for the management of the coastal zone are vertically and horizontally fragmented; this, coupled with the regulatory split between land and sea management, creates obstacles to achieving adequate integrated coastal zone management (ICZM) (BOGAERT et al., 2009). However, as an EU Member State, Belgium has agreed to adopt the principles of the 2002 Recommendation on ICZM. In reality, coastal zone management in Belgium has existed since the beginning of the 1990s. The Recommendation has ensured closer consultation and stronger integration of coastal zone management, and has led to closer cooperation inside and between federal, regional (Flemish) and provincial administrations. There have been a number of important steps in the Belgian ICZM process, including the establishment of an ICZM 'Coordination Point' and sustainability indicators for the coast (the Coastal Barometer) and, in terms of protection against the effects of climate change, an Integrated Master Plan for the coastal safety of Flanders.

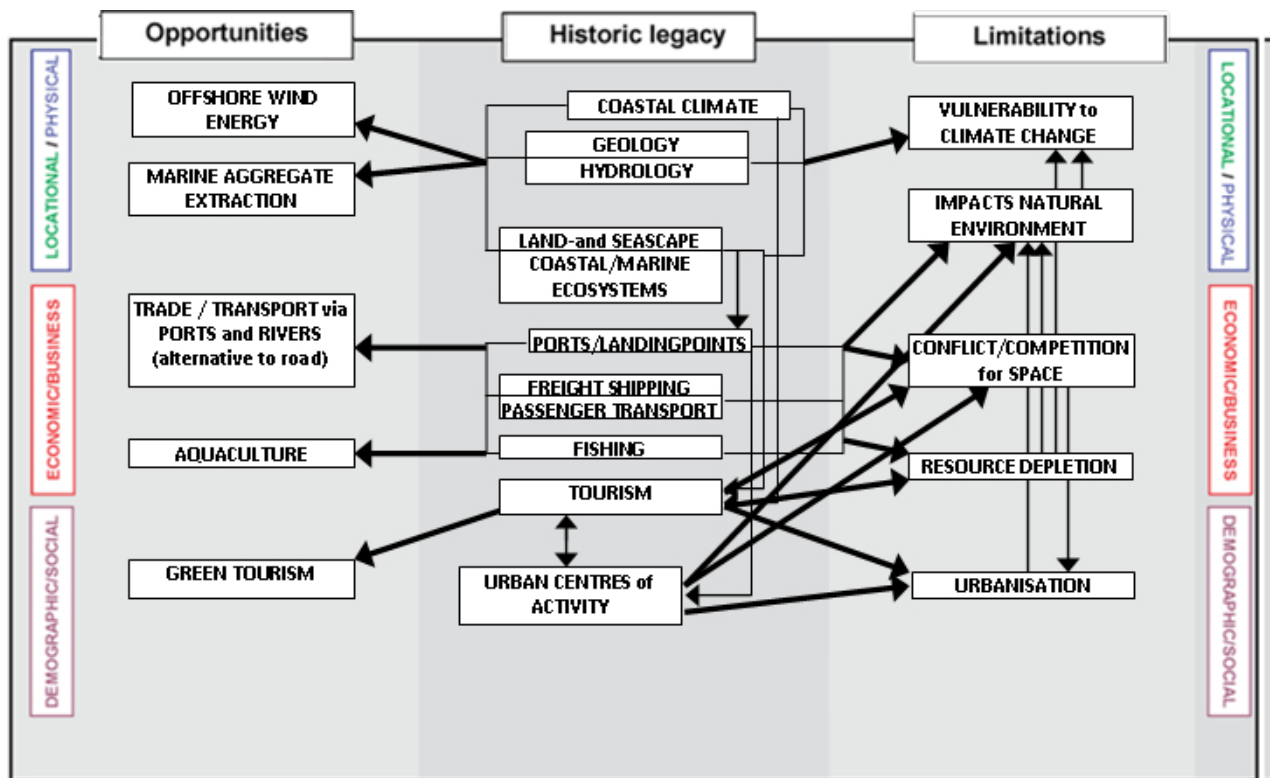
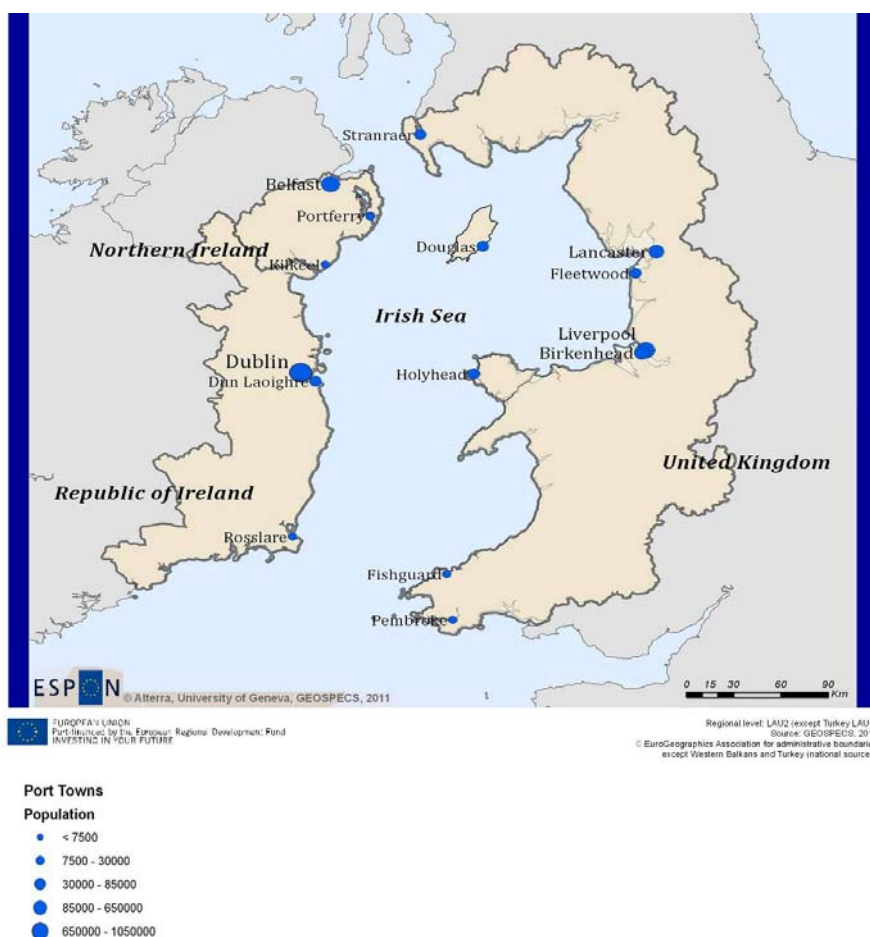


Figure 44 Nexus model Belgian coast

Irish Sea

This partially enclosed sea functions like an inner sea between Ireland, Northern Ireland, Scotland, England and Wales. The shallow sea (20m to 100m depth) borders two international jurisdictions: the Republic of Ireland and the United Kingdom. The case study area is delineated by the administrative boundaries corresponding to the NUTS 3 regions that include the coastal zone framing the Irish Sea.



Map 59 Case study area: Irish Sea

Economic structure: In general, the economy of the Irish Sea region is dominated by shipping (passenger transport and freight trade), tourism and, increasingly, the energy sector. All of these activities rely on the medium of the sea and a coast that can facilitate a variety of economic activities in relation to industrial development, workforce and natural environment.

The Irish Sea includes important fisheries and aquaculture areas (particularly seed mussels) (SUTTON et al., 2008). By 2002, due to declines in stock and quota restrictions, employment in the fishing

industry had dwindled to 1-2,000 people, with a turnover of €86 million (VINCENT et al., 2004). Many fishermen have since diversified into other industries such as tourism and mariculture (DEVOY, 2008). In 2001, the value of the mariculture industry to the Irish Sea regional economies was €18.5 million (VINCENT et al., 2004).

Ports are important for both countries: The vast majority of Britain's trade (95%) is conducted through its ports and, in the Republic of Ireland, 90% of imports and exports came via maritime transport in 2006 (HYNES & FARRELLY, in press). The majority of Ireland's important ports are along the eastern seaboard, primarily as a consequence of historical trade links with the UK. Today, the UK remains the largest importer of Irish goods, and thus Irish ports are vital to the economy of the Irish Republic.

Traditional-style, heavy-manufacturing industries in Ireland (e.g., steel, shipbuilding, and automotive manufacture) were linked to coastal and dockland sites (e.g., Belfast, Dublin and Arklow), but these have either been closed or are of much reduced significance.

Tourism: In the UK, revenue from seaside tourism amounts to approximately £17 billion per year, underscoring the overwhelming importance of tourism and recreation at the coast. Irish marine activities follow a similar overall pattern to those of the UK, although the values are proportionally smaller. Visiting coastal areas and taking part in water-based activities are significant attractions for tourists coming to Ireland (FÁILTE IRELAND, 2007); a survey in 2003 showed that Irish domestic water-based tourism generated nearly half (45%) of the overall domestic tourism returns (MARINE INSTITUTE, 2004). The close proximity of the coastlines of Ireland and the UK makes the Irish Sea accessible to a large number of cruising boats.

However, the importance of tourism is declining with the economic downturn and cheap availability of air travel: Irish Sea resorts such as Morecambe and Blackpool are being abandoned in place of sunnier destinations such as the Spanish Costas, the Canary Islands and France.

Demography: Historically, people settled on the indented European coasts that provided natural harbours, which can be found especially on the coasts of Great Britain and Ireland, encouraging trade, fishing and water transport (HAY, 2003). Ireland's largest urban centres are either port towns or located directly on the coast: 34% of the total population of Ireland (Republic and Northern Ireland) lives within 5 km of the coast, and 50% within 15 km of the coast (DEVOY, 2008). In Great Britain, the major historical settlements were the manufacturing centres of the industrial revolution, and cities developed in areas where natural resources were exploited, not necessarily in coastal areas. While port

towns had huge importance for trade, in the English part of the case study area larger concentrations of towns can be found much further inland.

Holiday and second homes catering for domestic and international tourism markets have been built in parts of the case study area that have been traditional holiday destinations. These destinations developed because of their proximity to the coast and the rural coastal landscapes, perceived as attractive (KEAVENEY, 2007). Most holiday and second homes in the Republic of Ireland are within coastal areas, which have had continually higher housing densities than other areas. Studies suggest that this is due to the influence of conducive natural terrain for the construction of homes, and the desire of a newly-affluent society to live in areas of high scenic value (KEAVENEY, 2007).

Much of the in-migration to the coastal zone involved more affluent elderly people and retirees, mostly from larger urban areas. Coastal town populations, particularly in the UK, are skewed towards older age groups (BEATTY et al., 2008). The proportion of the population over 65 years of age residing on UK coasts is 5% higher than the national average.

The general consensus is that the impacts of second and holiday home development are negative, particularly in the Republic of Ireland (NORRIS et al., 2010; KEAVENEY, 2007; QUINN, 2004), resulting in a plethora of "ghost" estates affecting the socio-economic and environmental systems of the coastal zone. One example is Courtown on the Irish Sea coast, the largest resort in north County Wexford. In summer, it is estimated that 3-4,000 tourists stay in the resort, which has a permanent population of under 400 (QUINN, 2004). As a result of the expansion of housing, the water supply and sewage treatment facilities in the Courtown area experienced significant problems. Second and holiday home development impacts also include landscape intrusion, proliferation of septic tanks and groundwater pollution, increased car traffic, urban sprawl, and the decline of smaller coastal villages (NORRIS et al., 2010).

Biodiversity: The coastal areas contain a diversity of habitats such as dunes, machair, salt marches, lagoons, mudflats, and tidal and sub-tidal areas that support unique plant and animal communities (HERITAGE COUNCIL, 2006).

The natural environment faces a number of threats: sea-level rise, coastal erosion and habitat loss resulting from human activities and uses (COOPER, 2009). Coastal and marine habitats suffer from nutrient runoff, caused by farming practices, that can also affect commercial aquaculture sites. Fishing activity is the most important human pressure in terms of its spatial extent and level of impact on the UK marine environment (STELZENMÜLLER et al., 2008). Habitats in the Irish Sea are rapidly being

transformed and even destroyed by fishing gear, such as trawls and dredges. Industrial-scale fisheries have largely been responsible for the reduction of larger fish species to a fraction of their previous numbers and biomass (ROBERTS et al., 2003). Models suggest that Celtic and Irish Seas cod stocks, for example, may disappear completely by 2100.

Natural resource exploitation: Ireland, in particular, is well-suited for renewable energy production given its geographical location, with some of the best wind and wave conditions in the world. Furthermore, the Irish Sea is close to areas of major electricity consumption (i.e. Dublin, Belfast, Liverpool, Manchester, Glasgow), in which adequate electrical infrastructure already exists (SEAI, 2010). Though Ireland's west coast experiences greater wind strength, the cost to transport the energy to these centres of consumption would be considerable. In addition to this the Irish Sea is a relatively shallow sea and, as such, is more conducive to the erection of wind turbines. The Irish and UK governments have recently announced huge increases in developments of onshore and offshore wind farms. It has been estimated that, by 2020, windfarms will occupy 254 km² in the eastern Irish Sea (VINCENT et al., 2004).

Wind energy remains the main form of renewable energy for the future as, in comparison, the Irish Sea is largely sheltered from the primary wave resource of the Atlantic Ocean.

In term of other resources, the Irish Sea possesses significant natural offshore mineral resources: typically in the form of hydrocarbons and marine aggregates. However, there has been relatively little exploration levels in the last decade (DCENR, 2011c). Marine aggregates, such as sands and gravels sourced from the seabed, are an important economic resource (SUTTON et al., 2008), mainly used as infrastructure materials, e.g. for buildings, roads and bridges.

Irish Sea: Nexus of development factors

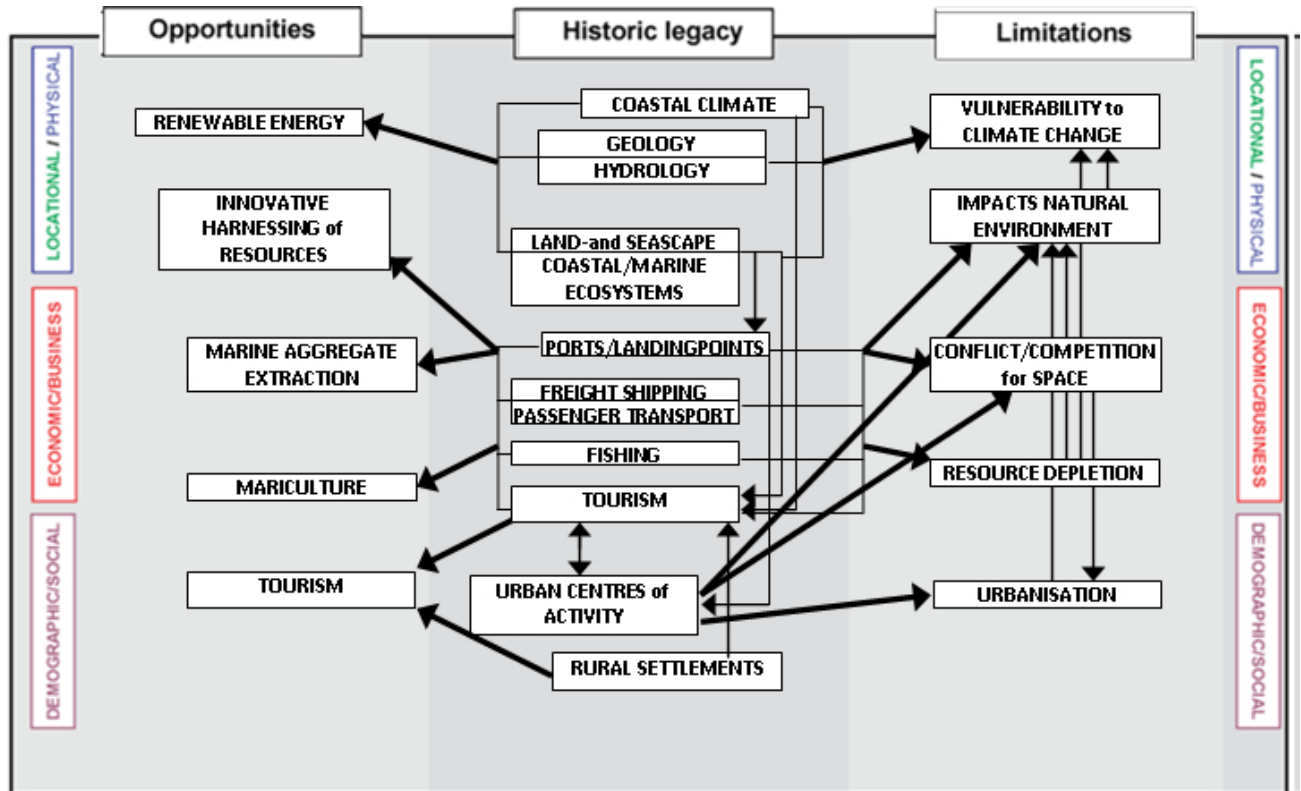


Figure 45 Irish Sea nexus model

5.2.5. Border areas: Case Study Reports

Among the 20 areas which GEOSPECS examined more in-depth in form of a “complete case study” or an “additional case”, four cases addressed border areas and border-related aspects primarily¹⁴¹, and another eight cases also covering internal or external EU-borders analysed such aspects only at a secondary level.¹⁴² The main findings are now presented for each border area case individually and for the other cases in form of an overall summary.

The Czech-German-Polish border

Along the borders of the Czech-German-Polish “Three Corners Region”, quite significant economic discontinuities exist which have their deeper roots in the transformation processes starting after the fall of the Iron Curtain in 1989/1990. The general transformation of the centrally planned economies into market economies also induced in these border areas deep changes of their economic structure and of their population structure.¹⁴³ In 2009, all three sub-areas of the Three Corners Region still showed generally higher levels of unemployment than the average for their respective countries. A comparison of the border areas also shows a great gap in the per capita GDP between the German sub-region, on the one hand, and the Polish and Czech sub-regions on the other. This GDP per capita gap, as well as the unfavourable economic development in some border areas by comparison with their respective national averages, is also the result of other influencing factors. These are mainly the structural particularities resulting from the transformation of central administrative systems into more decentralised governance systems, but also the effects resulting from an opening of the borders and from persisting linguistic and cultural barriers.

As regards the latter, a number of studies on cross-border co-operation in the Czech-German-Polish area show that these linguistic and cultural barriers result from a long-lasting deficit of cultural and social exchange in the region. They continue to generate strong socio-cultural lines of division in the area which constitute one of the most prominent political

¹⁴¹ The Czech-Polish-German border (case study); the Polish-Ukrainian border (additional case); the Luxembourg and Geneva cross-border metropolitan regions (case studies).

¹⁴² i.e. Jura Massif, Tatra Region and West Stara Planina (mountain areas); the Irish Sea and the Belgian Coast (coastal areas) and to some extent also Sicily (Islands); Torne Valley (sparsely populated area); French Guiana (outermost region).

¹⁴³ A large number of jobs were lost in the most strongly affected sectors of industry & mining, which caused a generally high level of unemployment and a high rate of out-migration and also a reduction in the number of births.

and societal challenges. If this challenge remains unaddressed, it will not only hamper cross-border interpersonal contacts but also negatively affect the socio-economic dimension of cross-border co-operation. For this reason, the Three Corners Region should much more strongly enhance the multilingual capacities of its population and institutionalise related efforts at concrete places in the border region through corresponding socio-cultural projects. Good examples in this respect are the socio-cultural projects in the Euroregion Neisse, which were funded by the Micro-Project Fund of the INTERREG programmes. Further to this, more efforts also need to be made to improve the social inclusion of ethnic and cultural minorities in the border areas (e.g. the Roma in the Czech Republic).

Another important challenge in the Three Corners Region is demographic change and its associated effects. Demographic shrinkage is particularly faced by the German and Polish border areas, where major financial and institutional efforts have to be made to maintain qualitatively high levels of education and health systems as well as adequate access to supply systems by way of public transport. As regards the health sector, the expected further aging of the population in all three sub-areas of the Three Corners Region necessitates further public investments until 2020 to create a more age-adequate health supply. In the field of education and training, the EU accession of Poland and the Czech Republic has greatly improved the cross-border situation especially with respect to a mutual recognition of school-leaving and training certificates or university degrees – but important challenges remain. Due to a decreasing share of the younger population groups, the number of child care centres and elementary schools has dropped in all three sub-regions over the past years. As this trend is expected to continue, all three school systems will thus have to face a new adaptation process. Against this wider background, it becomes clear that a further improvement of the R&D/innovation capacity in the neighbouring border regions and a strengthening of their overall competitiveness will require a good and comparable level of education in all border areas and a stronger promotion of co-operation between universities and colleges.

As regards the environment in the case study area, important successes were already achieved which help to slowly convert the previously called “Black Triangle” into a “Green Triangle”. The environmental damage caused by previous industrial and mining activities has been reduced years, and also the designation of a large number of protected areas increased, mainly under the impulse of the EU-wide network of protected areas (NATURA 2000). Cross-border co-operation also considerably contributed to this since the mid-1990s, mainly through the large number of measures and organisational structures supported under the respective

EU programmes. However, the future sustainability of the cross-border area requires more efforts to further improve the environmental situation. These efforts should focus on further reductions of the considerable greenhouse gas emissions caused by road traffic in the border areas and on allocating a much higher priority to establishing cross-border requirements for nature and landscape protection and to developing sustainable forms of tourism¹⁴⁴ (i.e. up to now, much attention was laid on infrastructure projects in the areas of the economy, energy and transport).

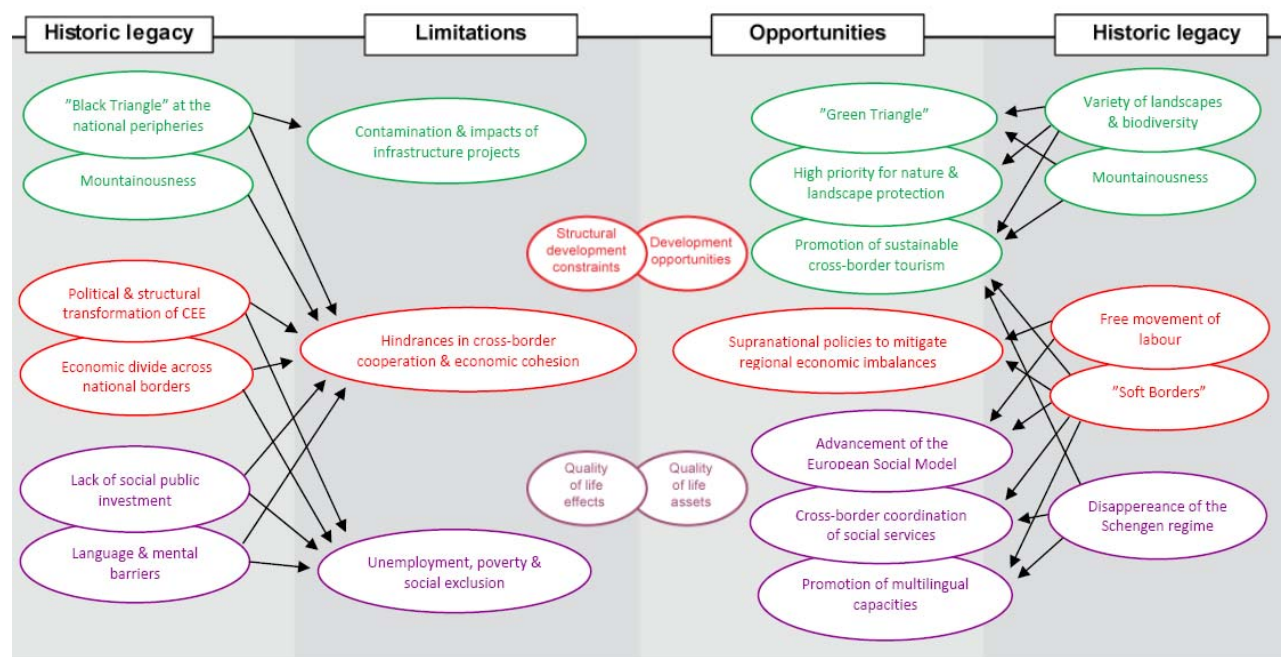


Figure 46 Nexus model: Czech-German-Polish border

The Polish-Ukrainian border

Along the Polish-Ukrainian border, a new line of division has been created within Europe, mostly due to the increased “securitisation” of the external EU borders and a consequence of an application of the Schengen rules following the inclusion of Poland into the Schengen Area in 2007. This line cuts through long-standing and shared cultural, historic and linguistic ties which exist in these borderlands¹⁴⁵ and also hinders the socio-economic

¹⁴⁴ Sustainable tourism can be seen as an important cross-border economic and socio-cultural potential in the Three Corners Region. Especially in the Central Mountains, which always have been a favourite hiking, winter sports and local recreation area, tourism has been revived after its collapse at the time of the political change.

¹⁴⁵ Ukraine means literally “borderland”. The areas adjacent to the Polish-Ukrainian border share a centuries-long common multicultural and multilingual history and have always been a place of transit between the East and West. Even today, these borderlands range

development of areas which are already among the economically weakest regions in both countries.¹⁴⁶ As a whole, this also tends to undermine the general aim expressed in the EU local border traffic (LBT) regulation and the European Neighbourhood and Partnership Instrument (ENPI) regulation: to avoid the emergence of a socio-cultural and economic dividing line at the edges of the Schengen Area.

After the introduction of the Schengen regime, previous positive side effects of the presence of the border (e.g. small cross-border trade) became very difficult, and Ukrainian citizens - as a visible result - have disappeared increasingly from the landscape of border marketplaces in Poland. The Schengen rules also create a significant barrier for inter-personal relations across this border, although the EU Commission aims in general to facilitate the crossing of external EU-borders by locals of neighbouring countries. Despite the conclusion of an agreement on LBT between Poland and Ukraine which came into force on 1 July 2009,¹⁴⁷ the following suggests that the number of negative effects still seem to prevail over the advantages. The introduction of the LBT agreement had a positive impact on the level of border traffic intensity and on the volume of cross-border traffic, which might also stimulate a revival of border trade and thus mitigate the further economic decline of the border areas. However, the procedures of the LBT agreement for obtaining the required documents are not doing enough to facilitate the process for local residents, and the relatively narrow territory of application (30 kilometres) tends to exclude people with cross-border ties who live beyond this zone. In the first years after the introduction of the LBT agreement, only a small percentage of the total eligible population in the Polish-Ukrainian borderland made use of LBT permits and, throughout 2010, Ukrainian was still the nationality most often refused entry at an external EU border, with most refusals taking place on the Polish-Ukrainian border. Finally, migrants and refugees are frequently refused adequate status and remain irregularly in the borderland while refugees who are legally in the Polish-

among the most diverse zones in Poland and Ukraine in terms of cultural heritage and minority cultures.

¹⁴⁶ The GDP per capita of the border areas on both sides is about 70% of the national average and they show an increase of poverty and social exclusion of a great number of households, due to an unfavourable situation on the job market and lack of possibilities to earn an appropriate income.

¹⁴⁷ The LBT agreement allows residents of Ukraine living within 30 kilometres of the border to buy, for €25, a permit to travel up to 30 kilometres in the neighbouring borderland. To obtain this visa, the person needs legitimate reasons for frequent border crossing, such as family links, social, cultural or economic motives, as well as evidence for sufficient funding in relation to the stay.

Ukrainian borderland have become increasingly criminalized and even discriminated against.¹⁴⁸

Although the Polish-Ukrainian border is now an important gateway to the EU, only 6 road crossing points and 4 railroad crossing points are in place along its 535 km length. The existing border crossing points are not sufficient to handle the large transport flows across the border, which happens so slowly that people often have to wait for hours or sometimes, especially for cargo traffic, days. There is only one border crossing check point where pedestrian and bicycle traffic is permitted. Though two new border crossings are planned in order to better process the intensified movement of fans and tourists during the EURO 2012 Football Championship, it is very likely that the associated border security measures will further tighten the permeability of the borderline.

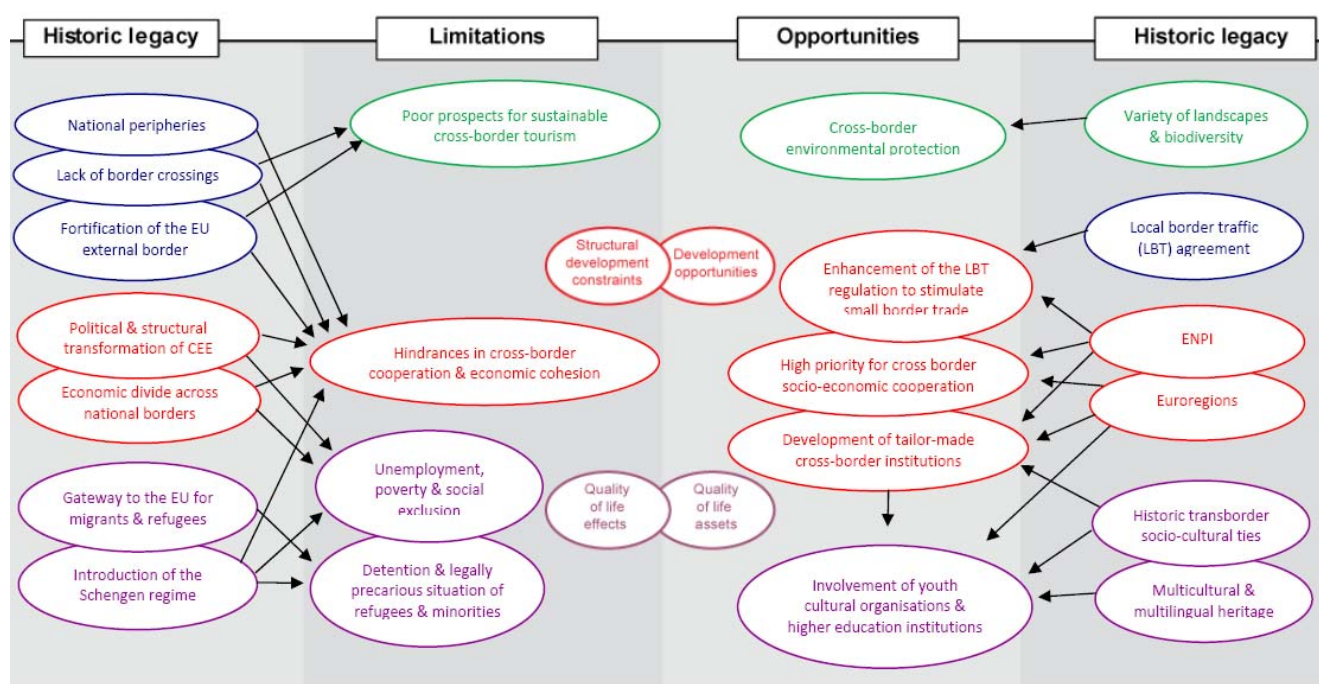


Figure 47 Nexus model: Polish-Ukrainian border

¹⁴⁸ The Ukrainian border guards are allowed to detain persons caught within 50 km of the border in order to examine the purpose of their presence in the borderland. Many asylum seekers spend years in detention or in legally precarious situations, which does not facilitate their integration prospects in the borderland. An arising issue seems to be the rise of xenophobic movements among the public spheres in western Ukraine (i.e. skinheads and racist groups).

The Cross-border Metropolitan Region of Geneva

The cross-border metropolitan region (CBMR) of Geneva has been identified as one of the most dynamic CBMRs in Europe.¹⁴⁹ Functionally, the Geneva region is mostly driven by knowledge-intensive services and manufacturing activities. The presence of specialised financial services in private wealth management and commodity trading, as well as international institutions, is a major driver of the regional population and economic growth. Institutionally, Geneva has long considered itself as an international centre without necessarily trying to build a strong hinterland. In recent decades, however, several initiatives have contributed to the development of more regionally-based strategies with neighbouring Swiss (Nyon) and French territories (Pays de Gex, Savoie).

The Geneva CBMR illustrates that the presence of an external EU border, tempered by bilateral agreements between the EU and Switzerland, does not necessarily constitute a limiting factor for the development of the region. The presence of the border seems to be a key factor which pushes Swiss local actors to interact and find solutions with their neighbouring partners in France in order to ensure the smooth operation and attractiveness of the metropolitan centre. Geneva has benefited from its recent cross-border agglomeration project for developing a common vision of the bi-national region and implementing concrete measures to enhance its regional cohesion. Yet the populist appeal of certain political parties running against cross-border commuters has been strongly expressed in the agglomeration of Geneva.

In the Geneva CBMR, the long-standing national peripherality has resulted in some limitations concerning intra-regional accessibility. This is especially true for interregional railway connections. With the opening of borders and the rise of strong functional interdependencies between the urban centres and their cross-border periphery, such an historical legacy might also be interpreted as a stimulus for local and regional actors to cooperate. Another locational historic legacy is the scarcity of land. This factor is particularly relevant due to the position of Geneva as a quasi-enclave and its restrictive planning policy as far as urban development is concerned. Such 'physical' constraints have considerable consequences for structural development, as they result in fierce competition for land use and high real estate prices.

The significant socio-economic performance differences within the Geneva CBMR also offer opportunities to develop new comparative advantages. This holds true for the visible differentials in wages and income (pull

¹⁴⁹ ESPON (2010): *METROBORDER. Cross-border Polycentric Metropolitan Regions*. Final Report. Luxembourg, European Spatial Planning Observation Network (ESPON).

factor) as well as for the different unemployment rates (push factor) which are all driving forces for a polarisation of labour flows, resulting in strong cross-border economic interdependencies between the metropolitan core and its borderland periphery. Strong disparities can also be observed with regard to the level and distribution of services to the residents. This has led to an important functional division of space, the urban centre being well-equipped and the periphery offering mainly residential services, but very few jobs. The concentration of both public services and business infrastructure in the core of the metropolitan region is a clear indication of its mono-centric structure. The unbalanced urban development that characterises Geneva mainly results from strong wealth differentials, and has not yet been really affected by redistribution measures enforced by cross-border cooperation bodies. Though it has proved especially competitive in economic terms, this kind of cross-border integration represents a risk for social and territorial cohesion at the regional level.

Finally, differences on either side of the border are also very important when it comes to residential attractiveness. The strong average annual population growth over recent decades strongly affects the real estate market, leading to a long-term shortage of houses and apartments available in Geneva and to the development of extensive suburbs in neighbouring France. However, the knowledge-intensive economy of the CBMR is attracting an increasing number of highly-qualified and innovative individuals from around the world, creating a multilingual and multicultural environment. Such a multicultural and multilingual society can be an asset for stimulating cross-border projects between local, regional and international actors across borders and contributing to greater social cohesion.

Nexus model - Cross-border metropolitan region of Geneva

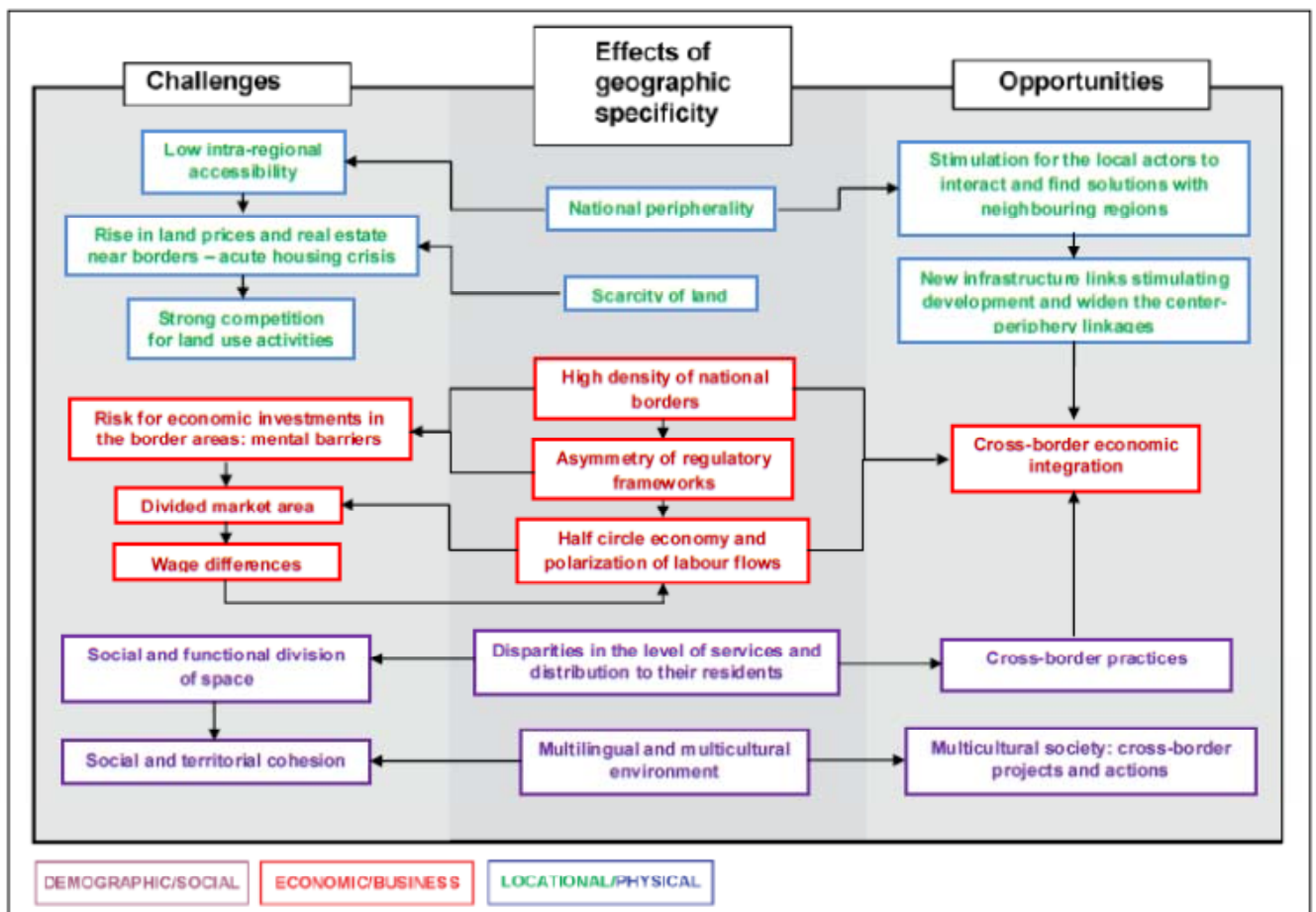


Figure 48 Geneva: nexus model

The Cross-Border Metropolitan Region of Luxembourg

The Luxembourg CBMR is located in the heart of the Greater Region, a cross-border institutional cooperation between Luxembourg, Lorraine (France), Wallonia (Belgium), Saarland and Rheinland-Pfalz (Germany). At the European scale, Luxembourg is a middle-sized European city-region with a very pronounced international profile, mainly based on specialised financial activities and the presence of EU institutions. The proximity of national borders seems to have advantaged the Grand Duchy in its economic development, insofar that it allows Luxembourg to recruit skilled workers from surrounding regions without having to bear the cost of their social reproduction. Furthermore, Luxembourg is experiencing strong demographic growth, with a high proportion of foreigners and an increasing number of cross-border commuters. The concentration of knowledge-intensive activities in Luxembourg is accompanied by strong functional integration of the German, Belgian and French bordering areas.

The long-standing national peripherality has resulted in some limitations concerning intra and inter-regional accessibility, especially for inter-regional railways connections. With the opening of borders and the rise of strong functional interdependencies between the urban centres and their cross-border periphery, such an historical legacy might also be interpreted as a stimulus for local and regional actors to cooperate. Another locational historic legacy is the scarcity of land. The presence of brownfields along the French border has strong consequences on structural development, as it results in fierce competition for land use and high real estate prices.

From a social and economic point of view, the Grand Duchy of Luxembourg and its neighbouring countries have all been part of the Common Market and of the Schengen Area since their establishment. This allows workers to freely cross the borders and work in a neighbouring country. However, differentials in income wages (pull factor) and unemployment rates (push factor) are driving forces for the polarization of labour flows, resulting in strong cross-border economic interdependencies between the metropolitan core and its borderland peripheries.

Strong disparities can be observed with regard to the level and distribution of services to the residents, leading to an important functional division of space, with the urban centre being well-equipped and with the periphery offering mainly residential services but few jobs. Due to the strong difference in real estate prices between the Grand Duchy (high) and its neighbouring countries (low), a significant number of households have chosen to leave the urban agglomeration both for the domestic

periphery and for the neighbouring countries.¹⁵⁰ However, despite the high differentials in real estate prices, the Grand Duchy remains an attractive place for workers who can afford it. Good access to urban amenities specific to a metropolitan centre and the proximity to the place of work are also strong incentives.

The Grand Duchy has experienced strong demographic growth over the last decades, mainly because of the combination of financial activities and employment in European institutions. The knowledge-intensive economy of the CBMR attracts an increasing number of highly-qualified and innovative individuals from around the world, creating a multilingual and multicultural environment. In addition to wealthy and creative expatriates, cross-border workers also contribute to the cultural diversity of the CBMR. Such a multicultural and multilingual society can be an asset for stimulating cross-border projects between local, regional and international actors across borders and contributing to greater social cohesion.

¹⁵⁰ This phenomenon is known as 'residential escape', which in the case of Luxembourg is also coupled to the emergence of a growing flow of "in-commuting nationals" (i.e. former Luxembourg residents who now live on the other side of the border but still work in Luxembourg).

Nexus model- Cross-border metropolitan region of Luxembourg

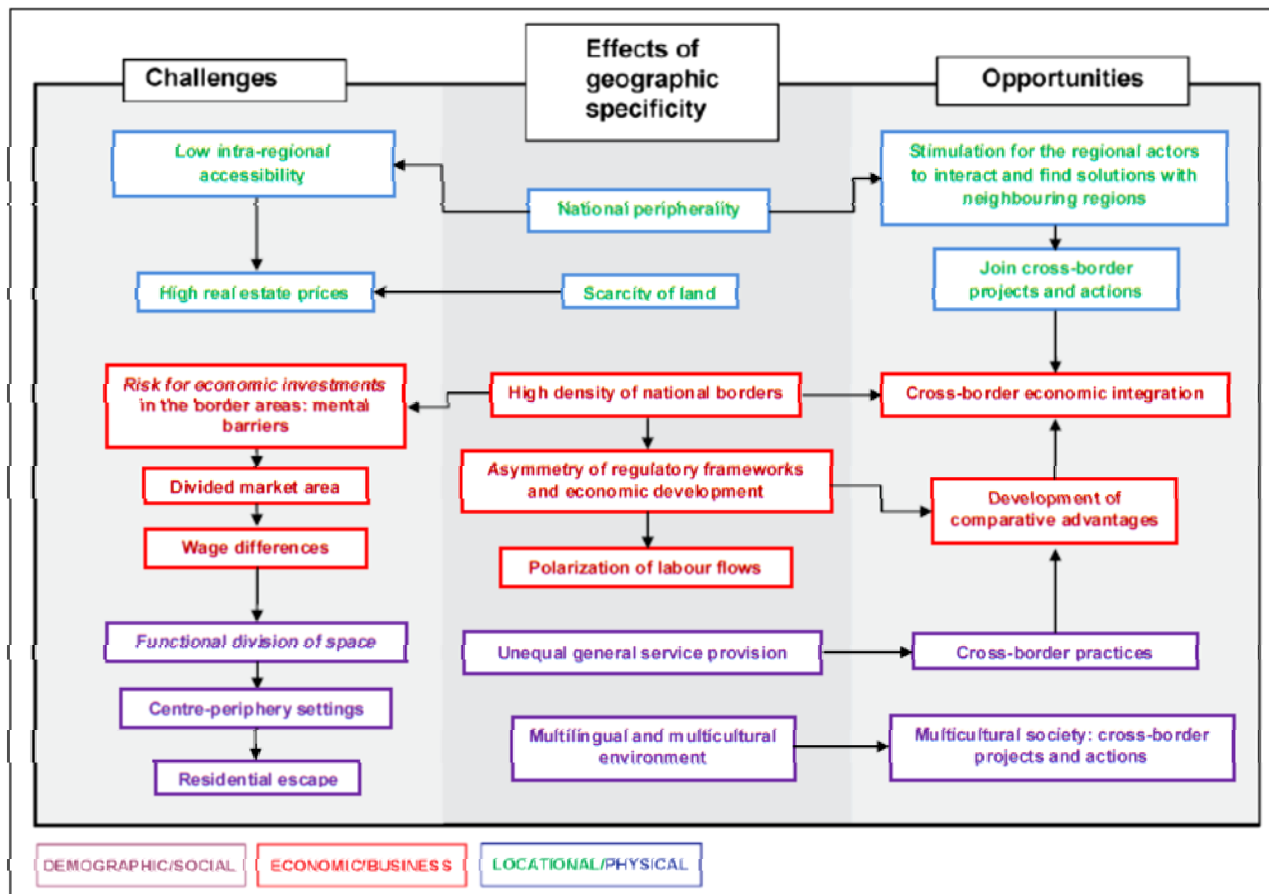


Figure 49 Geneva: nexus model

Importance of intra-urban firm linkages data for the analysis of economic regional integration

European integration and the abolition of the Iron Curtain have opened many national political borders, resulting in the urbanization of borderlands and the emergence of cross-border metropolitan regions (ESPON 2010, Sohn, Reitel and Walther 2009). In a world being transformed from a '*space of places*' into a '*space of flows*' (Castells 1996), a border region can thus be seen as peripheral from a territorial point of view, but central from a network point of view. The nature and extent of economic relations "such as communication between two office locations or business relations with customers, suppliers or technology producers" substantially determines the position of border city-regions in the global city network (Goebel and Thierstein 2006).

The ORBIS database (Bureau Van Dijck 2010) provides information on economic relationships between the headquarters of companies and their subsidiaries. Such data enable different types of firm networks to be distinguished. Economic linkages between firms within a nation state illustrate the existence of domestic or local networks, while linkages across a border reflect the existence of transnational networks.

With regard to a border region, the examination of intra-firms linkages can contribute to understanding its economic embeddedness from a multi-level perspective. On one hand, the number and nature of links between firms located within the cross-border region reflect the level of cross-border regional economic integration. On the other hand, the number and nature of links between firms located within the border region and other regions illustrate the level of national, European or global economic integration depending on the scale considered. Comparison between these two measures allows the economic profile of a border region to be assessed from a relational point of view.

We believe that the organizational and spatial patterns of intra-firm networks have important implications for the territories in which they are located, and vice versa. According to agglomeration theory, the existence of regionally integrated ties/networks is important if regions are intended to attract and embed exogenous investments (originating from supra-regional networks). In concrete terms, insight into the spatial organization of firm networks enables policy makers and entrepreneurs to have a better understanding on how networks of cross-border firms' function, and the conditions under which these networks foster cross-border regional integration.

Cross-border firm networks in the Greater Region (the case of Luxembourg)

The ORBIS dataset enabled us to investigate the number of ownership linkages and their spatial pattern in the Greater Region. This showed that the firms are concentrated in a number of cities, reflecting the existence of multiple centres. However, while nodes (firms and cities) displayed a polycentric spatial pattern, ownership linkages displayed a monocentric pattern.

The overlay of the city networks with the border areas based on 45-minute travel distance to the borders, showed that most of the ownership links concern cities located in border areas. Only a few ownership linkages go beyond the border areas (e.g. Nancy- Luxembourg, Koblenz-Luxembourg, Mainz-Luxembourg). Given the presence of four state borders within the Greater Region, it was necessary to distinguish between linkages within a single cross-border area (two adjacent border areas separated by one border) from linkages between different border areas (related to different borders). On this basis, we found that, of 189 cross-border ownership links, 92 have a regionally integrated character and are located within the functional cross-border area of Luxembourg.

The asymmetric pattern of regionally integrated and supra-regional linkages reveals the level of integration and connectivity between border regions of the Greater Region. On one hand, the frequency of *regionally integrated linkages* between Luxembourg and the regions of Lorraine (especially with Thionville) and Saarland (Saarbrücken) shows a high level of economic integration and connectivity. On the other hand, the frequency of regionally integrated linkages between neighbouring regions of Luxembourg shows a low level of economic integration and connectivity. Considering the overall spatial pattern of firm networks in the Greater Region, we can conclude that most follow a hierarchical spatial pattern and form a star-shaped structure, with Luxembourg at the centre of most networks. Luxembourg polarizes most of the connections of other cities, due to its central position in the Greater Region, its level of economic development, and its position in global networks. This situation points to the need to encourage and create better conditions for the creation of cross-border firm networks between neighbouring regions of Luxembourg in order to achieve a higher level of integration.

The frequency of *supra-regional linkages* in the Greater Region also shows the central position of Luxembourg in these networks. For instance, there are significantly more linkages between Luxembourg and Wallonia (with Liege and Charleroi) than with Lorraine, Saarland and Rheinland-Pfalz. In terms of spatial pattern, the supra-regional networks are hierarchical and star-shaped. There is also evidence of a few heterarchical networks (e.g. network of Luxembourg-Liege-Manhein-Thionville) connecting more than two regions. These networks reflect positive change in the evolution of

networks and strengthen the economic integration of the different components of the Greater Region.

Conclusion

To distinguish positive and negative effects of each type of border, we used the GEOSPECS delineation based on the 45-minute travel distance to a border. In the case of the Greater Region, our results confirm that the majority of cross-border links occur within this travel distance, reflecting positive border effects. The highest number of connections within this range is across the Luxembourgish-French border, with the strongest tie between Luxembourg City and Liege. Strong links are also observed between Luxembourg and Charleroi, and between Luxembourg and Thionville.

Further research is required to deepen the meaning of these results. Interviews with locally-involved firms could first help to understand firm location-strategies and identify possible shortcomings. This could lead to analysis of the variables considered by entrepreneurs when they decide to settle beyond state borders, to determine whether the benefits of cross-border linkages are really superior to the legal and administrative obstacles that they generate, and the share of the benefits of cross-border economic differentials in comparison with so called "untradable interdependencies" (Storper 1995) that influence economic actors under conditions of uncertainty.

Interviews with state or regional representatives would also allow evaluation of institutional responses to the development of cross-border linkages in the Greater Region. This would lead to analysis of whether cross-border business is encouraged by public policy or is the result of opportunistic entrepreneurs, and also test Scott's (1999 : 613) interesting argument, that, in contrast to North America, "border regions policies in Europe "have maintained an administrative, bureaucratic character that appears to have inhibited private-sector participation"

A more detailed elaboration can be found in Annex 36.

Evidence from other cases also covering border areas

A number of complementary findings are revealed by the cases which addressed other geographic specificities of GEOSPECS and also covered different internal and external EU borders. A summary presentation of

these findings is now realised alongside the individual aspects of the “multi-dimensional reality” of European borders (see also section 3.2.5).

The status of the political border still plays a significant role especially along the external EU border between France and Switzerland. The case of the *Jura Massif* shows, for example, that the cross-border commercialisation of French wood processed in the Jura still encounters multiple problems. This is due to the limited number of customs posts and to existing customs formalities or the Swiss rules for tonnage limits and for the maximum height of vehicles, but is also a consequence of the high value of the Swiss Franc. For cross-border provision of services of general interest, it seems that the most influential factors with a negative impact are the different administrative and regulatory settings or proceedings on either side of the border (i.e. limiting border-crossing access to services especially in the *Jura Massif*). However, equally important for this particular aspect is a lack of “critical mass” in terms of population (i.e. infrastructure and services only available in the urban centres, often far from the border especially in the *Jura Massif* and *Torne Valley*): an influential factor that is not directly associated to the status of the border.

The “barrier effect” represented by natural obstacles plays a prominent but also ambivalent role in most of the cases. These obstacles, on one hand, hamper transport and/or communication and lower the intensity of all types of exchange relationships (e.g. *Irish Sea*, *Sicily*, *French Guiana*, *Tatra Region*, *West Stara Planina*), but they also induce unbalanced flows (e.g. *Belgium Coast*¹⁵¹; *Irish Sea*¹⁵²) or can even generate specific behavioural patterns (e.g. self-referential attitudes of Sicilians due to insularity). On the other hand, however, mountains or larger maritime separations also establish *per se* spaces with a significant natural value (i.e. unique and fragile landscapes or ecosystems, high biodiversity) and can even help to preserve such spaces due to difficult or non-existent accessibility (e.g., high mountain zones). While these spaces constitute a general challenge for border-regional and cross-border environmental management (e.g. trans-border protected areas in mountain areas, integrated coastal zone management), they are also important assets for the development of eco-tourism and the production of region-specific goods or of specific high-quality food. However, the extent to which such opportunities are realised in practice for promoting a sustainable territorial development of border and cross-border areas is highly variable. While awareness may be weakly developed (e.g. *Tatra Region*, *West Stara*

¹⁵¹ Due to the non-existence of terrestrial accessibility obstacles, substantial tourism flows into Flanders coming from the neighbouring countries (i.e. the Netherlands & France). The tourism coming from the opposite side of the Channel (i.e. the UK) is considerably lower.

¹⁵² Ireland imports and exports the large majority of its goods by sea (90% in 2006).

Planina) or other less sustainable development options may predominate (e.g. mass tourism¹⁵³), there are also some visible successes such as in the *Jura Massif*¹⁵⁴ and some parts of the *Belgium Coast*.¹⁵⁵

Although it appears that there are no significant overall economic discontinuities at the borders of the cases examined, such discontinuities exist for specific aspects and for more complex constellations. Significantly different levels of taxation, for example, exist along the Swiss-French border (e.g. *Jura Massif*) and a lack of cross-border fiscal integration hampers cross-border economic integration in the *Torne Valley*. There are also strongly diverse standards of living, generally resulting from wage differences and different purchasing power (i.e. being even reinforced by exchange rate differences between Euro zone and non-Euro zone countries). Although the latter factors stimulate cross-border commuting, especially in the *Jura Massif*, they also tend to generate clearly one-sided effects which negatively influence the territorial development of individual border areas (e.g. out-commuting of young and/or highly qualified labour force and workforce shortages on one side of the border; strong cross-border consumer flows towards one side).

The primary socio-cultural settings prevailing in the border/cross-border areas examined are highly variable,¹⁵⁶ which suggests that, especially in cases of a marked heterogeneity also strong socio-cultural lines of division tend to exist. However, the evidence also shows that an apparent homogeneity does not automatically result in a complete absence of socio-cultural lines of division. The existence of a shared history and of socio-ethnic cohesiveness (e.g. *Torne Valley*)¹⁵⁷ or of common traditions (e.g. *Jura Massif*)¹⁵⁸ and especially of the same language spoken on both sides

¹⁵³ This is the case for the planned winter sports development in the Tatra Region & in West Stara Planina, but also for the massive seaside tourism along the Belgian coast.

¹⁵⁴ e.g. high quality cheese production of strong added value; destination for cultural tourism & family-based tourism; existence of regional nature parks & planned establishment of a cross-border nature park.

¹⁵⁵ e.g. the joint management of the ZWIN inlet between Belgium & the Netherlands, the joint management of the Schelde estuary, the initial application of ICZM principles and coastal protection measures in Flanders.

¹⁵⁶ In some, there is (ethno-)linguistic overlapping across the political border (e.g. *Jura massif*, *Irish Sea*, *Torne Valley*, to some extent also the *Belgian coast* & *West Stara Planina*), while in others there is a hard linguistic line of division which closely follows the political border (e.g. *French Guiana*, *Tatra Region* and to some extent also *Sicily*, especially regarding *Malta*).

¹⁵⁷ Although the *Torne Valley* is a multicultural cross-border area, the existing ethno-linguistic minorities – also linked through many cross-border family ties – are formally recognised in all three countries (i.e. *Sámi people*, *Finnish-speaking minorities* in *Sweden* & *Norway*) and their respective cultures/languages are also pro-actively furthered (e.g. through cultural self-governance and own regional representative assemblies).

¹⁵⁸ e.g. mountain society based on dairy farming & cheese production; watch-making tradition in the valleys

of a border (e.g. *Jura Massif, Torne Valley, Irish Sea*) considerably facilitates all sorts of day-to-day cross-border exchange relationships and constitutes an important asset which furthers the territorial development of border areas and the integration of cross-border areas (e.g. easier cross-border job-seeking and commuting, easier contact/relationships among local and regional businesses; easier inter-administrative communication). However, the presence of a solid “cross-border social capital” still seems to be more the exception (e.g. *Torne Valley*) rather than the rule because, in some areas, it appears that the existing elements of a common historical or cultural legacy have not (yet) been strong enough to also establish a broadly shared cross-border identity (e.g. *Jura Massif*¹⁵⁹, *Irish Sea*¹⁶⁰).

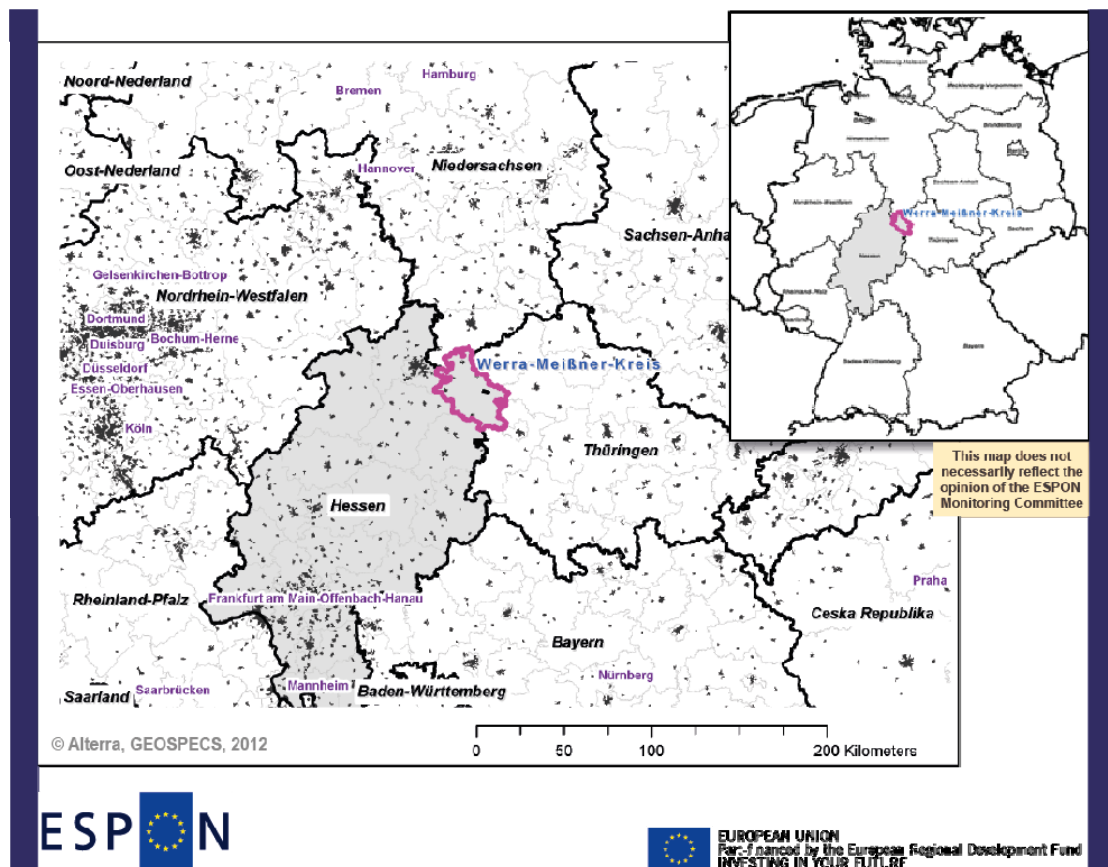
¹⁵⁹ i.e. persisting prejudices which were formerly fuelled by religious differences (Catholics-Protestants), nowadays more so by the considerable differences in purchasing power.

¹⁶⁰ The case of the UK-Ireland relations is certainly particular, because of the legacy of long-lasting political and religious conflicts which do not facilitate progress towards a real cross-border identity.

5.2.6. Inner Peripheries: Case study reports

Werra-Meißner-Kreis

The district of Werra-Meißner ("Werra-Meißner-Kreis", WMK) can be described as an inner peripheral area in the north of the Federal State of Hesse, located in the centre of Germany. The capital of the district is the small city of Eschwege (about 20,000 inhabitants). The district has an area of 1025 km², and a population (2010) of 103,750. It is located in the border triangle of the federal states of Hesse, Thuringia and Saxony. Before the reunion of East and West Germany, WMK was at the edge of the inner German border. Of the 327 km of district border, 121 km are situated along the border with the (new) state of Thuringia, located in former East Germany.

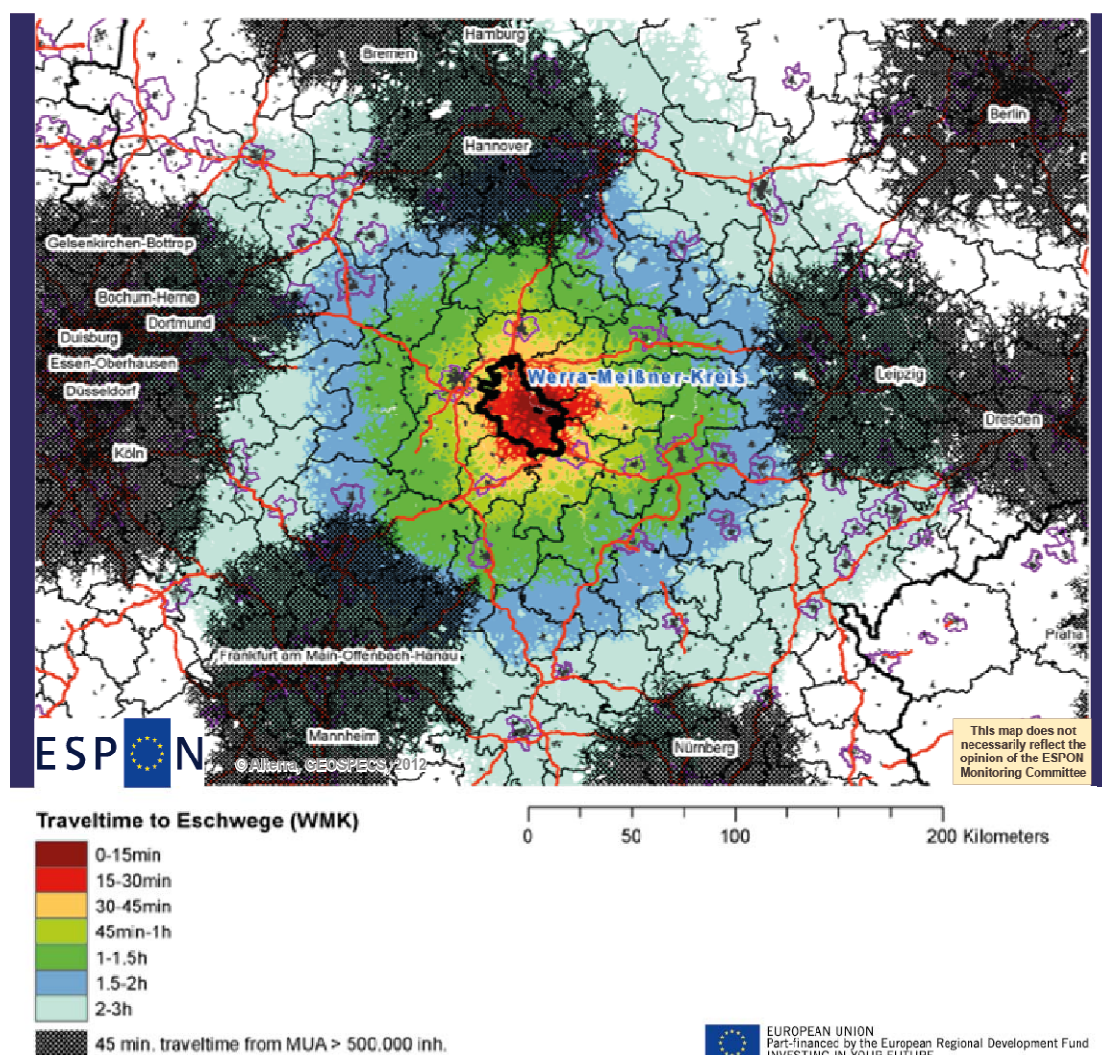


Map 60 Location of the Werra-Meißner Kreis (WMK district) in the center of Germany

The location of WMK in the centre of Germany does not mean that it plays a very central role. From the map below, showing the travel time to MUAs with more than 500,000 inhabitants, it is clear that WMK is on the periphery of five major agglomerations, each situated just over 2 hours of travel time from WMK. This means that the region is definitely outside the

daily commuting distance and therefore too far from these centres to have a strong structural relationship with them.

When looking at the regional scale, the situation is not much better. WMK itself does not contain a MUA, but is again situated in the periphery of smaller MUAs such as Göttingen, Kassel, and Eisenach. This also explains why a high percentage (about 30%) of the working population has to commute to other districts for work. With railway lines to Göttingen, Eichenberg, Kassel and Eisenach and Highways 4, 7 and 38, WMK has very good access to the rest of Germany. However, the Highways are situated mainly at the edges of the district. Once the new Highway 44 crossing the district from Northeast to Southwest has been completed, this will change.



Map 61 Travel time to MUAs > 500.000 with WMK situated in the periphery of 5 major MUA's

Trends in demography and economy: WMK is strongly affected by demographic change. With a low birth rate and outmigration, WMK is losing population quickly compared to the rest of the Federal State of Hesse. Since the unification of Germany, WMK has had a poor economic development compared to the other districts in former West Germany: from 1992 to 2000, there were significantly lower values for GDP per employee and GDP growth, and the unemployment rate was significantly higher (Kawka, 2003).

Emigration numbers are high, due to the distance to the main development centres, which means it is not possible to commute on a daily basis. WMK also lacks higher education institutes (e.g. in the form of a university). Consequently, young people have to leave for education, and many never return. The decline (> 10% in the last 10 years) is expected to continue in the next 25 five years. This decline and shift in age structure is making it challenging for the region to maintain existing services of general interest.

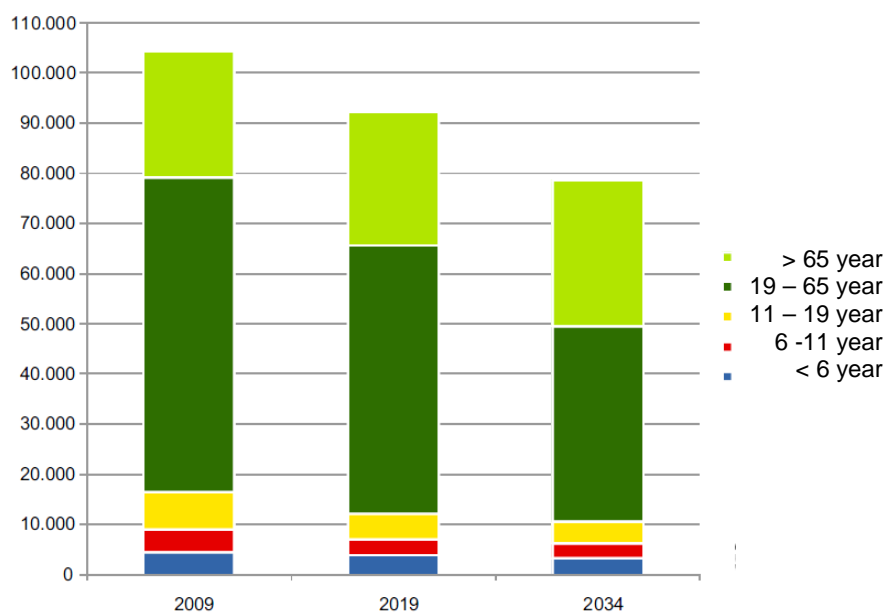


Figure 50 WMK expected age structure 2009-2034 (Source: Vfr 2011)

Planning development: The WMK has recently implemented the pilot project "region creates the future" of the Federal Ministry of Transport, Building and Urban Development (BMVBS) and the Federal Institute of Building, Urban Affairs and Spatial Development (BBSR). For GEOSPECS, this is an interesting example of how a region can plan its development in an organized way. The aim of the pilot project was to show examples of how a region can face the challenges of demographic change and what strategies lead to success. The project included a six-month process in which a "Master Plan for development" was created, with participation from a broad variety of actors from different bodies and institutions.

Based on this plan, more than 25 development projects have been implemented.

The greatest need for adaptation can be seen in the field of social services for families and older people, and secondarily in the fields of culture and education, energy, residential areas and accessibility. By using an integrated approach, targeted measures could be drawn up for different parts of the district. For instance, in the field of public transport, proposed measures ranged from “Rescheduling of existing bus-lines” to “On-demand transport combined with existing lines”, depending on the specific challenges in each part of the district (Vfr, 2011).

In WMK, the options to turn around the negative effects of the ongoing processes has been given back to the people of the region (with some help and money from outside). The inclusion of the views of citizens in the all stages of the planning process creates awareness, appoints responsibilities and can open opportunities for (re)introducing (new) forms citizen participation.

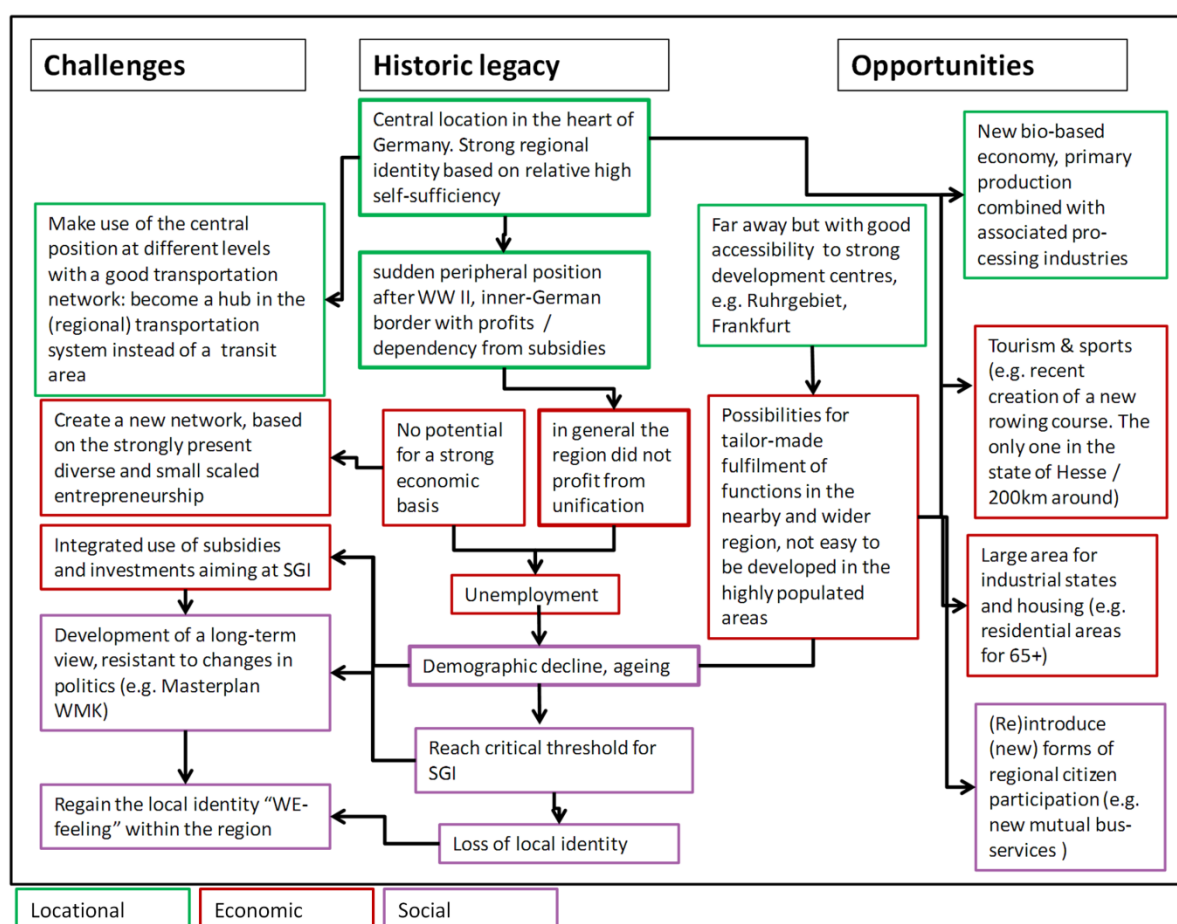
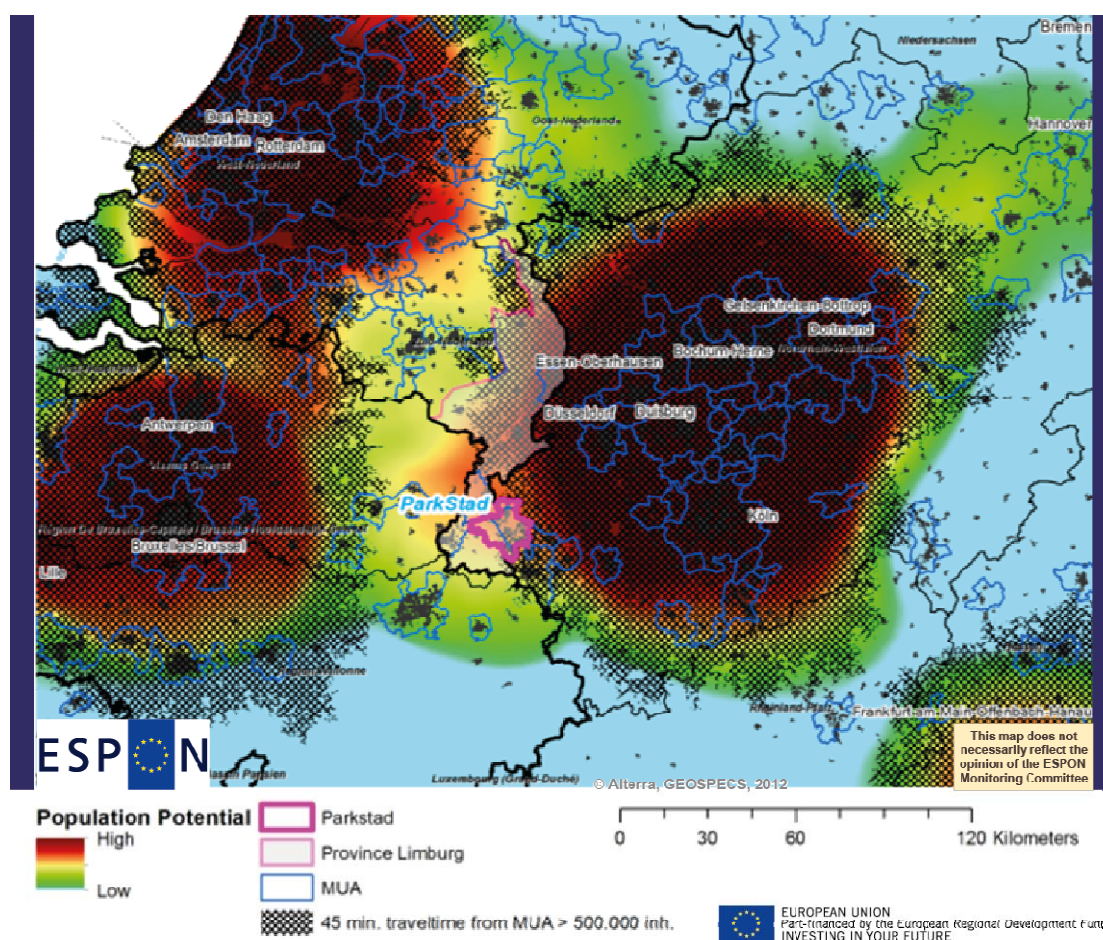


Figure 51 Werra-Meißner-Kreis: nexus model

Parkstad

Parkstad Limburg is a sub-region of the province of Limburg, situated in the south-eastern corner of the Netherlands (at the border with Germany and Belgium). The name *Parkstad* literally translated means Parkcity, which summarizes in one word the two sides of the identity of the region: a green region with hills but also one of the most urbanized regions in the Netherlands. Parkstad Limburg is a collaboration between seven municipalities (Heerlen, Kerkrade, Landgraaf, Brunssum, Simpelveld, Voerendaal and Onderbanken). Since 1999, they have worked together to improve public services, transport and housing on a regional level.



Map 62 Population potentials in the region

Parkstad is chosen as an Inner Periphery case study as it is a 'shrinkage region' with a strong population decline. The decline was triggered by the dismantling of coal mining, the region's main economic activity. Parkstad Limburg is not less accessible than other neighbouring areas. While travel to Amsterdam or The Hague takes about three hours, a trip to Brussels or Cologne only takes one hour. Cities like Liege, Genk, and Hasselt are reachable within half an hour, and Aachen is very close to the border of

Parkstad Limburg. Nor are indicators as unemployment rates or population potentials significantly worse than for neighbouring areas. Therefore, it is not possible to define Parkstad as an Inner Periphery on the basis of static indicators; instead, dynamic developments have to be considered.

Economic structure: From 1900, coal mines (both state-owned and private) became the main employer of the region. The mines of South Limburg supplied the national demand for coal and became an essential part of the Dutch economy. Industrialisation led to rapid urbanisation in the mining region, with settlements being established near to the mines. These so-called mine colonies provided housing for the miners and grew into tightly-knit communities with close ties to the specific mines. This resulted in a substantial fragmentation of both industrial and residential settlements, not only in the Dutch mining region, but also in nearby regions in Germany and Belgium. Effectively, a densely populated zone of industrial and mining activities straddled the borders of all three countries.

Due to the rise of fuel oil, gas and other hydrocarbons, the coal mining industry became less profitable. The state mines started to make massive losses. Between 1966 and 1973, all of the region's mines were closed. About 45,000 people lost their jobs and the region's mono-sectoral economy lost its major motor (De Graaf, 2005).

One element of the 1970s national policy on regional development was to establish major employers in the region to compensate for the loss of the mines. Factories opened their doors. Despite these top-down initiatives to create new jobs, the regional economy never fully recovered, and employment, once one of the region's assets, abruptly ended, and emigration started to exceed immigration (Smeulders & Latten 2009). Lack of economic diversity severely limited recovery from the loss of the main economic motor.

This former international mining zone is now promoted as the 'Green Metropolis', with cross-border cycling routes and information boards about the history of the region at the roadsides. However, this vision of Parkstad as a provider of green areas and leisure services for neighbouring metropolitan areas has only partly been achieved, since it is one of the most urbanised areas of the Netherlands. Even though Parkstad claims to be the "fastest growing tourist destination in the Netherlands", this does not seem to compensate for the continuous industrial decline.

Demography: The Dutch Central Statistical Office (CBS) and the Netherlands Environmental Assessment Agency (PBL) predict that, of the population of 238,684 on 1 January 2008 (Parkstadmonitor 2010),

Parkstad Limburg will lose about 15,000 inhabitants by 2025 (De Jong & Van Duin 2010).

Ageing is a significant issue: in 2005, the Dutch national average of senior citizens (> 65 years) in the population was 14.0% (CBS StatLine 2010), compared to which the province of Limburg (15.9%), South Limburg (17.0%) and Parkstad Limburg (22.0%) have much higher percentages.

Due to the lack of highly qualified jobs, a rising number of young people leave the region to find a job matching their level of education. People who left the region for educational purposes often do not return.

Impact of the border: Parkstad Limburg is peripheral in the Dutch context, but in the context of the Euregio, it is central. The Euregio is composed of four different cultural regions (Dutch, German, Flemish and Wallonian). Cross-border economic cooperation faces barriers in language and legislation.

As a result of differences in national fiscal policies in the Euregio, such as the possibility to maintain mortgage deductibility, it is beneficial to buy a house in Germany or Belgium rather than the Netherlands. This has resulted in thousands of people moving to Germany or Belgium because of lower real estate taxes (Das & De Feijter, 2009). On the other hand, it is expected that the growth of the RWTH University in Aachen, identified as one of Germany's international elite universities, creates an opportunity to attract people from Germany to Parkstad Limburg because Aachen is facing its spatial limits to expansion.

Identity: As a result of the fragmented mining settlements, every settlement formed a community on its own, which encouraged micro-chauvinism and feelings of regional competition between these communities. This is a crucial contextual factor in local politics and regional collaboration. In addition, the strong separation of local identities is enforced by the many existing dialects, with clear differences in language.

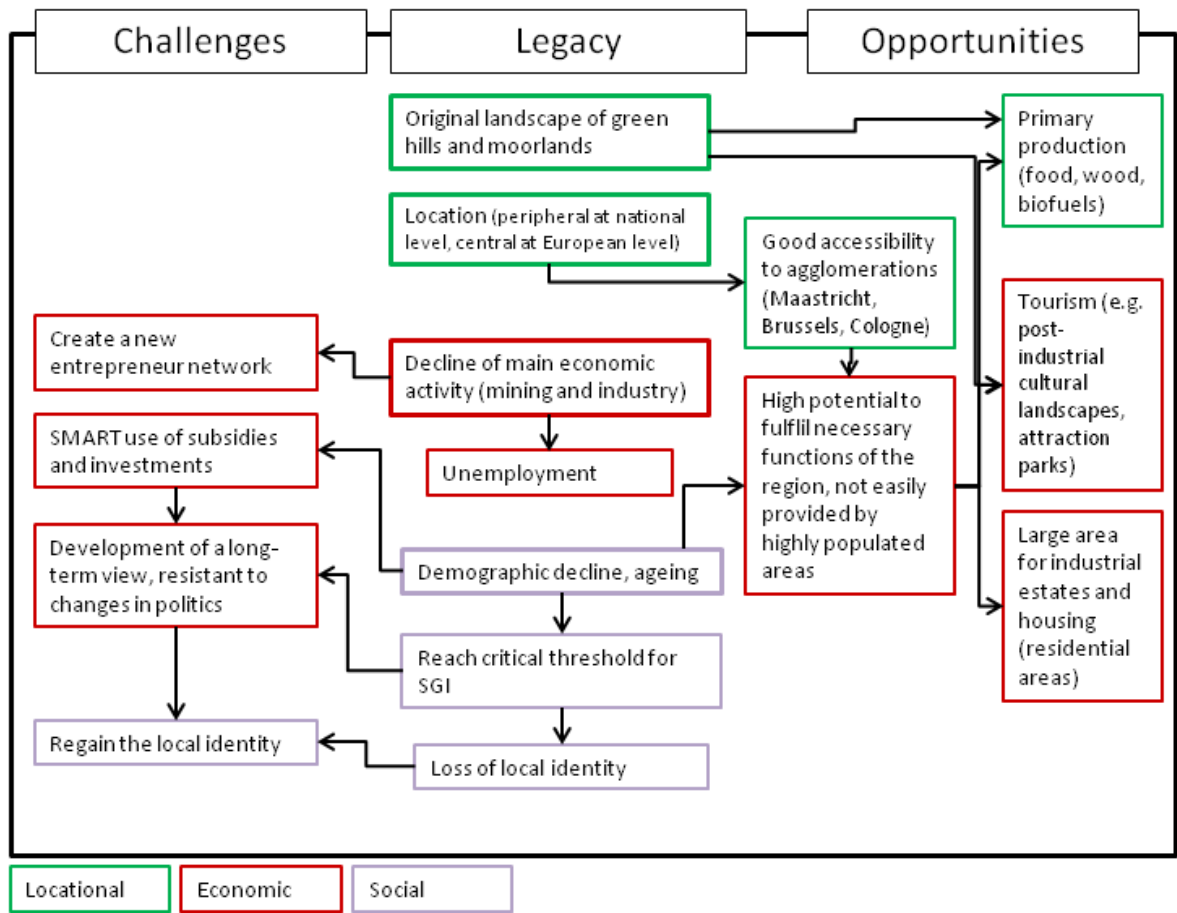


Figure 52 Parkstad: nexus of development factors

5.2.7. Outermost regions: Case study reports

Canary Islands

Spain's Canary Islands form an archipelago of 13 islands, located 100 kilometres off the Moroccan coast and close to the Equator. They share volcanic origins and a generally subtropical climate. Mount Teide on Tenerife (3,718 m) is Spain's highest summit and the third tallest volcano in the world. The Canary Islands are a Spanish Autonomous Community led by an independent regional government (Gobierno de Canarias). Each of the seven major islands is ruled by an island council (Cabildo Insular). With a population of 2,117,519 in 2011, the Canary Islands are the eighth most populous of Spain's autonomous communities, with a theoretical density of 282.6 inhabitants per km². Effective density is, however, much higher since the two islands of Tenerife and Gran Canaria alone host over 80% of the total Canarian population and, due to the mountainous nature of both islands, inhabitants are concentrated in coastal areas.



Figure 53 Map of the Canary Islands

Tourism: The islands' great natural attractions (Teide National Park is Spain's most visited national park), climate and beaches make the islands a major tourist destination, visited each year by about 10 million people. The economy is based primarily on tourism, which makes up 32% of the GDP, and more generally on services. As a result, the Canary Islands are the most developed Outermost Region.

However, the extensive development of tourism, by increasing the land pressure already exerted by long-term residents, has generated various problems in terms of land planning and environmental protection. To address the difficulties caused by excessive numbers of tourists, the Canary Islands Government has taken the first step by laying down a tourism moratorium



limiting the construction of new accommodation units. However, given the illegal construction of hotels and other development projects in protected areas, it appears that such problems are not yet solved.

These elements have, over time, downgraded the very image of tourism in the Canary Islands: the destination is increasingly perceived as a mass tourism destination that attracts more and more “low-cost” type clients, thereby not encouraging a reorientation towards a higher quality type of tourism.

Production costs (industry): The small size of the market and its fragmentation hamper economies of scale: infrastructures and teams are necessarily limited in size, if not dispersed throughout the archipelago, and can barely reach the minimal scale needed for efficiency. As a consequence, productive equipment is generally oversized, contributing to very high average production costs and limiting strategic options in terms of diversification, specialisation, etc.

Market characteristics (limited size and fragmentation again) are also a challenge in terms of human resources. Wages are much lower on average than in continental Spain, but qualified workers are rare; employers can hire well-trained workers from continental Spain (but at higher wages) or themselves launch training programmes (which is costly and reduces productivity). Mobility issues between islands further increase this problem of access to qualified workers.

Other production costs are also impacted by the region’s characteristics. Companies need to stock more than their continental counterparts in order to face potential supply problems, but free space is rare and expensive. Water and energy generation and distribution are major issues in the archipelago, as is waste management.

Finally, remoteness from economic and political centres such as Madrid and Barcelona necessitate frequent trips to continental Spain for Canarians, etc. (LL&A and ULB, 2006).

As a consequence, industry plays only a limited role, and the Canary Islands strongly depend on imported goods.

Transport: The remoteness and fragmentation of the archipelago create particular challenges for transport. There are six international airports, mainly serving EU destinations. *Inter-insular* connections are mostly maritime for merchandise, mostly aerial for passengers. The only existing means of *inner-island* transportation are highways and roads. Apart from Fuerteventura and Lanzarote, 80% of the Canarian territory is steeply sloping (in average, the gradient exceeds 20%). This requires winding roads, which in turn imply higher fuel consumption, pollution, and maintenance costs.

Services of general interest: health: Most infrastructure (health centres, practices, emergency services) is concentrated on Gran Canaria and Tenerife, where most inhabitants (and visitors) are concentrated. There are no emergency services on the islands of El Hierro, Fuerteventura and La Gomera, where the proportion of the population that has needed hospitalisation has dramatically increased over the past five years. In absolute numbers, this represents a limited number of persons, but it means that specialised transportation services, including emergency transportation services, are needed to transfer inhabitants from these isolated areas to the two main islands. This has a cost, in addition to that of maintaining numerous health centres across the islands. Telemedicine solutions are being tested for some health issues, to reduce the need for patients to travel to another island for specialist care.

Demography: All islands show a positive migration balance. The age of migrating cohorts, depending on their origin, is an excellent indicator of the reasons why the Canary Islands gain or lose inhabitants. Most emigrants are young adults (between 25 and 39 years old) or older adults (40-59), but clearly from the economically active cohorts, probably in search of jobs. Immigrants belong to all age cohorts, especially the 25-39 cohort, which compensates departures in the population of that age. There is a clear difference in profile between migrants coming from EU and non-EU countries: the former are essentially mature or retired adults who either buy secondary homes in the Canary Islands or choose the archipelago as their main residence; the latter are, on average, much younger (less than 30 years old) and come for employment.

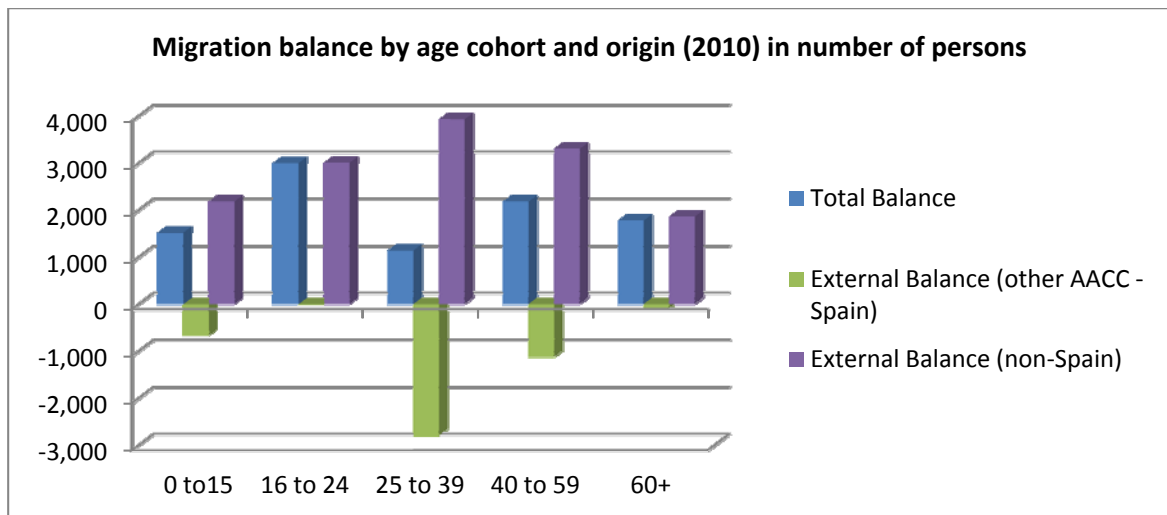


Figure 54 Migration balance in the Canary Islands

Most irregular migrants arrive in the Canary Islands with tourist visas, and then stay beyond the permitted residence period. Migrants arriving by boat from the West African coasts represent a very small proportion of the population illegally residing in the archipelago (Godenau, 2008). This is estimated at a maximum of 5%, but the phenomenon has gained specific attention in the media and among political authorities at various levels, and has led to the Operation Hera II under the umbrella of the European Frontex agency.

Generally, relations with African neighbours are increasing, with growing exports, and the formation of linkages between institutions and universities.

Biodiversity and protected areas: The location of the Canary Islands, less than 100 km from Africa, their multiple climatic influences and thus micro-climates, as well as the territory's fragmentation make it a place of invaluable interest in terms of biodiversity (fauna and flora). The island of Gran Canaria, for example, hosts half of the species that are unique to Spain. The Canary Islands are extensively protected: 42% of the total land area is designated for conservation.

The protection of biodiversity is sometimes linked to conflicts with projects for economic development. In 2009, for instance, a major economic project worth 380M€ (the construction of a giant industrial port in Granadilla, Tenerife) was stopped by a regional court because it endangered beds of protected seaweed located nearby. In this context, the fact that UNESCO declared the entirety of the islands of El Hierro, La Palma and Fuerteventura as "Biosphere Reserves" under its 'Man and

Biosphere' programme in 2000 is notable, as such sites should be key locations for balancing conservation and development.

Access to resources: Energy is of key interest in the Canary Islands, which relies on six large autonomous electrical grids. Except for a submarine cable of limited capacity between Lanzarote and Fuerteventura, there are no connections between islands or with the continent. Since there are no conventional energy sources on the islands, all electricity must be generated on the archipelago. Given these characteristics and the high energy demand deriving from tourism, the local government has adopted a policy of energy self-sufficiency. Renewable energy resources must hence be developed, particularly wind and solar.

Desalination plants supply most water. As this requires large amounts of energy, which is difficult to produce and distribute, water prices are very high.

Overall: The Canary Islands show some of the typical characteristics, such as remoteness from the European continent and small market size, of the Outermost Regions of the EU. These characteristics create handicaps of several types for the territory, particularly additional costs for entrepreneurs as well as in the provision of public services.

However, when one looks in more detail into the Canarian situation, it appears that the territory's main characteristics stem from the fact that it is (i) an ecologically rich seven-island archipelago and (ii) a Spanish Autonomous Community that has followed the country's major development trends.

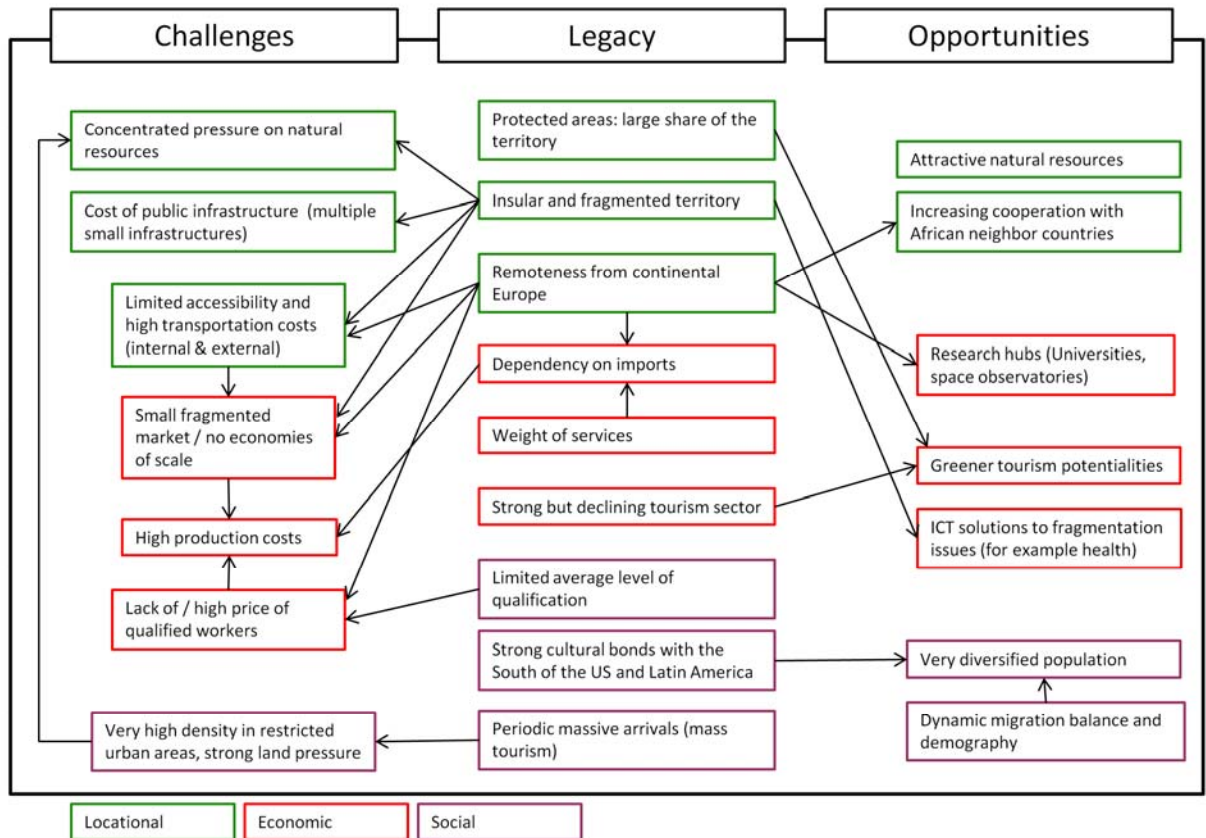


Figure 55 Canary Islands nexus model

French Guiana

French Guiana is an Outermost Region of France, located on the northern Atlantic coast of South America. With an area of 83,846 km² and 232,223 inhabitants (but a dynamic average annual demographic growth of +4% over the last decade), the territory's population density is very low (2.8 people/km²). The region consists of two main geographical areas: a coastal strip where the majority of the people live, and a dense, nearly inaccessible rainforest which covers 96% of the territory. French Guiana became a "département" of France in 1946; it was given a regional status in 1974.



Figure 56 Map of French Guyana

Economic structure: The region's GDP per capita (€14,100 PPP in 2008) is the lowest of the French regions and also of the Outermost Regions. The economy is closely tied to that of France through subsidies and imports. Besides the French space centre at Kourou, construction and services (public and private) are the most important economic activities. The cultivation of crops is limited to the coastal area, where the population is largely concentrated; rice and manioc are the major crops. French Guiana is heavily dependent on imports of food and energy. Unemployment is a serious problem (over 20%), particularly among younger people.

Particularities of the economic structure are the strong weight of the public sector (44% of the total employees), and the strong relative weight of the construction and agriculture sectors. Industry appears to be quite strong in French Guiana in comparison to other French Outermost Regions, but it essentially relies on the aerospace sector.

The French space agency CNES set up a base in French Guiana in the 1960s, due to its position (open to the Atlantic and to the North, proximity to the Equator, large surface area, sheltered from cyclones and not vulnerable to earthquakes). Following the success of Ariane, space activity became very important in this region. In the 1990s, the sector accounted for more than 25% of the GDP (but has decreased since).

With regard to the rest of the economy, it appears that many sectors, such as agriculture, fisheries, gold mining, and forestry and wood

processing, have reached development limits because of a lack of modernization and illegal practices.

The specificities of French Guiana's economic and geographical patterns have a great impact on the spatial distribution of economic activity. The urban area around Cayenne, the main city, concentrates three-quarters of the salaried jobs – half of which are related to the public sector.

Unemployment and illegal immigration have contributed to the development of an informal economy and of moonlight work. In 2006, 4,000 Guianese declared having an informal job (people called "les jobeurs"), which represents 9% of total employment and 14% of employment in the private sector.

There is a recurrent debate concerning involvement in regional activities and cooperation with neighbouring countries, but both are still ineffective. Involvement in regional activities faces barriers at different levels:

- Legal: as an Outermost Region of the EU, French Guiana is also part of the Common Market, and shares EU standards and rules for the circulation of people, goods and services. No such thing exists at the Amazonian scale (Guyana Shield¹⁶¹). French Guiana is equally subject to European trade agreements and tariffs;
- Economic: The Guyana Shield cannot be considered as an economic area as regards flows of goods and services. Several economic barriers can be identified for French Guiana, such as the lack of competitiveness of French Guiana's companies (mostly microenterprises) and low income and solvency problems on the other side (Para and Amapa are among the Brazil's poorest States) ;
- Political: Because of institutional arrangements (French Guiana is a region), local policy-makers have limited power in terms of international relations. No agreements can be signed without the supervision and approval from the national government. The national authorities often liaise directly with Brazilian authorities without any form of consultation with regional stakeholders.

Tourism: In contrast to other Outermost Regions, tourism in French Guiana is not a traditional sector. Given the geographic features (climate, limited number of beaches, etc.) and the high prices (transport, food, etc.), French Guiana cannot compete with other Outermost Regions or neighbouring areas in terms of seaside tourism. The few cultural and

¹⁶¹ The Guiana Shield is a 1.7 billion year old Precambrian geological formation in northeast South America that forms a portion of the northern coast. It underlies Guyana, Suriname and French Guiana, as well as parts of Colombia, Venezuela and Brazil.

historic attractions (space centre, penal colony, carnival, etc.) are not sufficient to constitute a major touristic asset.

Transport: Maritime and air transport are the main transport modes for external flows. Maritime freight transportation costs are very high (30 to 50% higher than in other Outermost Regions), as a result of several factors: the low volume of exports (only 10% of the containers leave French Guiana filled with merchandise); the inadequacy of port infrastructure; the level of labour costs; and limited competition between operators. More specifically, the port of Degrad des Cannes, located on the estuary of the river Mahury, is not deep enough to accommodate big ships. Hence, transshipment from container ships to coasters is often required. This operation takes place in Trinidad and Tobago.



Access to the internal areas is difficult because of the separation between the coastal and forest areas. Access to the forest is only possible by air or river. This increases the cost of access to primary resources (wood, plants and fruits, gold, etc.), of transport to the final clients, and delivery costs for basic public services. Travel from Maripasoula

from Saint-Laurent on the Maroni river takes two to three days, depending on the season, but only 1 hour and 10 minutes from Cayenne with a light turboprop aircraft.

A railway track, built by slaves, has been effective in the past but no longer functions. Feasibility and profitability studies argue that such a transport mode could not be viable.

Information and Communication Technologies: Regarding telecommunications, French Guiana is linked to the rest of the world by only one cable, AMERICAS II, which crosses the Atlantic. Thus, an e-mail sent from Guiana to Guiana passes through the French mainland. This leads to severe congestion. In addition, due to the topography of the region, it is difficult and costly to provide the forest area with Internet access. As a result, the broadband penetration rate is very low, with striking disparities between different areas.

The penetration rate of mobile communications is very high. Since the standard phone network underdeveloped until the 1990s, telecom companies have invested directly in cellular networks. Also, a significant

part of the population lives in illegal constructions and therefore, does not ask for a landline but uses cell phones.

French Guiana is a leader in the field of ICT applied to public health. These techniques were initially developed to meet astronauts' health needs. They now make it possible for doctors to diagnose and care for patients at a distance thanks to satellite communications, using the CNES portable telemedicine station. Over 34,000 teleconsultations have been carried out since 2001. In addition to ensuring rapidity and reliability of diagnosis, this can avoid costly and stressful medical evacuation for isolated patients.

Demography: Dynamic demographic growth is French Guiana's main feature: it had only 27,000 inhabitants in 1950 and now has over 230,000. Demographic growth is mainly due to a high birth rate, the second reason being immigration. This situation is rather unusual among Outermost Regions and in Europe in general (except for Mayotte which shows similar characteristics). The high fertility rate (3.49) can be explained at least partially by cultural and sociological factors. A considerable proportion of the Guianese population is composed of foreigners or children of immigrants, mainly from Suriname and Haiti. In addition, given the sanitary, healthcare, and welfare situations on both sides of the border, many Surinamese women come to French Guiana to give birth.

As a result of this demographic dynamic, the proportion of young people (under 20) is very high. Unemployment and education are therefore pressing issues. Massive investments in human capital have been undertaken in recent years to improve education, training and qualification levels. However, only 36% of the population aged 15 to 29 are registered in the education system. This means that a significant part of the youth is very difficult to reach through standard policy actions.

Immigration is an important phenomenon, partly due to political turmoil in some of the neighbouring countries, but also because of gold. It is estimated that over 10,000 immigrants are working in illegal gold mining camps. Other informal exchanges include drug and gun traffic. Border control is very active, with ten to twelve thousand people in irregular situations arrested each year. Lack of cooperation with the authorities of neighbouring states has been underlined by several observers.

Identity: French Guiana's population is characterised by the presence of native Amerindians, as well as by a succession of immigration waves (mainly on voluntary grounds). These factors shaped a diverse and complex social structure. Today, about 7,000 Amerindians live in French

Guiana, most of them in the National Park. Although they are authorized to live, hunt, fish and build houses in the protected areas, they have no property rights. This makes them dependent on decisions taken by public authorities. They have the status of French citizens but cannot always enjoy access to services considered as basic in other areas

(drinkable water, healthcare, polling station, etc.).



Visit of French President Sarkozy in Camopi, 2008 © Wojazer/AFP

The Creole culture is by far the most prominent feature of Guiana's society. It is a mix between Caribbean identity and Latin American influence, but with French cultural influences (although it historically developed in opposition to the French / white culture). History also shapes society in other ways. For instance, labour unions, as in the French Antilles, are very strong and pugnacious, and regularly use a rhetoric based on these regions' colonial past.

Biodiversity: The level of biodiversity is among world's highest, in terms of both flora and fauna, particularly because of the presence of primary forests. 5,500 plant species have been recorded, including more than 1,000 tree species, along with 700 species of birds, 177 species of mammals, over 500 fish species, of which 45% are endemic, and 109 species of amphibians. French Guiana hosts some famous endangered species as black caimans, pumas and jaguars, leatherback sea turtles, aras, red-faced spider monkeys.

The Guiana Amazonian Park is one of France's nine national parks. It is the largest national park in France and the European Union, and one of the largest in the world.

The high biodiversity attracts researchers, and issues of genetic patenting have been raised by some stakeholders. For example, whereas it is now impossible to collect natural species samples in Brazil without permission (and without paying a set fee), no such ban exists in French Guiana. As a consequence, numerous researchers come to the region in search of new natural extracts, and leave with samples without even informing local scientists and authorities. In terms of both control and valorisation, this situation is deemed problematic.

Renewable energies: The geographical position and characteristics of French Guiana mean that it cannot be connected to European energy markets or neighbouring countries' energy networks (which in any case do

not even cover their own needs). Due to geographical constraints, especially the inaccessibility of the forest area, one cannot even speak of a single energy market at the 'regional' level. Indeed, 12 communal areas out of 22 are not connected to the Guianese network and are consequently heavily dependent on fossil fuels.

A total of 60% of the electricity comes from hydro-electric plants (115 MW) and there is still potential to produce more hydro-electricity. In addition, solar energy (photovoltaic) could be developed to meet the needs of the population in isolated areas. A third promising source of energy is biomass, as a result of forest exploitation. Currently, about 2 MW per year is produced from biomass derived from sawmill waste; although extensive fuelwood resources exist, their value is not being fully realised.

All these projects are however threatened by the very recent prospects of oil resources. The company "Tullow Oil" claims to have made an "important new oil find" in an untapped region off the coast of French Guiana.

Nexus model: French Guyana

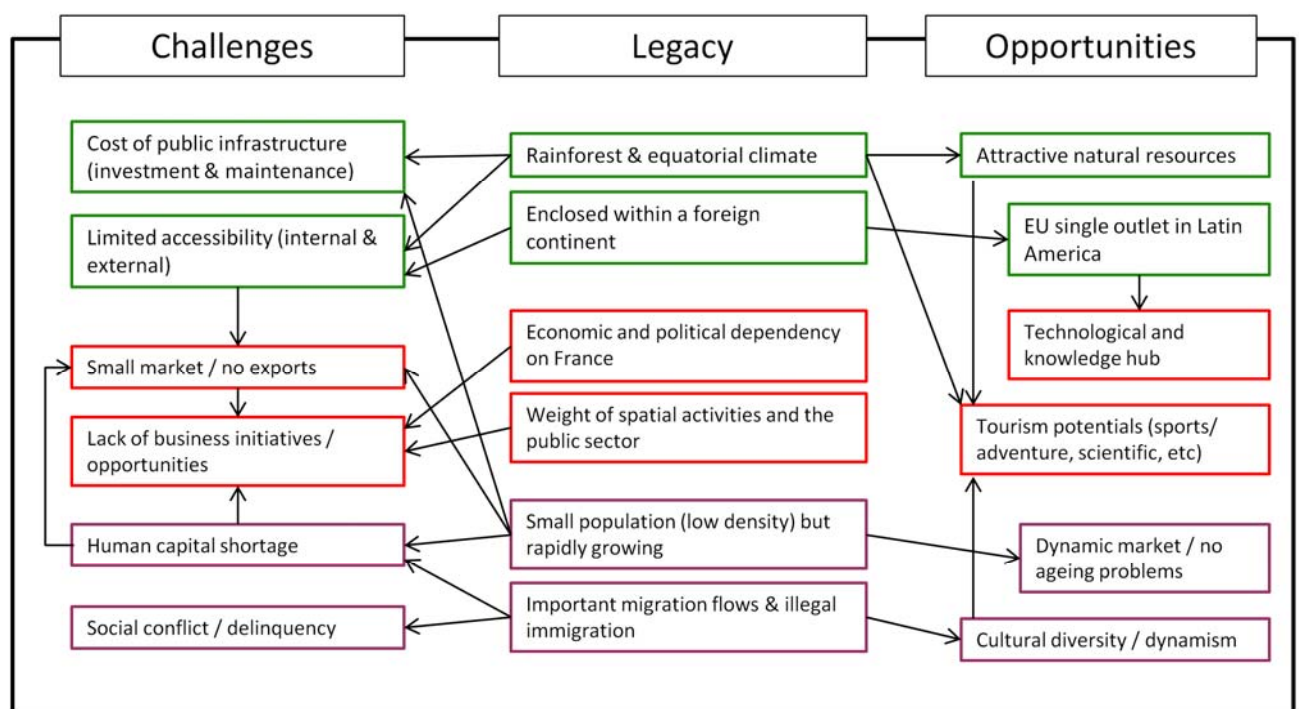


Figure 57 French Guyana nexus model

5.3 Synthesis of findings from case studies

When characterizing the case study areas, it becomes obvious that all are searching for the right path to development – and this almost exclusively refers to economic development, i.e. the generation of (economic) value. However, the discourse varies. For many areas, discussions centre strongly on the area's handicaps or challenges, which should be *compensated for* by policies, in order for the area to be able to exploit its full potential. In other areas, the focus is more on assets or opportunities, which should be *promoted*. A third perspective – although less frequently voiced in ongoing discussions about Structural Funds, regional competitiveness and “headline goals” – is that of overarching values which are less easily quantifiable.

The common question is of course: What can policy do - which levers can be applied – to aid these areas in their path towards development?

The tables in the Annex attempt to give an overview of these elements for each case study area. The case studies were prepared to evaluate how geographic specificities influence development paths. The table should be read with this in mind: it focuses on development challenges and opportunities *deriving from geographic specificity* and is thus not a complete SWOT analysis. In addition, as the case studies focussed on a limited number of transversal themes, not every possible issue is included.

The first two columns present elements of the case study areas where a lever could be applied to *compensate for* challenges or to *promote* assets. As argued in the chapter on policy options, much of the debate so far has concentrated on how GEOSPECS areas can be compensated for their “structural handicaps”, with a view to “levelling the playing field” for these areas. However, when arguing for a level playing field, the underlying assumption is that all regions in Europe should be moving towards the same objective, namely *competitiveness* (in any way, shape or form). On the one hand, this raises the question whether the concept of competitiveness can be applied to regions *at all*,¹⁶² and on the other hand if it is a useful approach. GEOSPECS argues that this is the wrong approach. Policy-makers should be reluctant to imitate a successful model that has

¹⁶² see, for instance: Boschma, R. A. (2004). Competitiveness of Regions from an Evolutionary Perspective. *Regional Studies*, 38(9), pp. 1001-1014.

its origin in a different environment without accounting for region-specific contexts. A successful model relies on a number of interdependencies between different factors. Instead of proclaiming common objectives for every region (and accordingly benchmark everyone against the common average), it would be necessary to seek to identify how regional resources can help generate a more robust internal economy, and on this basis increase the sustainability of local communities. Instead of generally compensating for any perceived disadvantage, it would then be necessary to counteract only those disadvantages that prevent the region from exploiting its full potential.

The third column is here entitled “non-commodified values”. The phrasing stems from an attempt to expand the concept of “ecosystem services”. Ecosystem services are the benefits people obtain from ecosystems, which are quite frequently not quantified in economic terms, as very few are traded on the market. In this context, the concept shall refer to something broader than only services from ecosystems, as ecosystems are usually associated with ecology or the *natural* environment (although this is not strictly speaking true¹⁶³). Here, “non-commodified values” is deemed to mean *any value that does not normally receive market-pricing*. The column could equally have been termed “positive externalities”, “public goods” or even “global commons”.

Nevertheless, attempts have been made to quantify such non-market values in economic terms, and there is a growing literature concerned with the pricing of ecosystem services. This exercise inevitably runs into moral snares, since the sum of value of all ecosystem services of the planet is necessarily infinite (as all humans are part of ecosystems, we would not exist without them).

This column intends to broaden the debate, with view to a more long-term perspective. While ongoing political discussions are typically reduced to the immediate generation of monetary value (growth), many elements (assets) of an area have an intrinsic value, which deserves to be maintained for future generations, even if it does not generate immediate added value. These resources (in the widest sense of the word) will be the basis for life for future generations, but also enrich people’s lives today (by creating culture, recreation, health and other values). A region with a comparatively low GDP can thus create a wide range of other values. If the true value of natural capital were taken into account (an approach

¹⁶³ The Oxford Dictionary defines “ecosystem” as “a biological community of interacting organisms and their physical environment” – it can thus easily include humans, man-made structures, cultural interactions, etc

that is referred to as “ecological economics”), many GEOSPECS areas might be able to offer much more than agglomerations, which are the classical nodes of competitiveness. In an ever more densely populated world, putting ever more pressure on the natural environment, these aspects deserve consideration, and are being gradually factored into political debates.

It should be noted that the column deliberately leaves out (ecosystem) services that would be common to *all* of these areas. For instance, photosynthesis, air purification, carbon sequestration, soil stabilization, nutrient cycling and pollination can be expected of *any* terrestrial ecosystem, hence a listing for each case study area would be redundant. A ranking of the *extent* to which each case study area provides these services could be created; however, this exercise would require a quantification and go far beyond the scope of this project. Hence the focus is on values/services that are specific to that case study area. More generally, there are some ecosystem services that are exclusive to geographically specific areas. Examples are mountains which play a key role in the water cycle for Europe as a whole, or coasts which provide particular food resources like fish. A more detailed analysis of these specific services can be found in the chapter on transversal themes, more specifically “Biodiversity and protected areas as factors of development”.

The Annex contains a summary of all case studies according to this model. For reasons of space, only one example (of the Highland Council area) is reproduced here. Typically, the model would contain elements such as:

Compensation of constraints:

- Low diversification of economy / dependence on public sector (Outer Hebrides)
- Access to island time-consuming & costly (Sicily)
- Services of general interest are provided at lower levels (higher costs per head due to low population densities and long distances) (Tornedalen)
- Small size does not attract investment (sparsely populated areas in Spain)
- Environmental degradation due to overdevelopment of the coast by tourist structures (Belgian coast)
- Ageing society / high share of elderly (Irish Sea)
- Dependency on imported products / higher costs (Canary Islands)

Promotion of assets:

- High living quality (natural capital, strong sense of identity, close-knit communities, particular traditions) (Outer Hebrides)
- Attractive area for tourists, brand as "sea and sun" destination (Sicily)
- Availability of natural resources (Tornedalen)
- Potential for renewable energy exploitation (Belgian coast)
- Multicultural society (Geneva CBMR)
- Building relations with African neighbours: trade increasing (Canary Islands)
- Permeable border makes daily commuting easy (Jura massif)

Non-commodified values:

- Ecological richness (French Guyana)
- Potential for exploiting renewable energy sources: direct use value + option value (Outer Hebrides)
- Recreation value hinging on activities particular to coasts (swimming, boating...) and unique landscape (Irish Sea)
- Interface (melting pot) for many cultures (Sicily)
- Living area of the only indigenous people of the EU (Tornedalen)
- Resources of worldwide importance (forests, iron, construction materials) (sparsely populated areas of Spain)
- Regeneration of a resource: Belgian North Sea as an important spawning and nursery ground for some commercial fish species (Belgian coast)
- Gateway between EU and non-EU countries (Polish-Ukrainian border)

Table 33 Example: Highland Council area

	Levelling the playing field (Compensation of constraints)	Enhancing endogenous development (Promotion of assets)	Non-commodified values
Economic structure	<p>Low diversification of economy / dependence on tourism & public sector</p> <p>Long travel times (due to dispersed settlements and terrain) - deters new enterprises makes some goods more expensive</p> <p>Services of general interest are provided at lower levels (higher costs per head due to low population densities and long distances)</p>	<p>Attractive area for tourists (unique landscapes + outdoor activity opportunities + Highland image)</p>	<p>Recreation value hinging on</p> <ul style="list-style-type: none"> - unique landscape + outdoor activities - cultural elements
Society	<p>Ageing society (due to immigration of old & outmigration of young)</p> <p>High house prices (due to influx of older people) are sometimes unaffordable for younger</p>	<p>Attractive area for residents (living quality due to quality of environment and close-knit communities)</p>	<p>Unique cultural heritage including specific products (e.g. whisky), garments (e.g. kilts), traditions (e.g. Highland dances), Gaelic language + strong sense of identity: <i>cultural value + heritage value</i></p>
Environment	<p>Lack of grid capacity may hinder efficient exploitation of renewable energies</p>	<p>Potential for renewable energy: wave & tidal, wind (offshore & onshore), hydro</p>	<p>High levels of biodiversity supported by Highland landscape: <i>preservation value / intrinsic value</i></p> <p>Potential for exploiting renewable energy sources: <i>direct use value + option value</i></p>

When looking at the tables, it becomes obvious that this approach works better for some geographic specificities than for others. When discussing the compensation of natural handicaps (or constraints), the promotion of assets and non-commodified values makes sense particularly for islands, in mountains, sparsely populated areas and Outermost Regions. A discourse of compensation has for a long time surrounded these areas, and elements of this discourse have been evoked throughout this report. Particularly typical examples are difficulties of access, low levels of public services in sparsely populated areas, the dependence of Outermost Regions on imports due to their remoteness and small market size, or the difficulties that mountain farmers face as compared to lowland farmers. In order to achieve territorial justice, many have claimed that these areas should receive compensation of some form (monetary or exemption from particular regulations). To counterbalance this “negative” discourse, the assets of these areas are then sometimes evoked (as an opportunity for development and GDP growth), or, perhaps more abstractly, the vital contributions that these areas make to the general well-being of humanity as a whole (the non-market values that are often related to the preservation of natural capital).

However, this type of discourse is less pertinent for other GEOSPECS categories, namely border areas and coasts. The underlying assumption of the logic of “compensation” is that all – or at least most – of the respective areas face the same challenges, because the challenges are *structural*: in the case of islands, mountains and Outermost Regions they derive from geographic preconditions, whereas in the case of sparsely populated areas the challenges are inherent in the definition of “sparsely populated”, as the logic of a market economy makes it inevitable that levels of service provision will be lower.

This is not true for borders or coasts. As the case studies prove, both of these GEOSPECS categories are very diverse, and some of the richest and most attractive areas of Europe are borders or coasts. The Luxembourg cross-border metropolitan region features the highest GDP per capita levels of the entire EU, and the Belgian coast is a successful node for transport and logistics, as well as an attractive and thus densely populated living space.

Even though these areas certainly face *challenges*, which policymakers need to address, these challenges do not follow the logic of *compensation for a structural handicap*. For instance, the Belgian coast faces severe environmental degradation due to the impacts of intense anthropogenic activity. Fish stocks in the Irish Sea are depleting. Soaring house prices in Luxembourg and Geneva lead to exclusion of those unable to afford them.

The challenges of the border area between Germany, Poland and the Czech Republic are those of an economy in transition. While all of these issues call for political solutions, they are only indirectly linked to the respective area's position at a border or at a coast, and thus the logic of compensation is hard to apply.

Table 34 Example: Geneva CBMR

	Levelling the playing field (Compensation of constraints)	Enhancing endogenous development (Promotion of assets)	Non-commodified values
Economic structure	<p>Competition for space leads to high land/real estate prices</p> <p>Public transport network across border insufficient</p>	<p>International finance centre Concentration of international organizations Research cluster</p> <p>Many opportunities for (well-paid) employment in the canton Geneva (also for residents of surrounding areas) Image of natural charms in combination with historic & architectural assets</p> <p>Projects to improve public transport network</p>	<p>Recreation value hinging on: - landscape - cultural elements</p> <p>Multicultural society: learning process: <i>cultural value</i></p>
Society	<p>Border as a limit for spatial planning: in Geneva city development of housing does not keep up with rapidly increasing population</p> <p>High number of internationals / commuters creates slight exclusionary sentiments among some parts of Genevan population</p>	<p>Strong links between both sides of border via commuters: French areas function as "suburbs" for Geneva city without border being an obstacle</p> <p>International & multilingual environment: creativity</p>	
Environment	<p>Urban sprawl (consumption of natural areas) + high resource use and waste production</p>		

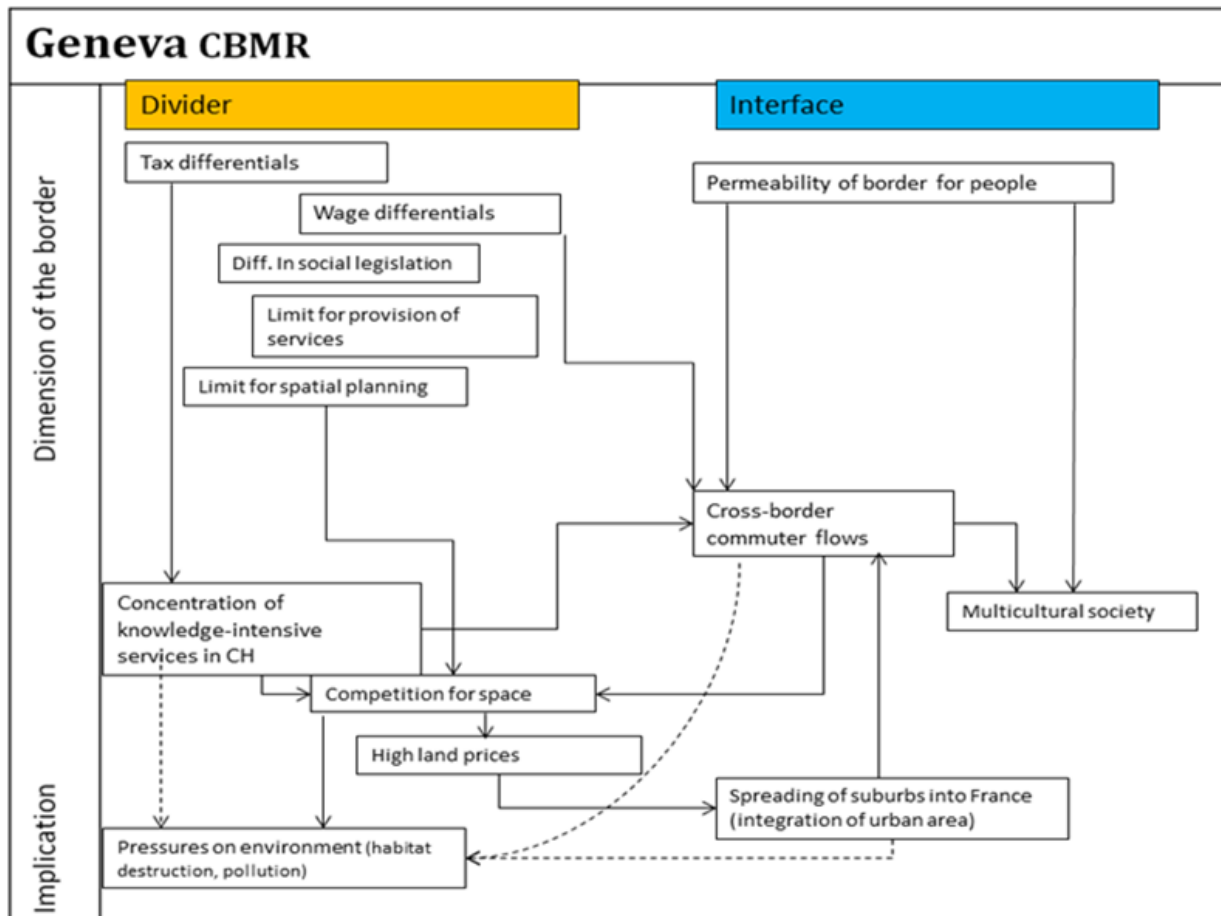


Figure 58 Model of socio-economic processes in areas with a 'linear' geographic specificity: example of the Geneva CBMR

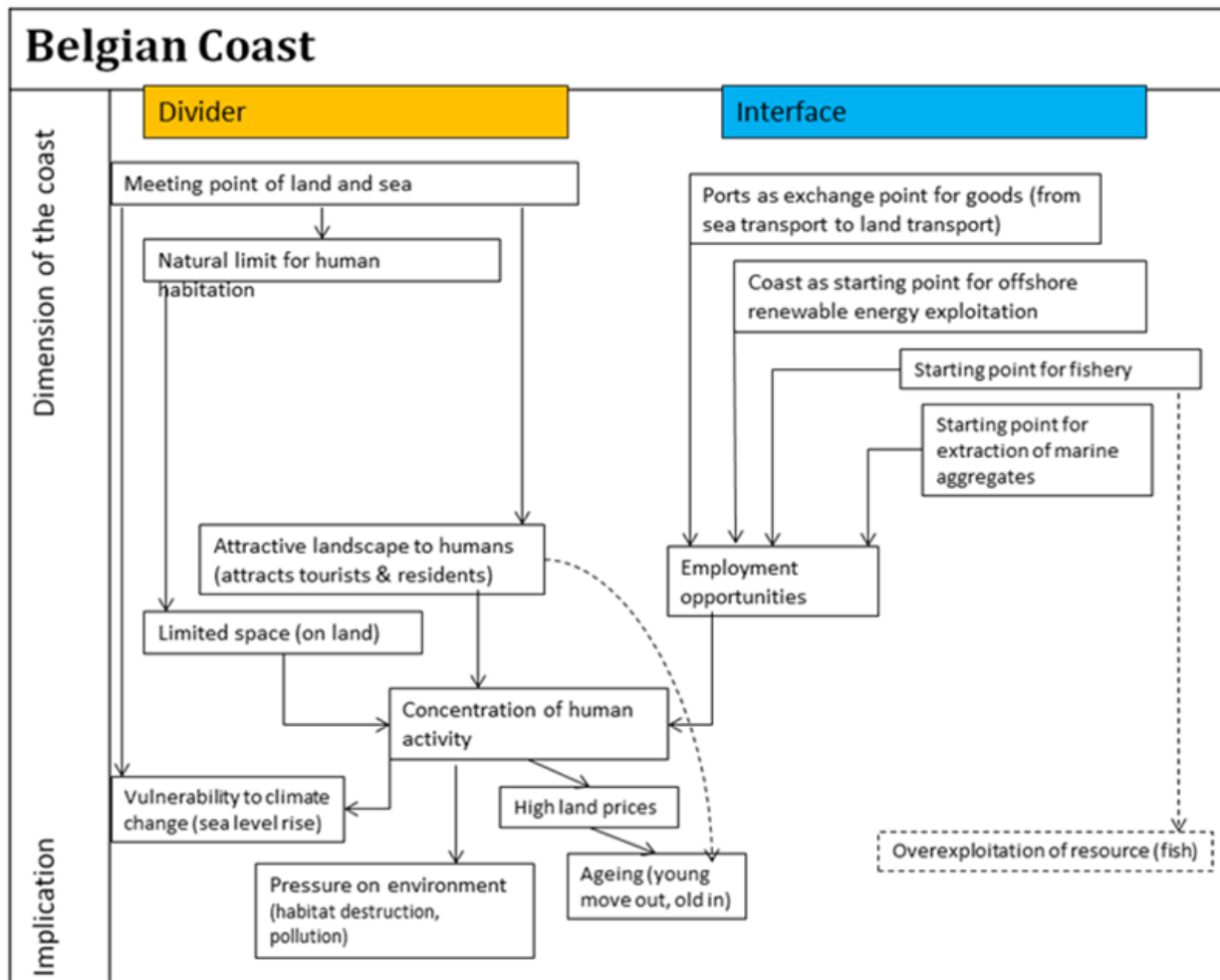


Figure 59 Model of socio-economic processes in areas with a 'linear' geographic specificity: example of the Belgian coast

Instead, a different characteristic appears to unite borders and coasts: conceptually, both can be regarded as *lines* that function as *separators*. The coast obviously separates land from the sea. Borders separate different political administrations with respective rules, different economic spheres with different levels of development, different cultures with different languages, etc. At the same time, these lines have an important role as *interfaces*: economic and cultural exchange takes place across borders; ports on coasts are a focal point for transport, the exchange of goods, and logistics.

GEOSPECS does not regard borders or coasts exclusively as lines, as indicated in the chapter on conceptual understandings and delineations. A coastal *zone* is a strip of variable width measured from the coastline (depending on the type of use for which it is being defined), whereas a border *area* is often characterized as a “buffer zone” where different cultures meet (seeing that lines between different cultures can very rarely be traced sharply). However, both coastal zones and border areas *refer to* a conceptual line.

Overall, it may be more logical to look at borders and coasts in terms of being separators and interfaces. The following are examples for a border region and a coastal region.

6. Transversal themes

6.1 Overview of transversal themes

The cross-analysis of geographic specificities according to transversal themes contributes to a more coherent discourse on geographic specificities, by showing similarities and differences in the ways that regions concerned by each theme experience obstacles to balanced and harmonious development and overcome these challenges.

The TPG has defined transversal themes for the analysis of all types of GEOSPECS areas. The choice of transversal theme makes it possible to cover the strategic ambitions of the European Union of most relevance in the context of GEOSPECS. The purpose of these themes is to establish the basis of a transversal discourse on the relevance of "territorial diversity" in sectoral and territorial policies. The project seeks to identify situations where the adaptation of strategies and measures to the diversity of territorial contexts can improve their efficiency, increase their positive side-effects and/or reduce their negative externalities. It also assesses whether certain GEOSPECS categories are more relevant than others within specific policy fields.

Type of development approach	Transversal theme	Partner name
Economic	Economic vulnerability / robustness facing globalisation	Nordregio, SE
	Accessibility and access to services of general interest	Alterra, NL
	Role of Information and Communication Technologies	Louis Lengrand & associés, FR
Social	Residential attractiveness	E-cubed consultants, MT
	Regional identity and cultural heritage as factors of development	University of Geneva, CH
Environmental	Protected areas and biodiversity as factors of development	Perth College UHI, UK
	Natural resource exploitation	Coastal and Marine Resources Centre, IE
	Vulnerability of human-environment systems to climate change	Umweltbundesamt Österreich, AT

All transversal themes are analysed with the priorities of "Europe 2020" in mind. Within each theme, the TPG therefore seeks to determine how the characteristics of each GEOSPECS category may be of use when formulating and implementing strategies for "smart growth", "sustainable growth", and "inclusive growth". The analysis therefore focuses on the core research question: 'how may the diversity of geographic specificities across Europe be taken into account for multiple development models and ambitions?'

6.2 Transversal theme reports

6.2.1 Economic vulnerability and resilience – Strategies of territories in the face of globalization

Unpacking globalisation

One of the main spatial effects of globalization is what Harvey (1990) identified as the compression of time and space. Globalisation has had a fundamental impact on the perception that distance is not only a fundamental feature of space (physical distance), but also a result of human interactions: i.e., distance is a fundamentally relational notion, which brings in geographical, technological and social aspects (Young, 2010). The major technological advancements have greatly affected the economics of space (Ward and Hite, 1998), by opening up to new opportunities for local economic actors.

The implications for areas with geographic specificities

As explained by Ward and Hite (1998), "rurality and remoteness from markets has generally been defined with respect to a single, central market". Consequently, globalization processes give the opportunity, at least in theory, for non-urban economies to reach out to multiple markets, instead of being 'tied' to a single core market (either regional or national). As local and regional economies in areas with one or more geographic specificities are often remote and marginalised in the national context, globalisation gives them the opportunity to re-connect to other economic spaces beyond the national borders.

Malecki (2007) highlighted this new situation of competition between territories: "Cities and regions compete for investment by companies and by governments, for skilled workers, and for tourists; in all of these competitive situations, one place or a few places are chosen and others are not." He continues by advocating that "the scale of competition may be global (...). Competition is perhaps keenest within the set of 'peers' – places considered similar in size and scope and likely to be attracting investment, skilled workers, and tourists from one another."

Economic Vulnerability and Resilience of territories

Economic vulnerability refers not solely to a structural weakness of a regional or local economy as such, but also to its compatibility with other regional and local economies. Economic vulnerability suggests that the economic characteristic of a territory needs to be contextualised.

Consequently, vulnerability (or robustness by the same token) cannot be considered as an intrinsic characteristic of an economy. Simmie and Martin (2010), proponents of an evolutionary perspective on regional growth, argue that "A local economy with a successful specialisation can become more conservative and thus less resilient in the long term (...) the important attribute of regional economic resilience is the adaptative capacity of a local economy". Thus, regional resilience is tightly related to the capacity of the local economy to engender an 'evolving economic specialisation', meaning that the sector activity in which the local economy is specialised may change over time in order to adapt to the new patterns in global demand.

Local economies embedded in multiple economic spaces

Local economies are included in economic spaces that take multiple forms. The most obvious of these spaces are the national and global ones. These levels are easily identified as they represent the main units of economic policies, rules and regulations. Recent work has highlighted the relevance of the sub-national or regional as an important economic space of belonging for local economies and for understanding growth mechanisms. For instance, Huggins and Williams (2011) state that "the regional dimension is especially interesting as a way to organize initiatives for local economic development, and not the least in the context of a globalized economy".

Yet, more often than not, the 'regional' level is reduced to sub-national administrative units (e.g. NUTS II or III). In the GEOSPECS project, we argue that the notion of geographic specificity facilitates bringing more

territorial coherence to the idea of regional economic spaces that are not based entirely on administrative divisions, but rather on common challenges and development opportunities experienced by a collection of local communities. On this basis, local economies belong to certain territorial ensembles (or 'massifs' if taking a metaphor from mountain areas). We argue that these economic spaces often overlap: an individual local economy can be embedded into, or integrated in, a number of these territorial ensembles. For local economies, an integrated development strategy thus needs to take into account this multiple territorial anchoring.

Recent literature (Audretsch and Keilbach, 2004; Huggins and Williams, 2011) has emphasized the role of geographic spaces in shaping the conditions for economic development, as competitiveness varies across geographic space and as regions develop at different rates, depending on drivers of growth. Consequently, taken as a whole, different territorial ensembles shape different possibilities for development opportunities because they have different economic preconditions and profiles. For local economies, belonging to a number of such territorial ensembles brings a greater variety of development opportunities than if regional economic spaces are only considered as mono-dimensional (i.e. based on administrative units).

Networking and Social Capital

Social capital has been identified as one of the main comparative advantages of non-urban places in the context of globalisation. As expressed by Ward and Hite (1998), "rural areas and small towns tend to pride themselves upon traditional family values and reliance upon informal institutions in interpersonal relations". Social capital represents the internal relational capital of a territory, i.e. the capacity of economic actors to develop and maintain interactions (e.g. kinship or trust). Yet, this strength of local relations is not enough for economic actors to take advantage of development opportunities. As acknowledged by Lowe et al. (1995) and later by Fløysand and Sjøholt (2007) in the context of peripheral regions, the development of extra-local linkages is necessary for local communities, as they will not be able to generate development purely from within. Consequently, for small, isolated communities, tight social capital ought to be combined with openness towards extra-local actors. In the same vein, based on a study of globalization processes in peripheral parts of Canada, Young (2010) summarizes that 'although rural areas may have high levels of strong-tie or 'bonding' social capital. Recent research suggests that these types of connections are less useful than

outside ties in generating new economic and entrepreneurial opportunities”.

For small, isolated local communities, doing business has often meant a “strong reliance upon the local market due to the rural firms’ remoteness from extended markets and limited numbers and density of business networks” (Galloway, Sanders and Deakins, 2011). We advocate that these local economies also need to develop new forms of relational capital that extends outside the traditional local economic territory. We furthermore argue that GEOSPECS areas may form coherent economic spaces within which extra-local economic relations may prosper and develop.

Review of relevant findings from the case studies

In relation to the discussion above, the issue of economic vulnerability and resilience will be explored in the GEOSPECS project according to two main aspects, Specialisation and Diversity, and Networking and Social Capital. The empirical discussion will be structured essentially around the qualitative data gathered in the case study reports. This section highlights notable similarities and differences encountered in those case study reports according to these two aspects.

Specialisation and diversity

Traditionally and historically, economic activities directly related to the geographic specificity of a region have been the engine for regional growth and employment: for coastal areas and islands, fishing and maritime transportation; for mountain areas, summer and winter tourism and energy; for sparsely populated areas, mining, energy and forestry. More specifically, the availability of specific natural resources, either above- or underground, was the founding element that led to early economic specialisation in many GEOSPECS areas.

However, in many cases, the dominance of these traditional activities has been significantly reduced in the recent years. Second, the traditional activities need to reinvent themselves and become more competitive and ‘niched’, in order to develop a specific market aiming at developing a competitive advantage based on quality rather than low price. Consequently, the traditional specialisation needs to move from a large-scale, mass activity to a small-scale, ‘niched’ one. Due to rationalisation, traditional activities have become less demanding in terms of workforce. This has been the case, for instance, in the fishing industry in the Irish Sea, or mining activities in the Torne Valley and Central Spain. In order to

regenerate the traditional activities, more niched productions had to be developed: for instance, the development of aquaculture and the extraction of marine aggregate on the Belgian coast, aquaculture specialised in seed mussels along the Irish Sea coast, or the development of organic farming in Sicily and Central Spain.

In some cases, the adaptation to international competition has led to a radical change in the economic specialisation. The most obvious case is the one of Luxembourg: from being a steel-manufacturing region, the Grand Duchy has developed into a centre for financial and high-service industrial activities.

However, some traditional activities have successfully adapted to the global shift, for example mining activities in Northern Norden, whisky-production in the Scottish Highlands, and watchmaking industries in the Jura. These activities not only prosper, but also have expanded, so that they have not only become a growth engine for immediate region, by boosting direct and indirect employment, but also strongly impact the image of the region outward. For instance, in the case of activities such as mining and watchmaking and micro-technologies, the local know-how and experience have been translated into business services that can be exported outside the regional borders.

Finally, in most of the GEOSPECS areas investigated, quite a high share of the workforce is employed in the public sector. Consequently, from a labour-market point of view, public administration has become a specialisation by default, often compensating for a relatively low level of development of industrial activities. From an economic vulnerability standpoint, this characteristic brings some stability to the local and regional labour-market, as public employment is less sensitive to economic downturns. However, it also perpetuates the strong dependency of such areas towards the respective national capital, and thus keeps the region anchored in a core-periphery pattern. Finally, this reliance on public investments can prove to enhance the regional vulnerability in the long run: in the case of Central Spain, the disengagement of the state through cuts in public subsidies to the regional mining activities has had strong impacts on the regional economy.

Networking and social capital

The importance of traditional activities for the regional economies of GEOSPECS areas, discussed above, is much more 'palpable' in terms of cultural and social aspects of local and regional identities rather than in strict economic terms. Consequently, we argue that the traditional activities have an impact that goes well beyond the 'sectoral borders' of a

GEOSPECS area. Indeed, they have been instrumental in maintaining tight social relations, based on trust, acquaintance and kinship, within the region that can spill over to other economic activities, e.g. in business services and manufacturing. In that respect, the perpetuation of traditional activities, although not necessarily economically profitable in itself, can become an important precondition for the development of a diversified range of other activities. Thus, traditional activities have an indirect important role for fostering the establishment and maintenance of local business relations in GEOSPECS areas, in the form of strong interpersonal and social relations.

One of the main aspects of globalisation identified by the literature concerns the increase in interdependencies between territories. From the case studies, we can identify two main aspects of such territorial interdependencies: one concerning the flows of persons (i.e. commuting); and one concerning market exchanges (i.e. transactions). One notable observation is that most of these flows are strongly asymmetrical, thus presenting a core-periphery pattern.

When it comes to interdependencies related to the labour force (i.e. commuting), and when a strong economic centre is in geographic proximity, there is a clear pattern in terms of centre-hinterland. This is obvious in the cross-border regions of Geneva and Grande-Région, as the highly internationalised cities of Geneva and Luxembourg attract skilled workers from their surrounding regions. To a certain extent, this is also the case in the Jura and Central Spain for which, respectively, the Swiss-side and the surrounding metropolises (Madrid, Zaragoza, Valencia) act as magnets for the work force. A consequence of this asymmetrical situation in terms of labour-force supply-demand is that the employment structure in the 'hinterland' is often dominated by the public sector.

'Global specialisation' and the establishment of 'niche-markets' that can give a competitive edge to local and regional economies entail export- or at least outward-oriented activities, and often the necessity to obtain specialised supplies. Consequently, the adaptation of the economic specialisation of local and regional economies often leads to the development of economic exchanges outside their traditional market-zones (i.e. beyond the local/regional centre). In the case of the Jura and the Torne Valley, for instance, the main customers for the regional products (respectively micro-technologies and minerals) need to be found internationally. Nevertheless, this 'global production' is dependent on the availability of specialised and highly-skilled suppliers and subcontractors within the region. In the Jura, it appears that there is a territorial division of labour between both sides of the cross-border area: enterprises on the French side mostly work as subcontractors for enterprises on the Swiss

side; these Swiss enterprises are the ones with international customers. For the Torne Valley, the mining operations themselves are undertaken by multinational companies, either Nordic or foreign-owned; however, these operations necessitate the involvement of many specialised service-subcontractors, often located in the wider Northern Nordic area. The Irish Sea case also shows an interesting example of asymmetrical relations, as the UK is the main trading partner of Ireland, and thus its ports are the main international gateways for Irish production.

Quantitative evidence

The employment data gathered, in the framework of the GEOSPECS project, at the municipal level provides an interesting basis for investigating the aspects of economic vulnerability/robustness related to economic specialisation and diversity.

To identify significant differences in terms of employment profiles, a Factorial Analysis was performed on the subdivisions of each specificity. This led to the following conclusions.

Within each specificity, there is a broad diversity of labour-market profiles. Consequently, it is not possible to identify ONE economic profile for all mountain areas, for example.

Yet, some mountain areas do share, to a certain extent, some similarities in terms of labour-market profile. For instance, in Figure 60, one can identify a grouping of mountain areas that have a strong profile towards Agricultural and Fishing activities (Top-right corner). This is also the case for mountain areas with a profile towards manufacturing (bottom-middle) or mining activities (bottom-right).

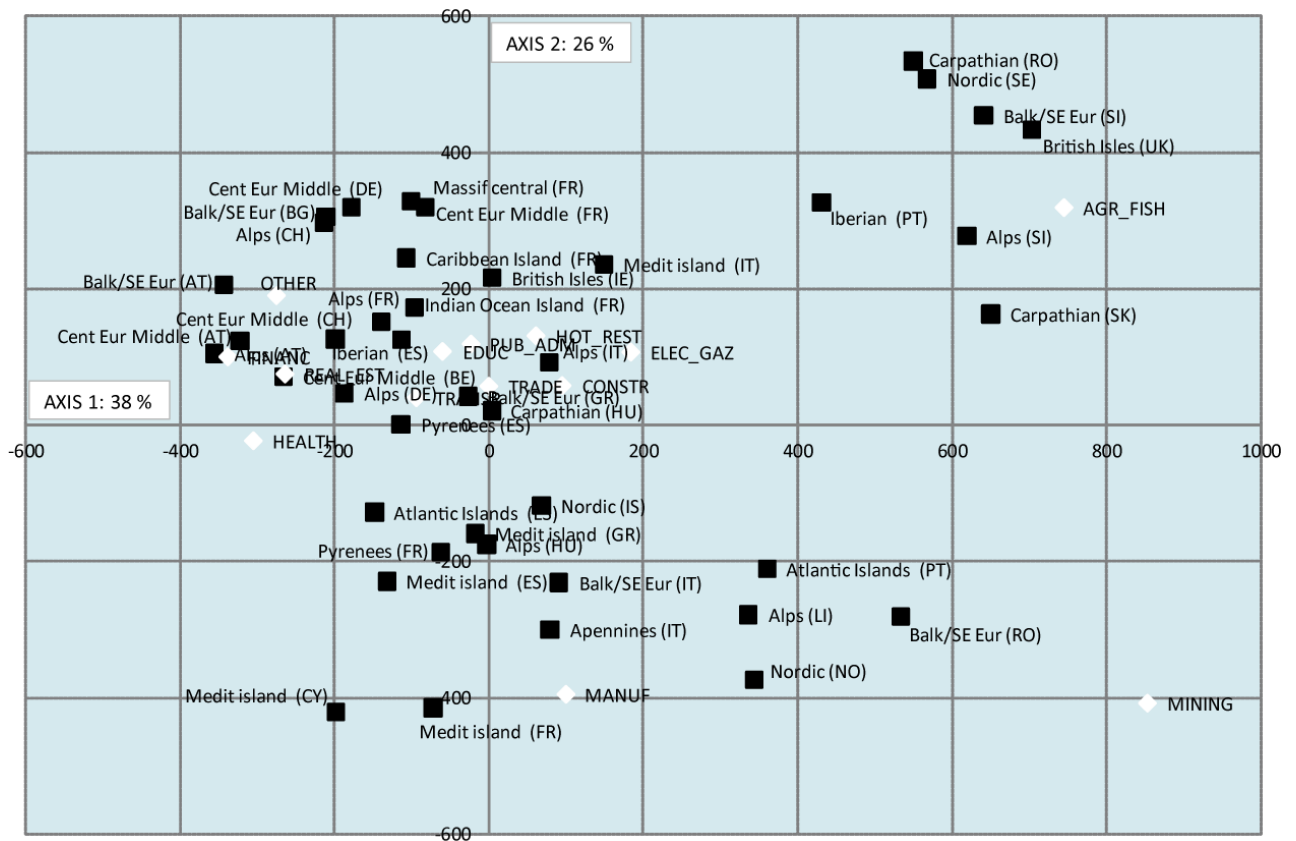


Figure 60 Labour-market profiles in mountain areas

Summary and conclusions

This section proposed conceptual and empirical approaches for understanding issues relating to regional economic vulnerability and resilience. Processes of contemporary globalization have opened up the local and regional economies to the possibility of being included in several economic spaces at the same time. For local economies, traditional economic spaces were structured around the spaces of the nation-state or the regional core-periphery (i.e. urban core and rural hinterland). Globalization (and Europeanisation) processes have, to a certain extent, enabled local economies to participate in other types of economic spaces, the most obvious one being the cross-border one. Furthermore, we argued that the prospects for local and regional economic growth were tightly related to their capacity of retaining or reinventing their competitive advantage across these multiple economic spaces. In that frame of reference, economic specialisation needs to be understood as multi-form, as economic specialisation depends not only on the assets and strengths of the local economy itself, but also on how it 'fits' into the economic landscape of the wider economic spaces in which local and regional economies are embedded.

The notion of geographic specificity, as developed throughout the GEOSPECS project, proposes an interesting vantage point for local and regional authorities to understand the issues relating to economic vulnerability and robustness. We advocate that globalisation implies increased competition between regional and local economies that share the same characteristics and comparative territorial potentials. In that respect, local and regional economies need to understand how what their competitive edge is in their wider 'mountain', 'island' or 'sparsely populated' economic spaces and how existing social capital can be used to support this. By doing so, we argue that local economies would be more able to develop economic specialisations leading to 'sustainable' and robust economic growth.

This understanding acknowledges the need for a more pragmatic, territorial approach to local economic development: for areas with geographic specificity, 'smart growth' is about matching the need for delivering growth on a short- and long-term basis by benchmarking its development opportunities with those of its territorial 'peers'.

As shown through the examples of our case study regions, amenity-based development, i.e. the exploitation of natural and traditional assets, is a key element on which the development of local economies in areas with geographic specificity ought to be based upon in a short-term perspective. However, as suggested by Simmie and Martin (2010), in the long-term perspective, such local economies need to "move up the value chain, by focusing development on the knowledge economy". Yet, we argue that this move "up the value chain" needs to be incremental and grounded in the development path of the region, so that it can draw on the advantages linked to social capital, which, as we have seen in our case study regions, is often founded on an socio-cultural identity originating in traditional activities.

6.2.2 Accessibility and services of general interest

Relevance of these transversal themes for the socio-economic development of regions and localities

Accessibility and Services of General Interest (SGI) are strongly linked concepts. This is the reason why GEOSPECS considers them together in one transversal theme.

- Accessibility is defined in GEOSPECS as the distance in time to urban areas considering all modes of transport (rail, road, flight, ferry); not as the Euclidian distance. Accessibility is frequently used as a proxy for the access from rural areas to SGI located in large cities (e.g. markets, facilities and employment) (Carver et al., 2002; ESPON, 2004, 2006). In rural land-use change studies, accessibility is often described by simple measures of the distance to a location of interest (Verburg et al., 2004). Alternatively, EU-wide methods have been developed to determine accessibility for all combinations of transportation modes – roads, rail, air and navigable water – with a wide variety of applications (ESPON, 2004; Uchida and Nelson, 2009).
- Following the Europa glossary, Services of General Interest (SGI) are “services considered to be in the general interest by the public authorities and accordingly subjected to specific public-service obligations. They include non-market services (e.g. compulsory education, social protection), obligations of the State (e.g. security and justice) and services of general economic interest (e.g. energy and communications). Article 86 of the Treaty (former Article 90) does not apply to the first two categories (non-market services and state obligations)”. There is a current trend of privatisation of public responsibilities, and therefore privately managed services are considered as SGI in GEOSPECS.

Accessibility and SGI are associated with the availability and development of an **efficient infrastructure**, which is a prerequisite for people to be able to perform essential functions such as living, working and mobility, and for the economy, to facilitate the production and sale of goods and services. Having accessible SGI is an important precondition for ensuring equal living conditions and opportunities for development in all regions. Therefore the two concepts are closely connected with the development of population and the economy of regions and localities.

What are the specific roles of accessibility and SGI in socio-economic development?

1) Accessibility

This concept is directly related to the availability and development of infrastructures. Moving people and goods quickly, efficiently and cheaply is a central tenet of the EU's goal for a dynamic economy and cohesive society. Development and planning policies are concerned with equity and a better distribution of people and activities in the territory. We cannot promote the development of the whole without knowledge of all territories and the relationships between them.

In general, territories with geographic specificities have a lower potential to develop economies of agglomeration. The small size and relative isolation of their local economies imply that they are more open (i.e. less circular) and more specialised than other areas. The approach to this issue in GEOSPECS is based on the analysis of small island state economies by Read and Staines (2004), who observe that "economic vulnerability arises primarily because of the high structural openness" of these economies, which make them more dependent on external forces, fluctuations in the demand on the global commodity market and seasonality of activities (e.g. tourism). A further cause of economic vulnerability, in the light of globalisation processes, is the lower capacity of these territories to access information (connectivity to ICT networks), capital (proximity to financiers and capacity to attract FDI), and customers and clients (transport networks to main European and global markets).

2) Services of General Interest

With regard to territorial cohesion, SGI policy issues tend to be associated with two contrasting geographical contexts: (i) rural areas, especially those that are sparsely populated and/or distant from centres of population, and (ii) metropolitan areas or agglomerations that are typically the location for specialised high-order SGI. In the rural areas, the policy issues concern adequacy of provision where the public sector is reducing or withdrawing provision, and declining viability of private service enterprises, when rising demands for SGI occur due to changes in demographic structures. In metropolitan areas, the policy issues relate to the effectiveness of higher-order services to support the global economic competitiveness of the city and its surrounding functional region.

Current European policy processes of importance for the transversal theme

1) Accessibility and connectivity

Transport infrastructure is one of the most visible examples of what can be achieved with aid from the EU Structural and Cohesion Funds. Enhancing accessibility is of key importance to strengthening regional economies and achieving cohesion and competitiveness. The EU's transport policy promotes sustainable mobility for people and goods, ensuring efficiency, safety and minimising negative effects on the environment. Investments cover transport strategies at EU-, national and regional levels that strike a balance between road, rail and sustainable transport modes. In urban areas, clean transport is promoted. Cohesion Policy investments in transport between 2007 and 2013 will be concentrated in the Convergence regions, as follows:

- Trans-European Network (TEN)-T projects across all transport modes will receive €38 billion (11% of the total of Cohesion policy investments). About half of this will be allocated to road infrastructure and the remainder to rail.
- Overall, almost €41 billion (12% of the total) will be available for road infrastructure, including TEN-T and national, regional and local roads.
- For rail infrastructure, a total of €23.6 billion (6.8%) will be spent, including TEN-T projects.
 - Other allocations include: urban transport: €8.1 billion (2.3%), ports and inland waterways: €4.1 billion (1.2%), multimodal transport and intelligent transport systems: €3.3 billion (1%); airports: €1.9 billion (0.5%).

Although many aspects of transport policy come under national governments, it makes sense for the European single market to have a single transport infrastructure. This is why the EU has opened national transport markets across the Union to competition, particularly in the road and air sectors and, to a lesser extent, for rail. Liberalised air travel has brought more competition and lower fares as well as more connections between Member States. The EU also promotes major transport infrastructure projects, the TENs. However, connecting territories means more than ensuring good intermodal transport connections. It also requires **adequate access to services** such as health care, education, sustainable energy, broadband internet access, reliable connections to energy networks, and strong links between business and research centres. This is also essential to address the special needs of disadvantaged groups (Green Paper on Territorial Cohesion {SEC(2008) 2550}).

- **Access to integrated transport systems** involves building roads or rail links between cities, inland waterways, and developing inter-modal transport chains and advanced traffic management systems. In the new Member States, good road links are scarce and driving between cities takes much longer than in the EU15. Good rail links are also unevenly distributed, and railway lines in most Member States cannot handle high speeds and are often in need of repair. The uneven quality of secondary road networks and public transport means that airports often take time to reach, while transport by sea, which can take pressure off congested roads and reduce CO₂ emissions, remains under-developed.
- **Reliable access to energy** is equally important, and the particular situation of networks isolated from the EU market for geographical (rural and remote regions, islands) or historical reasons (e.g. the Baltic States) needs to be further addressed to ensure a robust and efficient supply. Renewable energy and energy efficiency measures can offer opportunities for diversification and sustainable development.
- **Access to services of general economic interest such as health care or education** is often a problem in rural areas where, for example in remote regions, 40% of people on average live more than a 30-minute drive from a hospital and 43% live more than an hour's drive from a university. In remote areas especially, the potential of ICT to provide access to health care and education through telemedicine and remote learning remains to be fully developed.

Many European rural areas are in areas with geographic specificities. These rural areas face significant challenges. Some of their farming and forestry businesses still need to build their competitiveness. More generally, average income per head is lower in rural regions than in towns and cities (van Eupen et al., 2012), while the skills base is narrower and the service sector is less developed. Also, caring for the rural environment often carries a financial cost. One of the main areas of the Rural Development Policy deals with the development of access and connections between cities and rural areas, especially in the context of the information society.

A related topic to accessibility is **employment and social inclusion**. Promoting the integration of all people in society, in particular those on the margins, is a fundamental goal of the EU. The social welfare and support systems in place across Europe reflect this shared value of social cohesion. Yet many groups of people in the Union are socially excluded, because of a disability, because they are low-skilled, because they live in deprived areas with limited access to services, or because of health problems.

The historical review of major initiatives to support local development presented in the 'Cohesion policy support for local development: best practice and future policy options' report shows that one policy priority concerned accessibility of the region and improvement or modernisation of the network infrastructures (e.g. public service utilities such as energy, transport, water and waste) and amply justified the high appropriations of the Cohesion Fund.

2) Services of General Interest

SGI are an important component of what has been described as "the European Model of Society" (EC 2003). They are referred to twice in the EC Treaty (Article 16 and Article 86), and also in the Charter of Fundamental Rights of the European Union (Ibid). More specifically, they are considered to play a very important role in achieving territorial cohesion (EC 2008). Their importance derives from the fact that, on one hand, they address the essential needs of citizens in order to ensure an acceptable level of quality of life and, on the other hand, they deliver key elements of the preconditions for economic competitiveness, innovation and growth.

In May 2003, the European Commission adopted a Green Paper on SGI in Europe. This opened a debate on the role of the EU in promoting the supply of general interest services, in defining their general-interest objectives, and the ways they are organised, financed and evaluated. In May 2004, the Commission issued a White Paper on SGI, setting out the approach taken by the EU to promote the development of quality general-interest services. It presents the elements of a strategy to ensure that all citizens and firms in the Union have access to quality general-interest services at affordable prices. The Commission has decided to develop its sectoral approach without issuing a general directive for the moment.

SGI can contribute to achieving the objectives of the Lisbon Agenda (competitiveness), the Territorial Agenda (2007), and the Territorial Cohesion Green Paper (EC 2008), which are given added urgency by the inclusion of Territorial Cohesion in the Lisbon Treaty. Looking ahead, SGI are at the heart of EU2020, with its aspiration for "smart, sustainable and inclusive growth". More specifically "smart growth" is to be achieved by "fostering knowledge, innovation, education and digital society" and "inclusive growth" is to be achieved by "fostering a high-employment economy delivering social and territorial cohesion".

Quantitative characterisation of areas with geographic specificities based on their accessibility and SGI

An attempt has been made to provide a quantitative characterisation of the accessibility and provision of SGI in areas with geographic specificities, based on the limited set of indicators available at pan-European level (Table 35). The indicators used are average accessibility to cities, number of air destinations, jobs and age distribution in urban areas and GEOSPECS areas with geographic specificities, i.e. Coastal areas, Border regions, Islands, Mountains, Sparsely Populated Areas (SPA), Outermost Regions and Inner Peripheries (IP). The proxy variables used to characterise SGI are (i) number of air destinations; and (ii) total jobs, jobs in the education and the health sectors (as % of the total amount of people in the area). The distribution of the population in three age categories (as average proportion of the total amount of people in the area) is used as additional indicator to characterise these areas. The values for inner peripheries correspond to the two case studies of Parkstad (NL) and Werra-Meissner-Kreis (DE).

This analysis shows that these areas do not follow the same patterns but, on the contrary, show the following disparities:

- On average, coastal and border areas have good accessibility to cities; mountain areas have an intermediate accessibility; and Islands, SPA and Outermost Regions have a very low accessibility – on average, it takes more than 2.5 hours for their inhabitants to reach cities with at least 25,000 inhabitants. Inner Peripheries, represented by the two case studies Parkstad (NL) and Werra-Meissner-Kreis (DE), have high accessibility by road to cities. The section on IP confirms this finding, as inaccessibility is not the main cause of IP; rather, it is lack of employment and demographic decline. In fact, high accessibility to nearby urban centres causes the demographic decline in many cases.
- The number of air destinations (as a proportion of the total number in Europe) provides additional information on accessibility by plane since the accessibility travel times were calculated for different road types, railways and frequently used ferry-connections, but not for airports. It appears that 97% of the air destinations are in urban areas. The number of air destinations confirms the relatively good accessibility of coastal areas mentioned before. However, border regions and mountain areas are poorly accessible by air as they have, respectively, 68% and 86% fewer air destinations than urban

areas. Islands, SPA, Outermost Regions and IP are barely accessible by air.

- In coastal areas, 69% of the population have a job, which indicates a quite high employment rate, being 50% higher than the European average. The population with a job in Outermost Regions is similar to the European average, whereas in islands, mountains and SPA it is about 30% lower than the European average. Border regions and IP have the lowest proportion of jobs respectively, 35 and 38% lower than the European average.
- The number of jobs in health and education are used as a proxy for the potential access to health and education services. Coastal areas are the only geographic specificity with a very high proportion of these jobs, being 70% above the European average. In contrast, the other geographic specificities are below the European average. In Outermost Regions, the number of jobs in education is only 3% below the average; in islands, 17% below the average; in mountains, SPA and border regions 0% below the average; and lowest in IP (50% below the average). Strikingly, the number of jobs in health is far below the average for all geographic specificities except the coastal areas. The values for the IP case studies do not provide a consistent trend.
- The age distribution is considered as indicator of potential demand of accessibility and SGI. For example, a high proportion of children will require good provision of education services to keep families in the region. On the other hand, a high proportion of older people requires good provision of health services. The proportion of children in coastal and border areas is similar to the European average, in Outermost Regions it is 26% higher, whereas in islands and mountains it is about 10% lower, and even lower in SPA and IP, at about 30%. For all specificities, the average population aged 15-65 is quite similar to the European average, being SPA having the lowest proportion (14% lower than the European average). Finally, the proportion of the population aged over 65 shows a reverse trend to the proportion of children, being lowest in Outermost Regions (27% lower than the European average) and the highest in SPA (53% higher than the European average).

This analysis shows that differences between geographic specificities exist in accessibility and provision of health and education services. Coastal areas are by far the best accessible and best provided with health and education services. The lower accessibility in mountain regions shows the impact of topography on travel times. In island regions and Outermost

Regions, accessibility is more dependent on transportation by freight and passengers by plane or ship. However, it is important to consider that, for SPAs and Outermost Regions, reasonable thresholds for remoteness are probably different in the perception of local people than for those living in highly populated areas.

In Outermost Regions, the potential higher demand for education is in balance with the number of jobs in this sector. In contrast, the high proportion of older people in SPA is not in balance with the low number of jobs in the health sector. Consequently, these regions, characterised by sparse settlement structures and declining demand as result of demographic changes, have a high chance of facing problems with carrying capacity, i.e., the rate of the utilisation of infrastructure for the provision of SGI (BBR, 2006). The tipping point is reached when the demand potential needed for the efficient operation of such infrastructure no longer exists.

These findings help the understanding of the role of accessibility and SGI in supporting the EU2020 “smart and inclusive growth” in different geographical contexts. Since EU2020 proposes that each Member State develops its own strategy and targets, it is anticipated that there will be substantial interest in these findings regarding better methodologies and indicators to facilitate the assessment of the current situation, and to allow wider dissemination of good practice and innovation in accessibility and SGI provision.

Table 35 Characterisation of the accessibility and provision of SGI in areas with geographic specificities

Type of areas	Area (% total EU27)	Accessibility to cities ¹⁶⁴ (min)	Number of air destinations	Total Jobs	Jobs in Education	Jobs in Health	Age < 15 years	Age 15-59 years	Age > 60 years
Europe	100%	121	100%	44%	3.0%	4.4%	16%	59%	25%
Urban	46%	107	97%	48%	3.3%	5.0%	17%	60%	23%
Coastal	37%	114	62%	69%	5.3%	7.5%	17%	59%	24%
Border	39%	120	32%	29%	1.7%	2.4%	17%	60%	23%
Islands	3%	152	1%	32%	2.4%	2.1%	15%	55%	27%
Mountains	29%	135	14%	32%	1.9%	2.3%	15%	57%	28%
SPA	17%	169	0.05%	33%	1.9%	1.9%	12%	51%	38%
Outermost Regions	2%	174	0.32%	44%	2.9%	2.6%	21%	61%	18%
IP Parkstad	0.004%	67	0.01%	28%	1.2%	6.3%	16%	63%	21%
IP WMK	0.418%	87	0.39%	27%	1.5%	2.4%	12%	59%	29%

¹⁶⁴ Calculated according to van Eupen et al. (2012), who constructed a new accessibility dataset with a 1 km² resolution, based on the ArcInfo cost-distance algorithms (ESRI, 2006; Verburg et al., 2010). This approach calculates the travel time to the nearest destination of interest for each 1 km² in Europe, given the defined transportation network. Travel times were calculated based on a friction surface and average travel speed for different road types, railways and frequently used ferry-connections. In regions with steep slopes, the speed was decreased. Since urban areas of varying sizes offer different services and facilities, the final measure of accessibility was based on the average time-cost to different city sizes (to cities of more than 25,000, 60,000, 100,000, 250,000, 500,000 and 750,000 inhabitants). By including the larger cities, the weight of urban agglomerations that provide the most services is larger than small towns.

6.2.3 Role of Information and Communications Technologies (ICT)

Defining ICT and the Information Society

ICT can be understood as a collection of technologies and applications, which enable electronic processing, storing, retrieval, and transfer of data by a wide variety of users or clients. ICT are characterised by very dynamic technological changes and convergence, decreasing costs for new equipment and features, and a rapidly increasing range of applications and penetration in an increasing number of realms of professional and personal life (Cohen et al., 2002).

ICT comprise enabling technologies but also constitute a sector. As ICT progressively spread to more and more sectors, they could be classified as ICT sectors (for example media, publishing, etc.). The OECD defines the ICT sector as a combination of manufacturing and services industries that electronically capture, transmit and display data and information. Thus, ICT providers can be classified in terms i) manufacturing of ICT, ii) wholesale and retail trade of ICT, iii) ICT network services, iv) other ICT services. Similarly, investments in ICT can address hardware, software, network infrastructure (communications equipment) and, in principle, training of personnel.

Geographical impacts of ICT

If experts eventually agreed on the positive impact of ICT on productivity and growth, the geographical impacts of these developments in general and of the ICT revolution in particular are still disputed. Can the IS contribute to the reduction of territorial imbalances? Can it help compensate for disadvantages partly caused by certain territorial specificities? In which ways can it help turn such disadvantages into growth factors?

Some cyber prophets and technological optimists claimed that the emergence of the digital economy would kill distance, make urban regions superfluous and, at the same time, eliminate the scale disadvantages of smaller and more peripheral regions (e.g., Negroponte, 1995, Friedman, 2005). Their basic idea was that the spread of the use of ICT has the potential to replace face-to-face activities, i.e. to substitute physical movements that formerly occurred in central locations, which would strongly reduce or even eliminate agglomeration economies and hence make all economic activities totally "footloose". This concept, sometimes labelled "substitution theory", has been largely challenged, both in theory and in fact, as simplistic and determinist.

New Economic Geography (NEG) theory, which has developed since the early 1990s, provides economic theoretical tools to understand the factors driving spatial transformations and how these transformations affect regional economic growth (Krugman, 1991). As noted above, the increased use of ICT enables major reductions in geographical transaction costs by reducing spatial information frictions. When these costs are reduced, producers in large markets have good opportunities to exploit economies of scale and to lower production costs by also delivering to other regions. This leads to cumulative causation or positive feedbacks initiated by the effects of ICT on geographical transaction costs. Thus, as a first conclusion, we may assume that investments in ICT, particularly in communications equipment, stimulate further agglomeration. The original version of NEG theory said nothing about the role of knowledge in regional economic growth except for increasing returns (economies of scale). However, since the development and exploitation of ICT is intimately associated with the development, diffusion, appropriation and use of knowledge, it is necessary to integrate knowledge and knowledge externalities in this framework.

During the last decades, the internationalisation of production and globalisation of markets have created the preconditions for geographical location choices based upon global rather than national considerations. Company units and plants are located where the environment is the most attractive (in terms of labour force, R&D, etc.). Two technological conditions, production decomposition and network control, have made these new scenarios possible. Improved monitoring using ICT can, in principle, lead to better, faster, and more timely flows of goods and persons from origin to destination. ICT is, in this sense, first and foremost a complementary technology, rather than a substitute, to existing distribution and transportation networks. ICT is likely to increase the efficiency of the distribution and transport delivery systems through reducing transport costs and better use of transport infrastructure (Soete in Karlsson & Stough, 2006). Thus, in addition to more traditional determinants of industrial location, such as transportation networks, low costs, etc., location choice is increasingly driven by access to particular skills, technology, and knowledge, as well as entrepreneurial talent and venture capital. The high concentration of people and firms in large urban regions creates an environment that answers these needs. These areas offer substantial advantages in terms of knowledge flows and spillovers of knowledge both within and between sectors (as opposed to conventional industrial districts).

This suggests a reformulated NEG model based upon knowledge externalities (Fujita, et al., 1999). When a (large) functional region has

achieved an initial advantage in knowledge production, due to a large pool of well educated labour and a rich supply of ICT capital assets, it will attract additional knowledge-creating and knowledge-utilising firms and subsequently a highly qualified labour force, which wants to take advantage of the increasing demand for its skills.

Even if, in principle, improvements in ICT could eliminate the demand for face-to-face interactions and make cities obsolete in this respect, empirical results suggest that the use of mediated contacts is mainly a complement to face-to-face interactions. The conclusion is that, as ICT is spreading, the demand for interactions of all varieties, including face-to-face interactions rises (Veltz, 1996). Confidence is a key element in human relationship and cannot be stimulated through ICT. Thus, it should be no surprise that most firms in the Internet industry are concentrated in key metropolitan regions. People working in the information society businesses also want to live in urban areas, for reasons related to consumption and tastes, conjugal and other social relationships. In terms of data evidence, emails or phone calls in cities are for largely local and not long-distance (Imagawa, 2002).

Nevertheless, negative externalities, such as congestion or high costs, can hinder the expansion of large metropolitan areas (Fujita et al., 1999). In Europe, studies show that, except for cultural aspirations, big cities with more than 1.5 million inhabitants can lose attractiveness (Lorenzen and Anderson, 2007). In this context, ICT can play an important role in the relocation of economic activities and the mobility of a high-skilled labour force who may want to find a quieter and greener living environment.

In addition, as ICT penetrate every sector, development opportunities are created in more and more conventional activities (agriculture, tourism, craftwork, etc.). In addition, the natural resource base of rural areas allows them to be players in global markets, linking directly and quickly to distant clients (fisheries, natural medicines, etc.). In this sense, ICT are a significant driver for shortening distribution channels. Furthermore, certain innovative rural regions profit from their global connectivity. Innovative high-tech companies with worldwide trading and links can be found in rural areas in Finland, Norway, southern Germany and other parts of Europe. Regions in the Nordic Countries seem to overcome their peripheral location by capitalising on strengths in relation to ICT, research, educational and environmental opportunities.

Last but not least, ICT is becoming widely used in public administrations and services. The development of e-government, telehealth and e-learning represents an important complement to public services where these are limited.

Effects of ICT in territories with geographic specificities: general assumptions

A first concern is that, even in the EU, access to Internet is an important issue that is still not satisfactorily addressed. ICT operators basically follow market rules and tend to invest in heavy and costly infrastructure only in densely populated and wealthy areas, where they are sure to find a sufficient number of clients. Remote, sparsely populated areas or zones where the installation of this infrastructure is particularly costly (e.g., mountain areas or archipelagos) tend not to be attractive to these private operators – unless public policies are enforced to compensate. In areas with no or very little permanent population, telecoms coverage is particularly difficult. Such areas can be found, for example, in northern Scandinavia and other sparsely-populated areas, in isolated communities located in mountain areas, or French Guyana (Outermost Regions). Such areas have a clear problem originating from their remoteness: the technologies in common use are simply out of their reach. A further constraint is in nature conservation areas, especially at high latitudes, where environmental considerations rule out the erection of the 3G-masts needed for mobile telephony. In addition, satellite coverage is often inadequate or too expensive.

Second, ICTs comprise technological solutions whose socioeconomic impacts are likely to be very limited in areas where the human environment does not allow their efficient use. In addition to the inadequacy or absence of local infrastructure, factors which impede demand for ICT in GEOSPECS territories might be characterised by:

- Demography: some areas have an ageing population less inclined to use ICT;
- Education – some areas may have a higher proportion of ICT illiteracy;
- A lack of relevant applications – ICT applications need to focus on the specific needs of the territory / population;
- Low awareness and cooperation – among individuals and businesses: advanced methods of cooperation and innovation in the usage of ICT remain largely unused, with the potential of ICT for economic growth and competitiveness used only at a very basic level;
- The cost of ICT services – the lack of flexible and creative sales packages inhibits profitable take-up by rural businesses. These small markets (in terms of customers but in large geographical

areas) can deter the implementation and development of ICT *support services companies*.

In terms of public services, there are a great number of opportunities in health, education and training, administrative processes, public procurement and institutional communication, access to logistic and postal services, etc. However, these should not substitute for existing physical local services and administrative agencies; ICT should be promoted where no physical solution is viable (e.g., archipelagos). Amongst other specific opportunities, it is also worth mentioning:

- Border regions and Outermost Regions: the maturation of the standards used to connect disparate communications networks, permitting address assignment, roaming, email messaging and file transfers;
- Mountain and coastal areas: improvement of rescue services (beacon and GPS device);
- Sparsely populated areas: community networks, citizen empowerment.

Key questions

Key questions can be classified within three categories:

- Prerequisites and general awareness: What are the mobile phone and high-speed internet coverage rates in these areas? Are there technical and / or environmental constraints? What about awareness and ICT abilities?
- Territorial continuity and access to public services: Are ICT solutions used to provide better public services for isolated people? Are there observable impacts in terms of health / education / migration flows / etc.? Does ICT enable better information sharing and reduced bureaucracy? Has ICT increased access to knowledge flows between metropolitan areas (university networks, etc.) and their visibility?
- New opportunities and socio-economic impact: Has the development of ICT facilitated the creation of new sectors? Has it increased competition within the territory or with neighbouring areas? Are ICT goods and services provided by local suppliers?

Review of relevant findings from the case studies

Prerequisites: supply side

Telecoms connectivity is inherently more commercially attractive in urban areas due to the lower deployment costs per user. Hence, in GEOSPECS territories, it is often more challenging to put forward a convincing case for the private sector to provide widespread connectivity. In addition, neighbours in remote communities are more likely to share internet connections than in cities, sometimes through public access points, further reducing the client base. Alternative technologies, especially mobile solutions such as WiMax and satellite internet access (VSAT), are sometimes required to reach the most remote areas, for example in Greece (archipelagos), Austria (mountainous areas) or French Guiana (sparsely populated area).

For all these reasons, substantial public investments are generally necessary to provide such infrastructures. Thanks to policy support programmes (national and EU), GEOSPECS territories are likely to benefit from adequate telecommunication coverage:

- In Scotland, the Highlands and Islands do not compare unfavourably with the rest of the UK: ADSL coverage is 95%, compared to an average of 99.8%, a better rate than in many major economies (e.g., Japan, Spain, Italy, Germany or the USA);
- In Finland, the Government launched a project in 2008, aiming to provide 99% of the population with fast optical fibre or cable network by the end of 2015. Surveys of the Ministry of Transport and Communications estimate that 95% coverage will be achieved on market terms, and the remaining coverage on sparsely populated areas will be constructed partly with public financial support.

Infrastructure is not the only issue in terms of telecommunication supply. Because of their small size, some operators do not propose services in some GEOSPECS territories even when public authorities partly finance the network. Hence, former monopolists still occupy strong positions in national markets for local access and fixed telephony. This lack of competition, characterised by the absence of local loop unbundling (LLU) and fewer bundled offers, results in higher costs for users. Even though regional/local authorities invest in ICT infrastructures, they do not provide IT services and must ensure that private operators use these grids.

Mobile phone operators' geographical coverage is not always fully effective, especially for new suppliers. Accordingly, people living in GEOSPECS regions tend to opt for the key operators to ensure sufficient

quality services, even if it is more expensive. In addition, people living in border regions have to face additional costs or roaming services. Finally, some figures show that, despite complete broadband coverage, some regions can show limited performance in terms of household connections. In particular, socio-economic characteristics and cultural barriers can hinder broadband penetration (see quantitative section).

Territorial continuity and access to public services

ICT, and the information society in general, can provide effective answers to many of the challenges faced by GEOSPECS territories.

Education is a domain where ICTs can have a positive impact. The implementation of ICT equipment and tools in teaching and learning processes, in particular e-learning applications, reduces (but does not necessarily eliminate) the need for students and teachers to travel to a certain university/school, library, etc. In some Geospecs territories, the education system has put a strong emphasis on on-line approaches complementary to a traditional campus-based university, where face-to-face lectures and seminars are backed up by the use of a virtual learning environment. In Scotland, for example, the use of ICT for further and higher education is particularly well developed through both the **University of the Highlands and Islands** and the Open University (a UK distance-learning institution). The Scottish Government has also been proactive in primary and secondary education.

ICTs now play an important role in the delivery of better and more efficient healthcare services by breaking down barriers, enabling health service providers to work more closely together. E-Health services facilitate access to healthcare, whatever the geographical location, thanks to innovative telemedicine and personal health systems. Telecare generally refers to remote care of older or disabled persons in their homes with the help of sensors connected to a monitoring centre. The gains can be assessed in terms of expedited hospital discharges, avoidance of unplanned hospital admissions and avoided care home admissions. Scotland began to develop a Telecare Development Programme (TDP) in 2006. The supporting telecommunications infrastructure and development of innovative telemedicine have been particularly well implemented in northern peripheral regions: Scandinavian countries demonstrated early and clear commitment to developing e-health within their remote and sparsely populated areas. The first telemedical pilot project started in 1996 in southern Lapland in Sweden, and today most hospitals in Finland offer remote video consultations between primary and secondary healthcare centers; health record systems have been rapidly implemented

in all hospital districts and healthcare centers. Because local medical records are already electronic, E-health concepts to manage chronic diseases have been easily developed in Finland. Finnish healthcare services have also tested a range of e-health solutions, including mobile phone systems.

In French Guiana, the French National Space Center and Cayenne hospital (CHC) have been working together since 2000 on the contribution of space systems to public health matters. Initially developed to meet astronauts' health needs, telemedicine wallets allow doctors to diagnose diverse pathologies, and to care for patients at a distance, even in the most remote areas. Over 34,000 teleconsultations have been carried out since December 2001. In addition to ensuring rapidity and diagnosis reliability, this method can avoid costly and stressful medical evacuation for isolated patients.

Remote sensing and geographical information systems are also ICT tools of particular relevance in GEOSPECS areas and related social and environmental challenges, for instance in tackling issues such as maritime affairs (safety, fishing, etc.); natural resource monitoring (forests, water, etc.); land use; illegal construction, immigration.

ICT are also used to support local democracy and facilitate citizens' empowerment. E-democracy is particularly relevant for reaching isolated communities that cannot always contribute to local governance and public life. Living Labs are a new way of interacting without geographical constraints consists of creating a local community of users/citizens by using new ICT tools in order to share needs and co-create and experiment with solutions. This is an interesting way of fostering local democracy and innovative public services: examples include Aboland living-lab¹⁶⁵ in Finland and Territorial Living Lab (TLL)¹⁶⁶ for the Sicilian region. Nevertheless, excessive and uncontrolled use of such e-democracy practices can result in the polarization of opinions, as well as populism and demagoguery. As regards ICT in public services in general, other concerns are often also emphasized, notably in terms of data protection and identity theft. Using ICT as an alternative to physical services rather than as a complement is also likely to accentuate the exclusion of those without a good broadband connection, as well as those who are less comfortable with computers or, indeed, form filling.

¹⁶⁵ <http://www.openlivinglabs.eu/livinglab/turku-archipelago-l>

¹⁶⁶ <http://www.openlivinglabs.eu/livinglab/tll-territorial-living-lab-sicilian-region>

New opportunities and socio-economic impact

Until recently, rural businesses have been slower to adopt ICT than their urban counterparts. This can be surprising for those who have theorised that rural firms had more to gain from the benefits of the internet in terms of reaching new markets and accessing information flows. However, levels of adoption in rural areas are now higher throughout social and business life, and more rural firms are using ICT for business use.

A key issue about ICT adoption in territories that are rural or have difficult accessibility is that many businesses have been established to provide services to the local population or traditional sectors. Compared to core/urban areas, a greater proportion of the population is self-employed in trades and other activities that are not easily transferred beyond the local economy. In this respect, enhancement of local trading may have been a more important driver of internet adoption than potential access to external markets. A further issue is that of language, with firms in non-English speaking regions likely to encounter greater obstacles in dealing with international markets, particularly if they try to use websites which are not translated into English. Nonetheless, homeworking is still believed to compensate for a lack of jobs and local market opportunities. Scottish regions have actively tried to make use of these prospects, such as the concept of 'Live Local-Work Global' in the Outer Hebrides.

At the individual level, homeworking is generally viewed as positive for those who adopt telework solutions. It is likely to provide significant lifestyle gains in terms of reduced commuting, balancing work with other demands such as caring, and operating from a peaceful and preferred working environment. In terms of socio-economic impact, the benefits are however less obvious. Teleworking is generally available to those who move from cities to certain GEOSPECS regions and retain a previous job, rather than being available to existing residents. The immigrants, generally highly-skilled (IT managers, editors, artists, etc.) are looking for a better quality of life and can do most of their work at home, via Internet. However, they still want physical access to core regions or big cities. Consequently, the regions likely to benefit from this trend are attractive (in terms of weather, natural & cultural assets, etc.) with effective transport infrastructure (high-speed train, airport, etc.). Eventually, the development of teleworking in a specific sector can lead to the installation of companies which are likely to find clients/suppliers, available labour force and low-priced premises.

While employment and added-value in the ICT sector tends to be rather concentrated geographically around Europe's 'blue banana', some GEOSPECS territories are also likely to develop ICT sector. The Highlands, Malta, and some Irish or Polish regions, for example, have successfully

developed competitive ICT sectors. Reasons for ICT service companies to establish in these areas are labour availability and qualification as well as costs. The public sector can also be a significant driver for the development of ICT sectors. Public organisations are major clients for ICT companies (health, fiscal affairs, etc) and specific demand-driven policies can have a substantial impact on local businesses. To this respect, the institutional context is important. In decentralised countries, regional authorities have greater responsibilities and thus are likely to solicit local suppliers. In contrast, in more centralised countries, IT projects and contracts are managed at the national level. Similar issues can be found when considering big companies and multinational firms (e.g., banks, tourism, car industry) where strategic choices are made in headquarters located outside GEOSPECS regions, notably in terms of information systems and other aspects of ICT.

Quantitative evidence

There is a serious lack of relevant data at a regional (and even more at a local) level: this issue that is not adequately addressed by national statistical organisations. According to the last Digital Competitiveness report (2010), the average national coverage of DSL networks in the EU increased from 87% of the population in 2005 to 94% in 2009. The gap between Member States has narrowed substantially as coverage rates have risen in countries where they were lowest, notably Greece and Slovenia. Broadband coverage in sparsely populated areas generally lags behind that in densely populated ones. In three countries, Bulgaria, Romania and Cyprus, broadband still covers less than 50% of population in these areas. Statistics in terms of household connections confirm these national differences, showing that broadband coverage is not sufficient to ensure full take-up of internet for the population. In 2009, around 55% of households in the EU had broadband. In Sweden, the Netherlands and Denmark, the proportion was around 77–79%. At the other extreme, only a quarter or less of households had broadband in Romania and Bulgaria, and in Greece 34%, Italy 39%, and Portugal 46%.

Figure 61 demonstrates a correlation between the general level of ICT accessibility and territorial disparities. In countries such as Sweden or the UK, there is nearly no difference in terms of share of population with access to broadband between densely and sparsely populated area. This is the result of early proactive policy and investments, mainly at national level, and favourable socio-cultural factors.

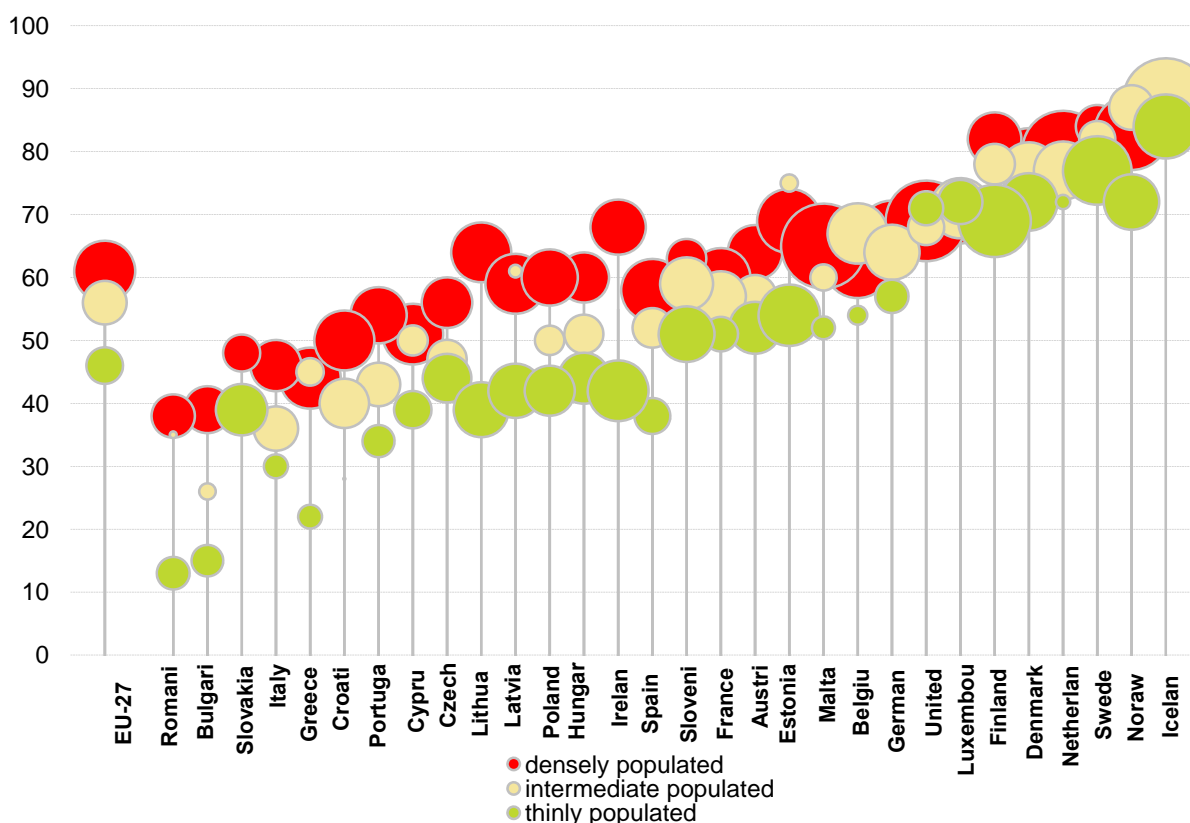


Figure 61 Households with broadband access by degree of urbanisation, 2009

Source: Eurostat regional yearbook 2011

Territorial socio-economic characteristics, especially in terms of living standards, are closely linked to ICT development. Results from an ESPON project¹⁶⁷ show that, in general, territorial differences in terms of IS performance (broadband access, penetration rates for households and firms, employment in ICT intensive sectors and patents) do exist. Although IS differences are less strongly pronounced than territorial differences regarding economic performance (GDP per capita), they partly follow a similar pattern.

Demographic characteristics are also decisive: statistics show that 'digital natives', i.e. people from 16 and 34, especially from 16 to 24, mostly students, are the most regular, intensive users of advanced internet services. There is an evident, profound break with previous generations in the attitude towards the use of internet services. In the UK, 62% of the adults who had never accessed the internet (6.4 million) were over 65.

¹⁶⁷ ESPON project 1.2.3 Identification of Spatially Relevant Aspects of the Information Society (Final Report March 2007)

Also, the presence of children is an important factor for access to a computer and to the Internet: on average, a household with one or more children in Europe is 3.9 times more likely to have such access than a household without children.

Summary and conclusions

Because of geographical constraints (distance, mountains, low population density, etc.) the adoption of ICT and diffusion of the knowledge economy have been more complex in some GEOSPECS regions. Political willingness and substantial public investments have been necessary to reach acceptable IT penetration rates. However, the disparities remain. As central and more advanced regions in the EU invest in Next Generation Networks (NGN), there is an increased risk that more peripheral and thinly populated areas will be left behind. The lack of private investment in NGN outside large urban areas could lead to a renewed digital divide which could particularly affect many GEOSPECS territories.

In addition, demographic and social patterns are likely to influence people's awareness and to influence the adoption process. While the IS provides many opportunities in terms of territorial cohesion, these opportunities require not only connectivity, but that people are adequately informed about the possibilities of ICT and acquire specific skills. Supporting access to broadband without ensuring sufficient development of competences and relevant applications within administrations, companies and households may facilitate non-productive utilisation and increase competition with larger neighbouring regions. The use of ICT for small business and entrepreneurship is probably less about the dramatic gains of individual firms that have used it to re-orientate to the global market and more about its use to improve the function, process and quality of the business and consumer experiences in the local rural economy. This is particularly in traditional sectors such as agriculture, tourism, proximity services or arts and crafts.

While internet use in firms based in GEOSPECS territories has become increasingly necessary in order to stay digitally included and therefore competitive, ICT cannot in itself constitute a sufficient condition for socioeconomic growth. As in the USA during the 1990s, the benefits of ICT may not yet be observable because of the relatively slow take-up process in some GEOSPECS territories and the indirect returns of the IS. Nevertheless, as shown by some examples, particularly in Sparsely Populated Areas in northern Europe and some islands (Malta, Outer Hebrides, etc.), combined with other assets and drivers (human capital development, territorial attractiveness, smart specialisation, etc.), ICT are

likely to enhance structural adjustments and create new development perspectives in a longer-term.

The Information Society also provides many opportunities in terms of territorial cohesion and improvement of polycentricism at regional level. Some public services can be improved thanks to ICT, as long as these technologies are not used as substitutes to other forms of services in order to obtain short-term cost reductions. The ongoing demographic change and adoption of ICT will enable the full implementation of current pilot initiatives which contribute to increases in accessibility, inclusiveness and quality of life.

6.2.4 Residential attractiveness

Introduction

“The quality of life that a region offers can attract and retain the highly skilled people needed for regional competitiveness within today’s knowledge economy” (ESPON, 2006). This implies potential opportunities for territories in exploiting and enhancing residential attractiveness to overcome development challenges.

Definition of Residential Attractiveness: ‘Territorial attractiveness’ can be conceptualised as a quality of regions and cities that in many ways is a precondition for sustainable local development. It can be defined both as the capacity to attract new residents (or migrants), visitors, footloose entrepreneurial activity and investment as well as the ability to retain (and potentially develop) these mobile communities and assets.¹⁶⁸ Attractiveness is portrayed as a characteristic of regions that varies spatially according to its component natural and environmental, social, cultural and economic (endowment) factors¹⁶⁹. Territorial attractiveness can be seen as a composite term that encompasses the attractiveness of a region for both residents and visitors. While the concept of Residential Attractiveness focuses on the relationship between residents in a region and the assets of that region, the attractiveness to visitors is an element that also needs to form part of the analysis albeit in an indirect manner. Assets that may form the base of attraction for visitors may also be attractive to residents; however the fact that a region might attract a significant number of visitors might in itself serve as an inconvenience to residents.

Attractiveness can thus be conceived as the complex result of interactions between geographical attributes and a set of factors (themselves, possibly, the result of dynamic processes) that are set in a historic (path dependent) trajectory.

The principal categories of endowments are as follows:

- *Environmental Capital (EnC)*. Includes ‘given’ characteristics of the physical landscape as well as the result of environmental protection/regional planning actions.
- *Antropic Capital (AC)*. This would include man-made landscape elements, partly inherited from the past, partly the result of planning and conservation policies, which enhance the

¹⁶⁸ The Attractiveness of European regions and cities for residents and visitors ESPON ATTREG. The ATTREG Interim report submitted in 2010 has not been superseded by any new version at the time of drafting.

¹⁶⁹ The Attractiveness of European regions and cities for residents and visitors ESPON ATTREG

attractiveness and functionality of places for environmental and residential or tourist functions.

- *Economic Capital (EcC)*. This relates to conditions of the economic environment that induce a good business and productive climate.
- *Social & Cultural Capital (SCC)*. This includes assets and relational structures in the social / economic / cultural sphere that contribute to place quality and vitality.
- *Human Capital (HC)*. This reflects the characteristics of the workforce and labour market, and it is separated from social capital so as to distinguish problematic new geography concerns with 'soft' social structures from the 'hard' issues of human resources and skills.
- *Institutional Capital (IC)*. This refers to governance conditions that contribute to the effectiveness and justice of social and economic processes.

Thus, the capital stock of a region is a dynamic organism that follows developments in a number of interconnected elements. These elements, as well as the bi-directional influences between the capital stock of a region and its attractiveness can be strongly affected by governance.

Relevance of Residential Attractiveness to Territorial Development: The view inherent in many studies is that the larger the endowments of a region, the easier it is for that region to develop. However, while natural endowments are innate, their preservation and the proliferation of other types of endowments and assets are subject to influence by regional policy. Development has its own momentum, but policies can make a difference.¹⁷⁰ Numerous studies focus on the necessity of improving the 'economic environment' in regions that are considered as lagging, which is central to development policies. The concept of the 'economic environment', however, has changed over the years. Emphasis is being shifted from the quality of places as economic hubs to the concept of these also being people hubs and therefore need to be attractive to individuals as well as companies – whose decisions on the spatial location of enterprise goes hand-in-hand.¹⁷¹ Attractiveness and competitiveness go hand in hand, as attractive regions draw talented individuals and businesses which increase the competitiveness of the region.

Although it is possible to identify stocks of territorial capital, there is no absolute relationship between the presence of territorial capital and positive outcomes. This requires what has been termed a 'mobilisation process' to realise the potential of existing assets.¹⁷²

Review of relevant findings from the case studies

¹⁷⁰ Scenarios on the Territorial Future of Europe

¹⁷¹ The Attractiveness of European regions and cities for residents and visitors ESPON ATTREG

¹⁷² The Attractiveness of European regions and cities for residents and visitors ESPON ATTREG

Residential Attractiveness as a result of Geographic Specificity

The case studies brought to light a number of commonalities concerning the residential attractiveness of a number of particular geographical regions, most specifically sparsely populated areas, coastal areas, mountainous regions, islands, as well as border areas. A number of these attractions and deterrents can clearly be attributed to the region's characteristics and are therefore those aspects that policy makers need to consider when ensuring the viability and sustainability of these areas.

Excluding border areas, the most prominent heritage possessed by these regional specificities is considered to be their environmental capital. The beauty of their landscape and unique wildlife is a source of pride and is considered to be one of the main advantages of living in these areas. The preservation of these territories is even facilitated in areas that are sparsely populated. As a result, people who consider the environmental capital to be the most determining factor in choosing one's place of residence would opt to live in areas with low population density. Environmental capital is considered to be of even greater value for those regions that can boast of more than one type of landscape. The presence of mountains, coasts and islands as in the case of the Highlands and Sicily are an example of such locations.

Some of these regions can boast a rich history and culture that can be directly linked to their geographical specificity and whose heritage adds to the beauty of the locality. In the case of coastal areas, including islands, the presence of this cultural heritage partly came about due to the great importance attached to ports for trade purposes, in the absence of airfreight, making them much sought after by explorers, traders and invaders. In addition, the geographical location of some of these coastal regions and islands, such as Sicily and other Mediterranean islands, adds to the attractiveness of these locations. The better preservation of this heritage may also be linked to the peripherality of these regions from the main centre of activity and development.

The same argument is true of these regions' identity. More generally, a rich social capital in the form of preserved traditions, tight-knit communities and courteousness is considered an important factor for residential attractiveness. From the case studies it emerged that this characteristic is more predominant among the more insular regions, namely islands, mountainous regions and sparsely populated areas. On the other hand, border regions are more exposed to a variety of cultures. While some people view this as a rich cultural heritage in the form of diversity and multiculturalism that adds to the uniqueness and charm of these regions, others feel that the cultural differences of border regions create an obstacle to integration as a result of an identity-based behaviour that emerges.

However, their attractiveness can even cause new problems for some regions. With incomers, house prices rise. For instance the mountainous and island regions of Scotland, particularly areas close to commuting towns and cities, are experiencing exorbitant increases in house prices. This, as well as the lack of job and educational opportunities and the

relatively low per capita incomes, is often cited as one of the main causes of outmigration particularly amongst the younger age cohorts.

In fact, in a number of cases, these geographical specificities appear to be more residentially attractive to a specific group of older age cohorts. Apart from the lack of job opportunities and high costs of housing in some areas, the peripherality associated with a number of these regions may lead to perceived isolation, boredom and solitude that drives out youths. On the other hand, elderly people are more attracted to the beauty and tranquillity often associated with these areas and have less concerns about employment and educational opportunities. This has negative implications on economic activity, since businesses experience difficulties in finding the necessary human capital for recruitment, and puts pressure on the welfare system of the region since the dependency ratio may become unsustainable. As a result, a paradox appears to emerge whereby youths leave their hometowns in order to invest further in their human capital with this very migration being one of the causes of restrained economic activity.

Residential attractiveness is also impaired in regions where antropic capital is weak, such as in cases where transportation is either inadequate or expensive. Often these result from one another since the lack of infrastructural development leading to the inadequacy of transportation may be due to the high cost of servicing peripheral communities. As a result, goods and services tend to be costlier for these residents. This was particularly cited in the case of islands and sparsely populated areas. In addition, climatic conditions may raise the difficulties to travel or commute for work or pleasure for some regional specificities, particularly in the case of islands. The importance of reducing one's peripherality from a centre of economic and social activity has also emerged as a factor determining residential attractiveness as is cited in the Celtic sea (coastal area) and the Luxembourg border case studies. Research has shown that residents are more attracted to living in areas within their geographic specificity that are better connected to an urban centre. The importance of efficient transport systems is, therefore, vital.

A region may also be residentially unattractive as a result of its poor institutional capital, often reflected in an inefficient judicial process and the emergence of unofficial governance structures due to the region's insularity. Although this may be true, it was only cited in one case study which could imply that regional differences in governance are not a central determining factor in one's residential choice.

Links between Economic Growth and Residential Attractiveness

The beautiful natural landscape of a number of these geographical specificities is perceived as one of the main attractions for tourism and, as a result, can lead to an economic advantage and avenue for further development and job opportunities. Individuals residing in different regions within the country are also attracted to purchasing holiday homes in these areas for recreational and relaxation purposes. This is particularly important in the current economic climate where tourism has been hit hard by the downturn and where domestic tourism, which is often cheaper, can cushion this decline.

Although there are economic advantages associated with this, the resultant environmental pressures due to the large population increase during the holiday periods may outweigh these benefits. This often takes the form of significant problems related to the provision of a number of services including water supply and sewage treatment, as well as landscape intrusion such as the proliferation of septic tanks and groundwater pollution, increased car traffic and urban sprawl. In addition, these touristic areas, such as coastal regions, end up being characterised by an overabundance of “ghost” estates in the winter months.

Due to the insularity, remoteness and often small population size of some of these regions, investors are frequently faced with difficulties – both logistic and cost-related – in setting up shop in these areas. The limitations pertaining to the size and diversity of the labour market in these regions are often cited as among the most problematic. This arises from the difficulties encountered in the pursuit of furthering one’s education and bettering one’s skills. As a result, economic diversification is often limited with seasonality characterising some of the most popular sectors, particularly tourism and agriculture. In addition, the peripherality of a number of these regions makes commuting for work very difficult.

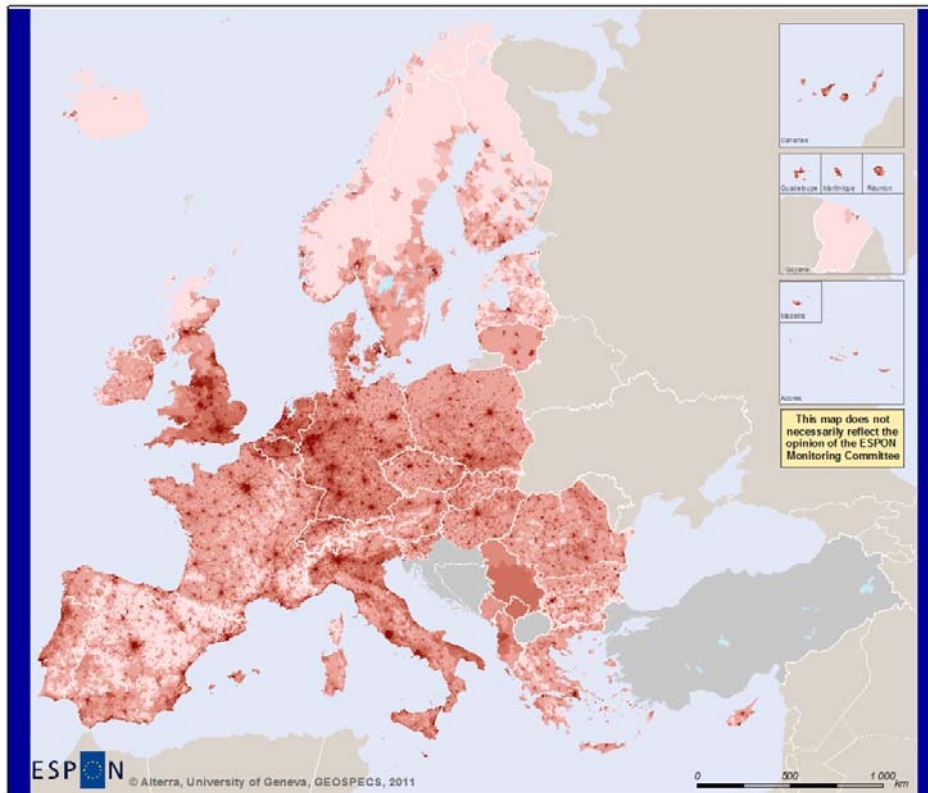
Therefore, although these geographically specific areas may have a comparative advantage in some types of capital, for instance environmental, the sustainability of these regions would be achieved through a greater balance whereby this is supplemented with economic, human and institutional capital development in order to maintain living standards and the well-being of its residents.

Quantitative evidence

The following paragraphs use the datasets collated in this project to analyse the concept of residential attractiveness. Using data on population, weather and employment, inferences about the different classes of assets described above and consequently on the potential of areas with geographic specificities to exploit residential attractiveness as a means to development are derived.

The map below displays the levels of population density in the ESPON area. Coasts in Europe are densely populated compared to the rest of the mainland. The effect of population density on residential attractiveness can be both positive and negative. In general, places with a lower population density convey a greater sense of peace and space that is often sought by individuals in their residential choices. On the other hand, locations with substantial population density act as hubs and have the advantage of offering a greater variety of a number of important factors such as employment, lifestyle, entertainment and links to the rest of Europe. The areas that fare the best in this trade-off are those that have enough of a population density to offer the benefits of such an agglomeration of choices but are also able to afford residents the separation, peacefulness and other benefits that accrue from lower population densities.

LAU2 population densities



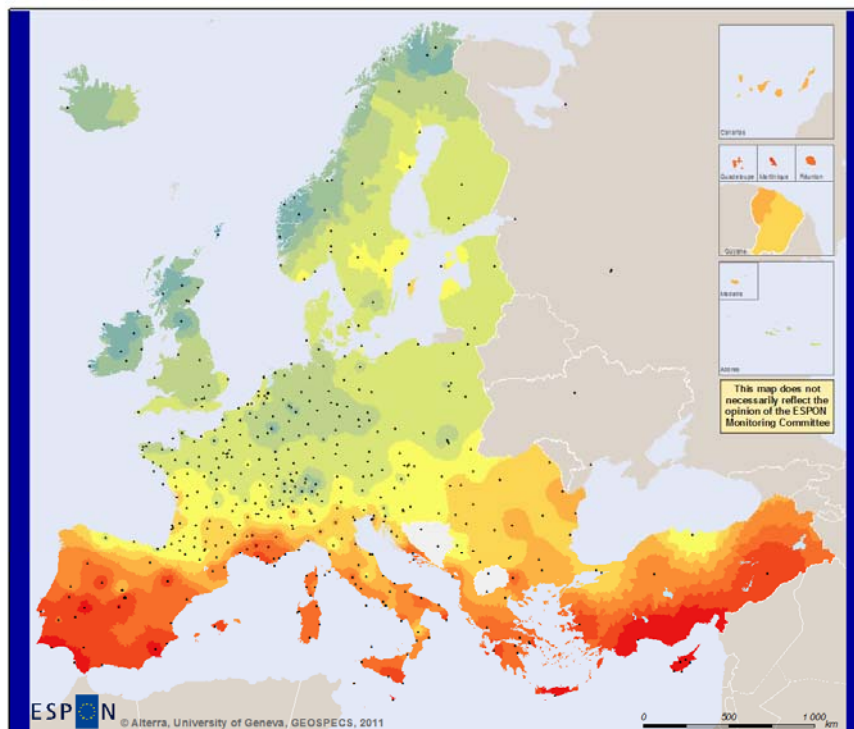
LAU2 population densities (inh./sq.km.) (2006)



Map 63 Population Density

The climatic conditions of areas are a strong contributor to enhancing the environmental capital of that area and therefore increasing its residential attractiveness. The map below outlines the mean sunshine duration per annum of the ESPON area. Warmer climates are generally perceived to be more attractive than colder ones, however, many locations have successfully exploited their climates, both warm and cool to increase their attractiveness. A firm comprehension of how a territorially diverse area may integrate the opportunities presented by climatic conditions, whether for the improvement of recreation, employment or housing capital is necessary for the optimal progress and development of these areas.

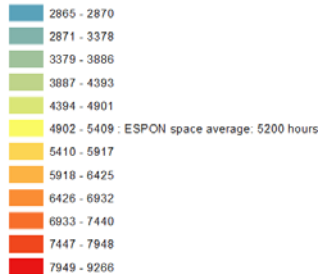
Yearly sunshine duration



EUROPEAN UNION
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Regional level: LAU2 (except Turkey LAU1)
Source: GEOSPECS, 2011
© EuroGeographics Association for administrative boundaries
except Western Balkans and Turkey (national sources)

Yearly sunshine duration (number of hours per month)



Non-ESPON space
ESPON Space

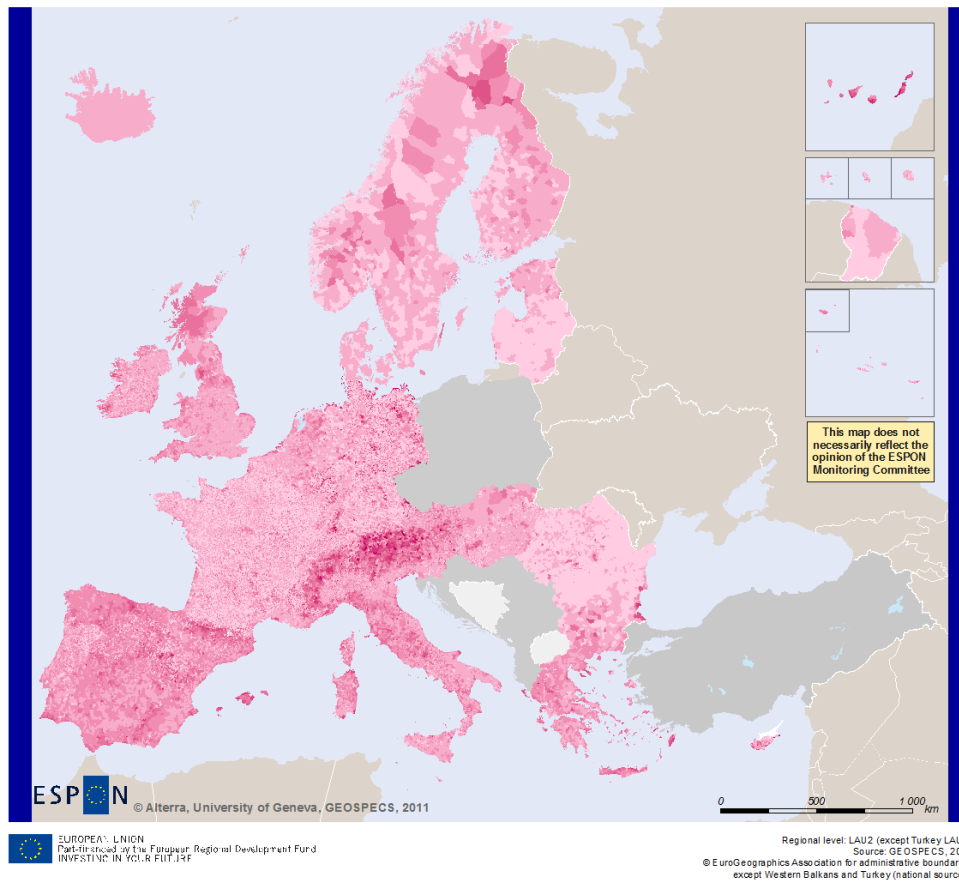
Measurement points from which
LAU2 data have been interpolated

Interpolation of 497 measurement points
gathered from four different data sources.
Data correspond to sunshine durations
between 1981 and 2001.

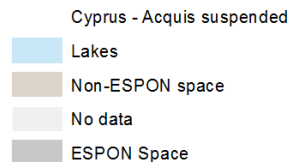
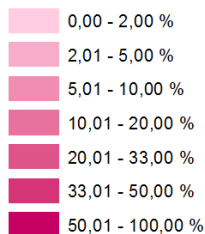
Map 64 Yearly Sunshine Duration

Areas with special geographic features, such as coasts, mountains and islands, often find that their environmental and cultural capital lend themselves well to the tourism industry. The map below presents the percentage of people employed in hotels and restaurants in the municipalities. This data is often used as a proxy for the employment in the tourism industry. This figure is visibly higher in the mountainous areas in Europe as well as the coastal areas and islands. The benefits of a strong tourism industry should not be pursued without regard to the impacts this has on residents of the areas. Policy designed to develop an area's residential attractiveness needs to find the balance between these sometimes conflicting needs.

Relative importance of "hotels and restaurants"



Proportion of gainfully employed persons in "hotels and restaurants"



Austria (1999), Turkey, Estonia, Greece (2000), Portugal, United Kingdom, Northern Ireland, Italy, Lithuania, Spain (2001), Romania (2002), Germany (2003), Finland (2004), Iceland (2005), Ireland, Norway (2006), Sweden (2006), Malta, France (2007), Hungary, Luxembourg, Netherlands, Slovenia, Denmark, Bulgaria, Switzerland, Belgium (2008), Slovakia, Liechtenstein (2009), Latvia (2010), Cyprus (2003-2006).

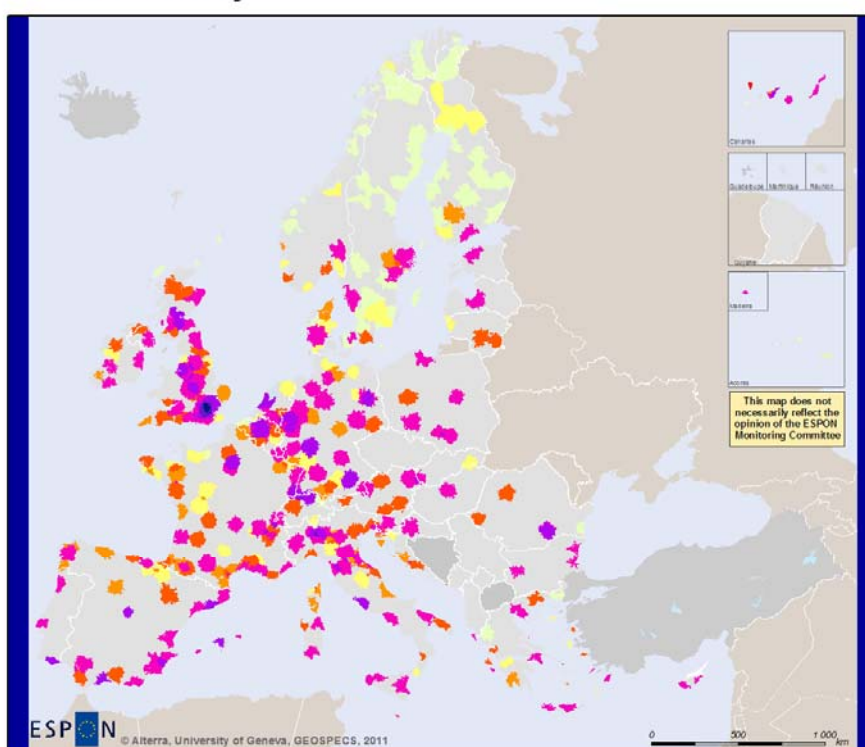
All local figures have been adjusted on the basis of NUTS 0 figures for 2008 from Eurostat and from the Turkstat.

Map 65 Employment in the Tourism Sector

The connectivity between an area and the rest of the continent is a central consideration when individuals make their residential location choices. The ability to access airports is a key variable in the analysis of connectivity. The importance of airports is particularly highlighted for geographically specific areas such as border areas, islands and mountains, which may have limited access to other modes of transport. The map below displays the

number of airlines¹⁷³ accessible within a 45 minute travel time of each locality. While islands and coasts appear to be well serviced by air, a number of geographically specific areas such as border areas and some mountainous areas are not serviced by any large airline, and have to rely on smaller air providers or on the use of rail and ferry transport in order to reach larger hubs that are serviced by such airlines. This highlights the importance of antropic capital in the form of infrastructural links. The investment in road networks, airports and other transport hubs are vital for an area to develop its residential attractiveness. Remote areas without such links may overcome these difficulties, however, if the remoteness is exploited to target industries and individuals for which it is an asset. This is the case in sports tourism and in the creative arts.

Air connectivity



Cumulated population potentials (2006) of airports that can be reached with non-stop flights from airport(s) that are accessible within 45 min

- No airport within 45 minutes
- 1 to 10 million
- 10 to 30 million
- 30 to 50 million
- 50 to 100 million
- 100 to 300 million
- 300 to 600 million
- 600 to 900 million
- 900 to 1 300 million

- Cyprus - Acquis suspended
- Non-ESPON space
- ESPON Space: missing data

The figure should be interpreted as an indicator of intra-European accessibility, and not as a number of persons that can be reached with non-stop flights.

Populations at destinations with multiple airports are counted multiple times.

Map 66 Air Connectivity

¹⁷³ With over 15,000 passengers per year

The paragraphs above have looked at different elements of attractiveness through the use of different proxy variables. The capital type that contributes to the attractiveness of a region is spread across the ESPON area, with different regions having different elements of attractiveness, no region is strong in all capital types. This results in differences in the potentials in different regions.

Summary and conclusions

The concept of residential attractiveness presents policy makers with an opportunity to comprehend the different composite parts that come together to make different areas a draw for people to reside in. This is especially vital for areas which have inherent characteristics that make traditional routes to development more challenging. Areas with geographic specificities are often richer in different types of capital than central urban areas. Their strengths typically lie within the environmental capital, and the cultural and social capital fields. The paragraphs above highlight that the particular potentials of an area will vary, not only depending on the geographic specificity at play, but also on the location within Europe, the country and other important determinants of residential capital.

The focus of development plans and policies for these areas should recognise these assets and the potential for using them as a path to growth. Territorial cohesion is not about turning Europe into one big city, but rather about allowing the diversity within territories to flourish and support the development of these territories. Levelling out different spatial characteristics between regions would in fact result in a European territory without distinctiveness, without attractiveness, losing regional identities.¹⁷⁴

Current European policies do not explicitly refer to the concept of using residential attractiveness to stimulate development. There is the potential for the introduction of this concept, on a number of policy levels. The existence of the range of variety of assets in territorially diverse areas suggests that the specific targets for the development of these assets rests on a local level, and therefore policy that aims to exploit these assets should pursue a bottom up approach to development based on residential attractiveness. The presence of top-down coordination and support needs to exist concurrently with such bottom-up approaches.

Development policy for GEOSPECS areas within the EU territory could be suggested by an overarching body, such as the European Commission, that could provide guidance as to how GEOSPECS areas can contribute, through their competitive residential advantages, to the EU as a whole. A top-down approach results in a better understanding of those activities which have proven to be more successful in enhancing attractiveness of GEOSPECS areas. The coordination of the top-down approach could be carried out by DG Regio in order to identify synergies and bring in other expert knowledge. The European market left to its own devices is not

¹⁷⁴ Territorial Cohesion and Spatial Planning, Bussadori, V.

likely to bring this to happen autonomously due to market failure in undertaking such activities and therefore there is strong justification for policy intervention. However, due to the diversity of the areas in question, and their different potentials, a bottom-up individual or cluster basis approach is also needed. These should be encouraged to prepare development plans that incorporate strategies on how best to exploit their residential assets and develop this potential more fully.

This approach to developing policy can be neatly summarised in the diagram below, where the two approaches come together and bring together funding instruments, regulatory instruments, evaluation activities and monitoring activities.

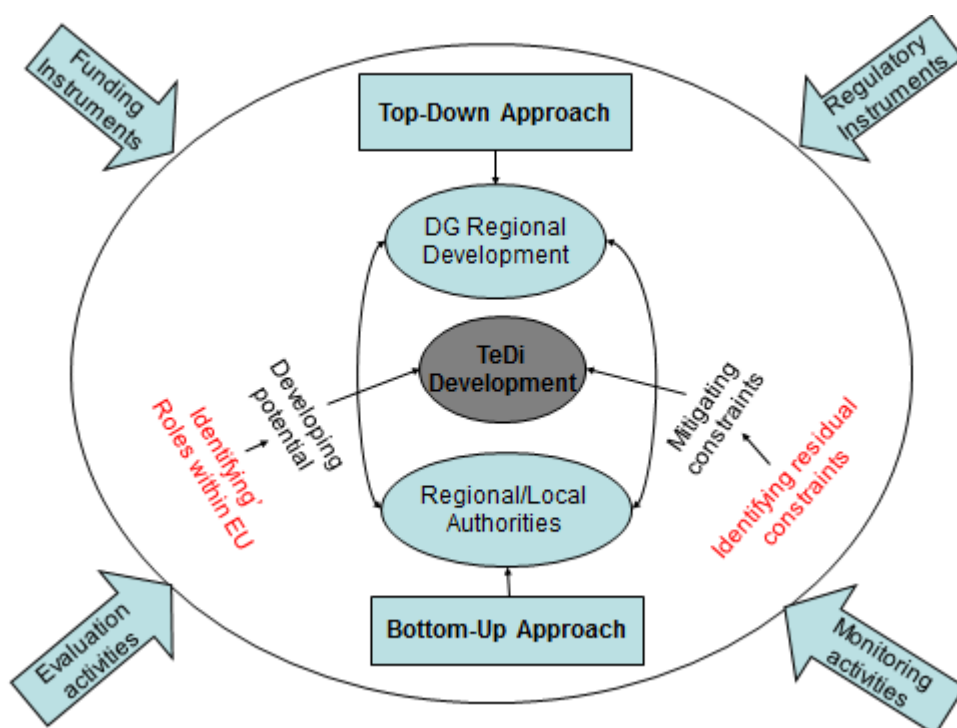


Figure 62 Policy Approach

The potential for a number of GEOSPECS areas to develop through their residential attractiveness should be kept at the centre of EU regional policy. The changing paradigm of GEOSPECS areas as places that can find their place within Europe as contributors to development is overcoming the past belief that such areas were to be considered as permanently problematic and can only be supported financially to compensate for such inherent territorial disadvantages. The future for GEOSPECS areas, and for the preservation of their capital and population is the transformation into areas that tap into this potential and flourish on the very base that makes them territorially unique.

6.2.5 Biodiversity and protected areas as factors of development

Many GEOSPECS areas are hotspots of biodiversity and/or host a comparatively high number of protected areas.

Mountain areas: Most 'hotspots' of biodiversity in Europe are in mountain areas (EEA, 2010). A number of factors interact to cause these high levels of biodiversity, including the compression of thermal and climatic zones over relatively short distances, steep slopes, variations in geology and soils, and the fragmentation of mountain terrain. In addition, many mountain areas are isolated from one another so that species have evolved separately - a major reason for the high levels of endemism in many mountains, including those on islands. Millennia or centuries of human intervention have also been important for maintaining populations of many species and particular habitats in spatially diverse cultural landscapes.

Mountains also host a particularly high proportion of protected areas. For instance, of the total area designated as Natura 2000 sites in the EU, 43 % is in mountain areas, compared to 29 % for the EU as a whole. These sites cover 14 % of the mountain area of the EU (EEA, 2010).

Islands: More than any other type of territory, islands are isolated. Over time, this isolation permits unique evolutionary forces that result in the development of a distinct genetic reservoir and the emergence of highly specialized species. As a legacy of this history, many island species are endemic. Islands harbour higher concentrations of endemic species than continents, and the number and proportion of endemics rise with increasing isolation, island size and topographic variety. However, island species are therefore also particularly vulnerable: of the 724 recorded animal extinctions in the last 400 years, about half were of island species. In the same period, at least 90% of the bird species that became extinct were island-dwellers (CBD, 2009). Within Europe, islands (which are often mountainous) have particularly high levels of endemic species (EEA, 2010).

Some islands are too small for human habitation and therefore host a number of species which have been able, and continue, to evolve undisturbed; often, such islands have been designated as protected areas. In contrast, species and habitats on some touristic islands (particularly in the Mediterranean and other popular tourist destinations) face high pressure from the expansion of infrastructure.

Sparsely Populated Areas: By definition, sparsely populated areas are well suited for the establishment of large-scale protected areas, as the potential for conflict with other land uses is less. For example, the largest

national park (and also biosphere reserve) in the world is situated in Greenland.

Establishing protected areas in regions where human activity is generally low is often a question of convenience, and not necessarily because of high levels of biodiversity. As Dudley (2008) points out: "although the rate of growth [of protected area systems] has been impressive, many protected areas have been set up in remote, unpopulated or only sparsely populated areas such as mountains, ice-fields and tundra...".

Coastal zones: Coastal ecosystems face high pressures. As a transition area between land and the sea, they host homes and workplaces, industries, holiday destinations and recreation areas. In EU countries with a sea border, almost half of the population lives in coastal areas. Coastal habitats are being destroyed to make way for housing, industry, agricultural land, and infrastructure for tourism and transport. They are also affected by a wide range of pollution sources, and sea level rise makes them particularly vulnerable to climate change (EEA, 2010a).

Coastal areas are very important habitats. In particular, their wetlands provide key feeding areas for species of migratory birds. About 50 coastal habitat types and 150 species that prefer coastal ecosystems (other than birds) are listed in the annexes of the EU Habitats Directive. However, two-thirds of coastal habitat types and more than half of coastal species have an unfavourable conservation status (EEA, 2010a).

Progress in extending the Natura 2000 network has been significantly slower in the marine environment than on land (EEA, 2010d). Most of the designated marine Natura 2000 sites — approximately 75 % of the designated area — are located within 12 nautical miles of the coast, but a coherent network of offshore areas is lacking. In addition, the marine network is much less comprehensive than the terrestrial one: in 2010, marine sites accounted for only 20 % of the total designated area in Europe (EEA, 2010d).

Outermost regions:

Outermost regions are rich in biodiversity and have more endemic species than the whole of continental Europe (European Commission, 2010). As they are situated in other biogeographic zones than continental Europe, their habitats and species are markedly different.

A report for the Commission's DG MARE points out: "The outermost regions are concerned about the consequences of the loss of biodiversity as this is an economic growth factor, tourist attraction and an important element for human well-being. Coral reefs for example have a huge influence on the life of people in some of the outermost regions. They function as natural breakwaters along the coasts and represent one of the most important natural resources for food, beach sand and building

materials. These corals are being threatened by sea level rise, a rise in sea surface temperature and an increase in extreme weather events. Martinique for example, has lost in specific sites about 30% of its coral reefs within one year (2005-2006). Furthermore, due to the increase in sea surface temperature many species of Martinique will likely have to migrate to the north where the sea surface temperature is more moderate." (Policy Research Corporation, 2009).

Border areas: Border areas are often favoured in terms of biodiversity, partly as a result of their peripheral location and/or political factors in the past banning the development of these areas. "Borders run traditionally along rivers, mountain and maritime ranges, the most suitable places for the evolution of the ecosystems. In addition, many borders were forbidden areas for tourism, travel and economic activity for several decades. Ecosystems were able to develop undisturbed and untouched during that time" (TSPEU, 2011). For example, the former Iron Curtain is now covered by an ecological network called the "European Green Belt", 8,500 km long. Within this zone, economic development was interrupted by forced land abandonment and restructuring of landscapes for military infrastructure. The network provides a cross section of Europe's major ecosystems, and includes national parks, nature parks, and biosphere reserves (TERRY et al., 2006).

As many (comparatively) untouched areas are situated along borders, these areas lend themselves to designations of "transboundary protected areas" (see WORBOYS et al., 2010); the International Union for the Conservation of Nature has a task force on this topic, and the "Europarc" Federation has certified 15 European transboundary parks (www.europarc.org).

Valuing biodiversity

The idea of putting a monetary value on biodiversity is fraught with difficulties, both moral and methodological. Most commonly, the different types of values deriving from biodiversity are conceptualised as ecosystem services. Ecosystem services are the benefits people obtain from ecosystems (MA, 2005). The different categories of services and values are well-summarized in the figure below (WATTAGE, 2011):

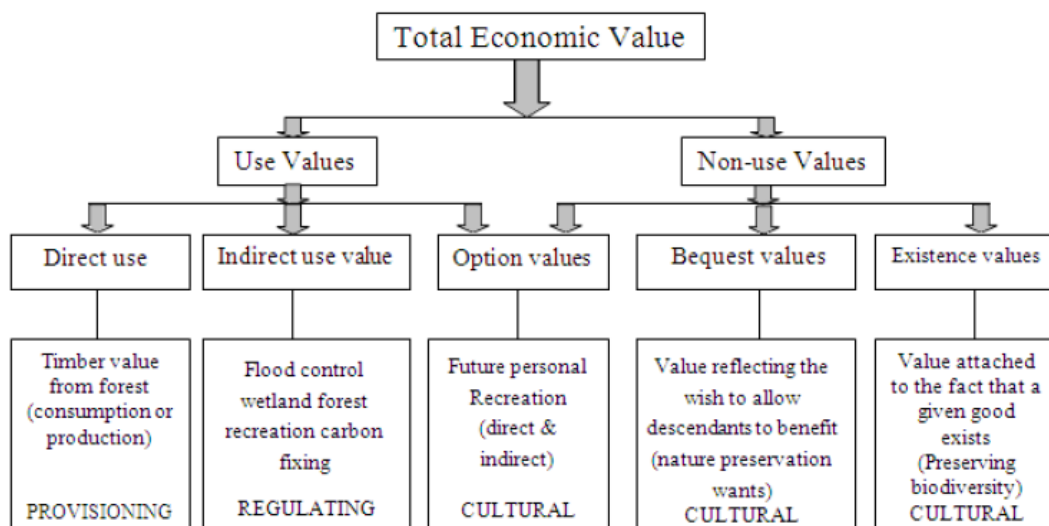


Figure 63 Ecosystem services: categories and values

However, even with such a categorization, the methods of actually putting a price tag on these services are controversial, particularly so for the more abstract values (e.g., existence values, option values). Assigning pecuniary values is obviously easiest for interactions with nature that create a measurable cashflow. One aspect of this relates to direct use values (e.g. the extraction of timber from a forest which obtains a price at the market). As the *exploitation of natural resources* is the focus of another transversal theme of GEOSPECS, these are not addressed further in this section. In addition, measurable cashflows are created by *tourism*. Even though the recreation value that an individual personally derives from visiting a “beautiful” landscape (or indeed the health value s/he obtains from walking/skiing/swimming) is almost impossible to quantify, the money that is spent for access to, accommodation in, and recreational activities undertaken in an area can be measured. This is the principal way in which the assets of many “natural” areas have been valued; while the values of other important ecosystem services – such as flood control, carbon sequestration or nutrient cycling – have been rarely quantified, and even less have such measures been used as the basis for policy-making or transfer payments.

As noted above, many GEOSPECS categories support high levels of biodiversity. As such, they also play important roles in the supply of ecosystem services. This is especially so given that the concept of ecosystem is broader than only living organisms, as it also comprises (abiotic) physical components of the environment with which the organisms interact. One example is the role played by a biologically diverse ecosystem which stabilizes a steep slope (SPEHN et al, 2010).

It is unrealistic to try to quantify the economic impact of ecosystem services in Europe – be it in GEOSPECS areas or otherwise. However, it is important to note that some GEOSPECS areas provide particular – vital – services to the entire European territory that can *only* be “produced” there. This is perhaps most intuitively clear for mountains and coasts.

Mountain ecosystems play a key role in the water cycle for Europe as a whole. They influence temperature and precipitation patterns, and modulate the runoff regime. Water from both rain and snow is stored on and in mountain vegetation and soils and gradually released. It transports sediments downstream, providing nutrients for lowland areas, replacing fluvial and coastal sediments, and contributes to groundwater recharge in lowland areas (EEA, 2010b).

Coastal ecosystems have always played important roles in providing food to humans, not only by directly generating a variety of seafood products like fish, mussels and crustaceans, but also by providing nursery habitats for many commercially important marine species (MA, 2005). Other services include shoreline stabilization, bioremediation of waste and pollutants, and a variety of aesthetic and cultural values (European Commission, 2011).

A sparse populated area does not in itself generate any particular ecosystem services, though their great extent is often related to the large-scale supply of water, often used for energy production. Also, some ecosystems mainly occur where there are no or few people. Forests shall serve as an example. It is intuitively clear that large expanses of forests are only found where there is little human settlement. Forests protect soils from erosion, and regulate watersheds and local hydrological systems by reducing variations in water flows. They regulate the local, regional and global climate, store carbon, and purify air and freshwater. They produce wood and non-wood products, and are also part of our cultural and historical heritage, and represent key locations for outdoor recreation and leisure (EEA, 2010c).

Most of the ecosystem services particular to islands were already described in the section on coasts. For border areas it is not possible to speak of “particular” ecosystem services, as borders are not a particular ecosystem but can be found in any ecosystem.

Lastly, how do Protected Areas factor into this discussion? Protected areas are first and foremost a way to *protect* (or more globally: *manage*) biodiversity. In addition, they also ensure the continued flow of ecosystem services (not only within the protected area itself, as the wider benefits of these services are often also felt outside). As above, those managing protected areas are not compensated financially for the maintenance of the most important ecosystem services, nor for the preservation of biodiversity for future generations. As industrial or extractive activities are

often restricted in these areas, a common way to make money from the designation as a protected area is marketing for tourism purposes.

Questions:

Are GEOSPECS areas associated with higher levels of biodiversity (or indeed with a high number of protected areas, as these should be indicative of the presence of important species and habitats)?

Are there examples where a protected area or a particular species has had a key role in either attracting high numbers of tourists or in otherwise creating economic benefit (income) for the area? This does not focus on the exploitation of natural resources, as these are a separate transversal theme of GEOSPECS.

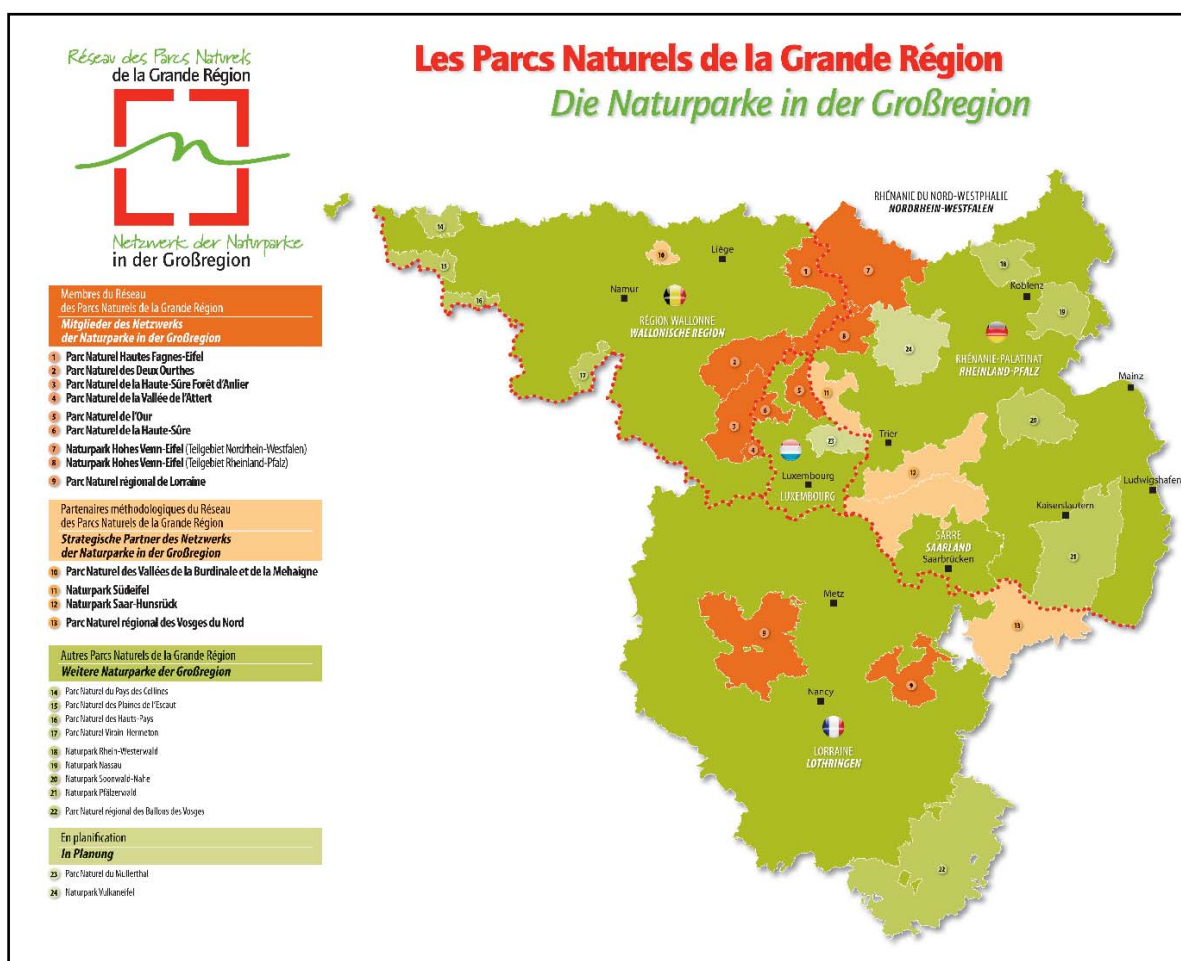
Review of relevant findings from the case studies

Biodiversity and protected areas in GEOSPECS areas

A number of the case studies show that that levels of biodiversity (and numbers of protected areas) are higher in GEOSPECS areas. The location of the Canary Islands, less than 100 km off the African coasts, their multiple climatic influences and thus micro-climates, as well as the territory's fragmentation, make them a place of invaluable interest in terms of biodiversity. The island of Gran Canaria alone, for example, hosts half of the species that are unique to Spain. The Canary Islands are extensively protected, with 42% of the area designated as "park" or "reserve". Four of the 14 Spanish national parks are located in the archipelago.

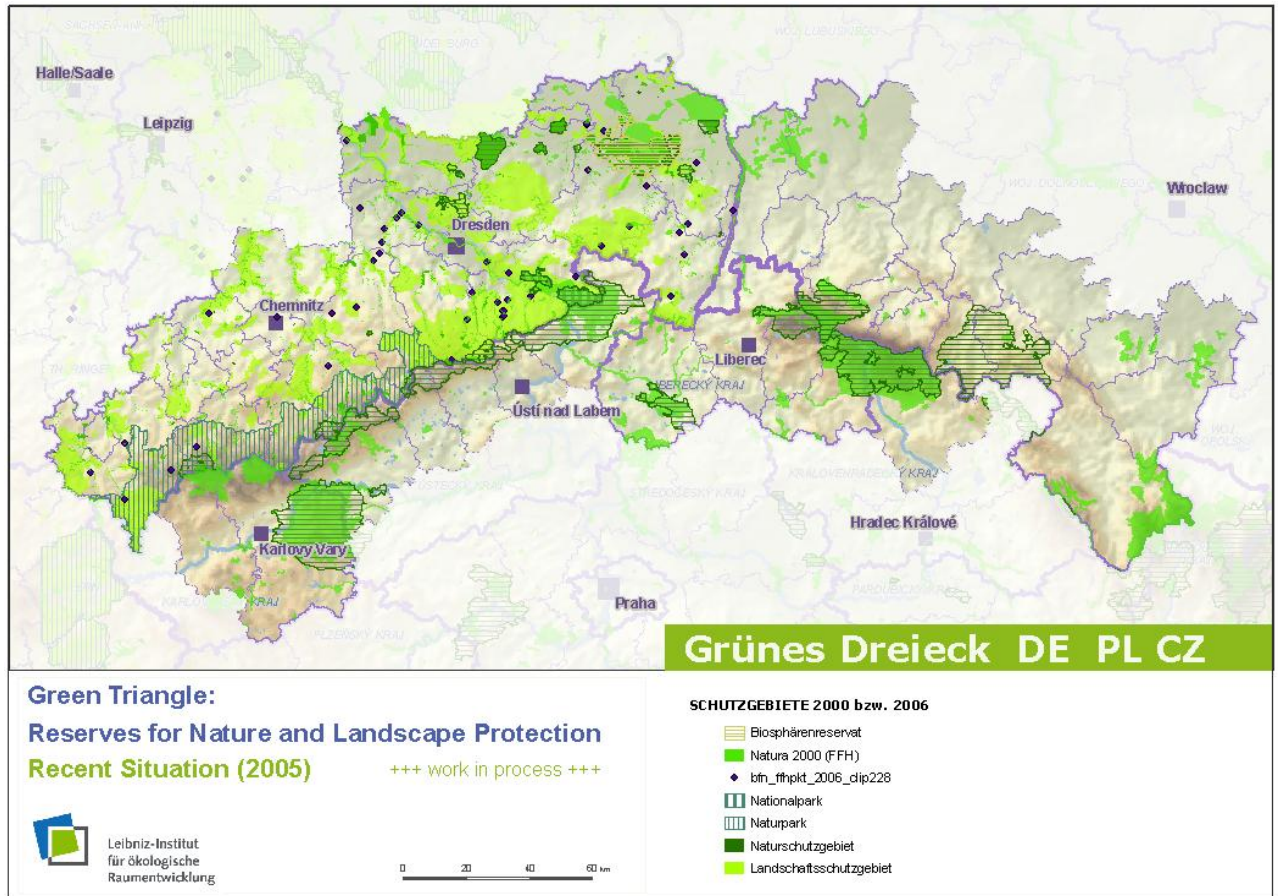
Both the Tatra mountains and the West Stara Planina feature a high number of diverse habitats, due to the compression of different thermal and climatic zones over relatively short distances. Both are home to many endemic and relict species. Particularly in the case of the West Stara Planina, the presence of the state border (between Bulgaria and Serbia) also plays an important role in explaining this high biodiversity. The border areas have been only slightly affected by human activities because of the guarded regime in the border zones that existed until recently (YORDANOVA & MATEEVA, 2011).

In the Greater Region (the area around Luxembourg), 15 out of the 22 Nature Parks are adjacent to a border (Portail de la Grande Région 2011):



Map 67 Nature parks in the "Grande Région"

Similarly, in the "Black Triangle", the border between Germany and the Czech Republic is almost covered entirely by a protected area at least on one side of the border (sometimes on both). Nevertheless, this border coincides almost entirely with a mountain range (Erzgebirge and Elbsandsteingebirge), so that this long stretch of protected areas cannot be exclusively attributed to the presence of the border.



Map 68 Reserves for Nature and Landscape Protection in the border triangle between Germany, Poland and the Czech Republic

In both coastal case study areas, levels of biodiversity are high, but the pressure from human activities somewhat limited the drive to extend protected areas in the past (see also below). The Belgian coast comprises a diverse range of geological features that form important habitats. The offshore environment contains a sequence of sandbanks in the shallow sea; onshore, the coast mainly comprises sandy beaches, mudflats, salt marshes, sand dunes and polders (HERRIER et al., 2005). In the Irish Sea, the marine environment provides habitats for many fish, seabirds and marine mammals. The coastal areas contain a diversity of habitats such as dunes, machair, salt marches, lagoons, mudflats to tidal and sub-tidal areas that support unique plant and animal communities.

In both Tornedalen and the sparsely populated areas of Spain, the low presence of human activity has contributed to the preservation of an “unspoiled” landscape, even if levels of biodiversity are not particularly high in comparison with other areas in Europe.

Can protected areas / particular species contribute to development in GEOSPECS areas?

The potential economic impact of protected areas (or even particular species) varies. While some play an important role in attracting tourists, others only contribute marginally.

Among the more successful examples, the Zwin tidal inlet at the Belgian Coast is of economic importance as one of the most popular birdwatching areas in Belgium (DEVOS, 2008). In some remote coastal areas of Western Scotland, whale watching is a tourist attraction (PARSONS et al., 2003). "Consumptive" uses of biodiversity attract tourists as well: it has been estimated that shooting activities in Scotland (grouse shooting, deer stalking, etc) contribute £240 million pounds to the Scottish economy (THE ROYAL SOCIETY OF EDINBURGH, 2008), while anglers are said to spend £42 million in the Highlands per year (SCOTTISH EXECUTIVE, 2004).

In most cases, however, it is not a single species that attracts visitors, nor will a protected area profit from tourism purely because of its designation. Rather, a number of factors interact to create a particular image of an area. The Tatra Mountains, for instance, are an extremely popular tourist destination, with 3 million visitors annually on the Polish side and 4 million annually on the Slovakian side (and tourism being by far the most important economic activity in the area) (DUDLEY, 2011). The image of the area as an attractive natural mountainous landscape, with opportunities for hiking and skiing, is certainly *underscored* by its designation as national parks and by its unique fauna, but these factors are only two out of many that create this image. Similarly, the Elbsandsteingebirge along the German-Czech border (better known as *Saxon Switzerland* and *Bohemian Switzerland*) has been traditionally a popular hiking and climbing area, and derives much of its fame from its distinctive sandstone rock formations – even if the designation as a national park in 1990 has doubtlessly contributed to the area's visibility and image.

One study has tried to determine the importance that designation as a national park plays in attracting visitors to an area. The Cairngorms National Park (situated in the Scottish Highlands) receives more than a third of its Gross Value Added from tourism. Income from tourism is said to have grown "perceptibly" around the time of designation as a national park in 2003 (Cairngorms National Park Authority, 2010). According to a survey, 52% of visitors to the park claim that National Park status was "very" or "quite" important in their decision to visit the area (Cairngorms National Park Authority, 2010a). A similar survey among enterprises in the park confirms this, with two-thirds of business owners stating that national park status was quite or very important in attracting their visitors (Cairngorms National Park Authority, 2011a). Nonetheless, tourism in the area had existed previous to designation as a national park.

In the Outer Hebrides, designation as a national park is seen as an opportunity to "reverse depopulation". The people of Harris have asked

the Scottish government to designate their island as Scotland's third national park. A local hotel owner is quoted as saying: "The national park would offer new opportunities. It would increase tourism and related employment. It would persuade people to have more pride in the island environment and encourage their children to come back to Harris in the future" (Herald Scotland, 2009).

While the attraction of tourists is the most important measurable economic impact of a protected area, it is not their only role. In the Torne valley region, protected areas play a part in the continuous growth of forests, one of the most important natural resources of the area. In the Irish Sea, Marine Protected Areas are deemed necessary to allow for the recovery of severely diminished fish stocks. Both of these are good examples of ecosystem services. Nevertheless, the number of studies trying to quantify the monetary value of ecosystem services is still limited. For example, it has been estimated that the service of water provision from the Polish Tatra National Park is equal to an annual value of €3.7million (GETZNER, 2009).

Conflicts

Unsurprisingly, the most conflicts arise in areas where there are the most human activities. This finding is certainly not exclusive to areas with geographic specificities, but it *also* applies to them.

The case studies offer a number of illustrations. Sicily is an island with a high population density, and population tends to gravitate towards the coasts (where the tourism sector promises employment). Around 10% of the area is protected as parks or nature reserves. People do not seem to look favourably upon protected areas, which are deemed to hinder development (particularly the spreading of touristic and other infrastructure). For instance, in Isola Bella – an island that is entirely designated as a nature reserve – there is a continuous spread of unauthorized construction, such as pools around private residences, fences and signs marking the protected area are removed, and the use of motor boats in shallow areas damages marine fauna, as does aggressive fishing. Different regional bodies (mainly the Regional Department of Land and Environment and the Department of Cultural and Public Education) have been known to clash over these issues in Sicily.

In the Cross-Border Metropolitan Regions Luxembourg and Geneva, urban sprawl covers a large proportion of the land and, at the same time, leads to fragmentation of natural areas. The widespread use of private cars for commuting results in air and noise pollution. In Geneva, it is not just the expansion of urban areas that is seen to affect natural areas, but also vice versa: the presence of a large area of agricultural land protected by Swiss

federal law has been seen as a constraint to urban development, resulting in urban growth being “displaced” to the French side of the border.

In Tenerife, a major economic project - the construction of an industrial port in Granadilla, worth 380M€ - was stopped by a regional court in 2009, because it impinged on beds of protected seaweed located nearby.

The Belgian Coast is particularly densely populated, due to not only numerous employment opportunities in the logistics/transport sector, but also its attractiveness as a living space. The many important habitats along the coast are often interrupted by artificial coastal protection structures such as dikes and seawalls, and other structures such as buildings and roads (HERRIER et al., 2005). Activities such as fishing, shipping and exploitation of mineral resources also put pressure on the coastal habitats. Of the terrestrial systems, salt marshes and sand dunes are most vulnerable. Only two salt marsh regions remain on the coast. One is the *Zwin* tidal inlet, itself in danger of complete siltation due to past beach replenishments at Knokke-Heist in the 1970s and 1980s, and the construction of new container terminals in the adjacent harbour of Zeebrugge (DEVOS, 2008).

In the Irish Sea, industrial fisheries have reduced the stocks of a number of fish species to a fraction of their previous volumes. Some models suggest that the Irish Sea cod stocks, for example, may disappear by 2100 (ROBERTS et al., 2003). Habitats in the Irish Sea are rapidly being transformed and even destroyed by fishing gear such as trawls and dredges. Coastal habitats are suffering from nutrient runoff caused by farming practices.

This is not to say that other areas do not face conflicts. For instance, in the very sparsely populated Scottish Highlands, the intention to expand wind turbines and wind parks is regularly limited by protected areas. In the Slovakian Tatra National Park, the proposal to extend ski slopes and ski resorts into highly sensitive habitats has caused strong opposition from environmental organizations (WWF, 2008).

Nevertheless, the emerging picture is that areas that face the most demands from different interests (as a living space for endangered species, or for humans; as sites of industrial production or exchange of goods; as sites for the generation of energy; as spaces for tourism and recreation, etc.) are the most prone to conflicts.

Quantitative evidence

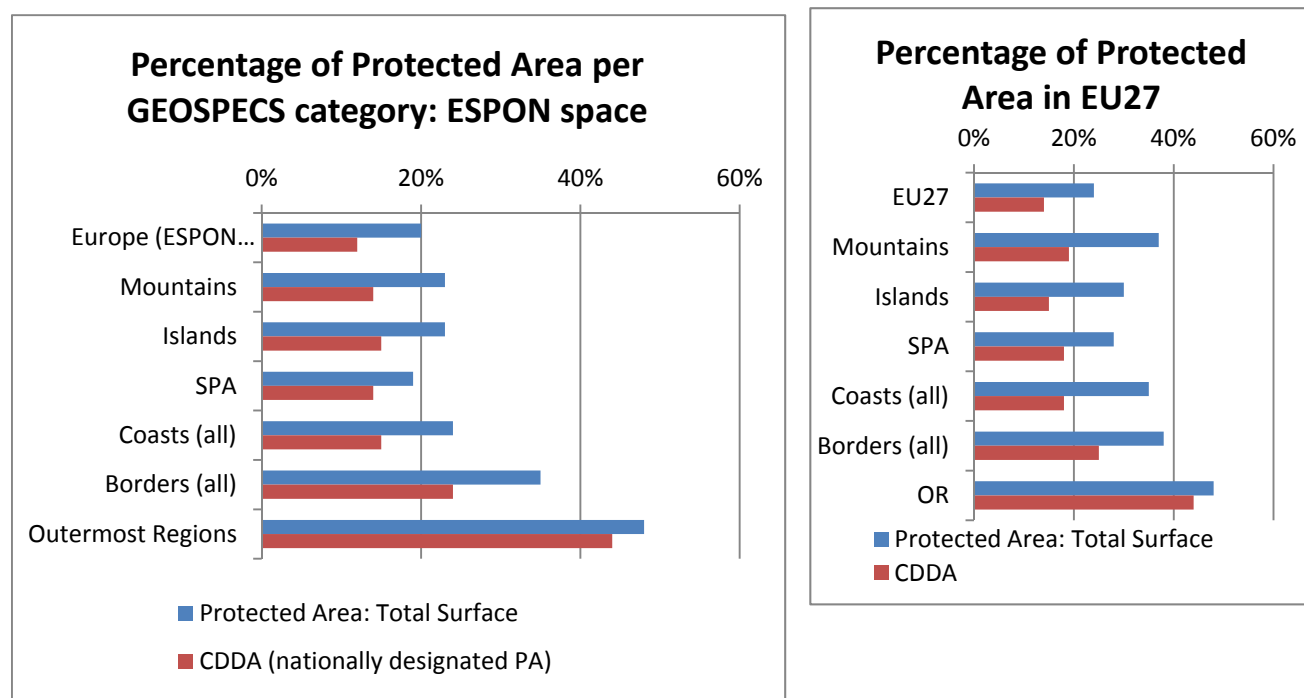


Figure 64 Protected Areas per GEOSPECS category: percentage

The quantitative evidence confirms the conclusions above: the total percentage of the surface covered by Protected Areas (designated under both national and European legislation) is higher in GEOSPECS areas than on the European average – except for SPAs. However, for all GEOSPECS categories, the proportion of nationally-designated areas is higher than the European average. When only the EU27 is considered, the percentage of Protected Area is generally higher.

The likelihood that an area will be protected for nature conservation purposes can rise where geographic specificities overlap (but this is not the case everywhere). For instance, mountainous parts of Outermost Regions have an even higher propensity to be protected than Outermost Regions overall.

Summary and conclusions

Overall, the GEOSPECS case studies show that many GEOSPECS areas are associated with a diverse flora and fauna. Accordingly, many (but not all) of the areas investigated by the project feature a number of protected areas.

How can this particular characteristic of GEOSPECS areas be valued? To some extent, the approach of ecosystem services is useful, and the

particular ecosystems in mountains and coastal areas (and also other GEOSPECS areas) provide specific services that are vital for the entire European population. However, most of these services do not generate an immediate revenue for the concerned areas.

In addition, tourism can generate income in an area. As many GEOSPECS categories show characteristics that are perceived as "attractive" (particularly mountainous landscapes, coasts, and islands), many are already well-placed to attract visitors. When unique vegetation, some flagship species and/or national park designation is added, the overall image of a particular area can be enhanced to profit even better from tourism opportunities.

Conflicts between natural habitats and anthropogenic demands for land use occur most frequently in areas with high population density. This is true for all of Europe, not only for GEOSPECS areas.

6.2.6 Natural Resource Exploitation

Introduction to the transversal theme

Natural resources can be biotic or abiotic and refer to products derived from biological, ecological or geological processes to satisfy human needs. They also include ecosystem services, which are not directly consumed, but essential for economic production and/or the maintenance of life (e.g. flood attenuation or maintenance of biodiversity) (Bridge, 2009). Natural resources are often characterised by being either non renewable, referring to finite resources, where their removal reduces the supply available for future use or renewable resources, which have a capacity for regeneration. Non renewable resources can be further sub divided into those extracted from the environment (e.g. fossil fuel) or those that once extracted may be recycled (e.g. products of metals). Renewable resources can be classified into exhaustible resources (e.g. fish stock) or non exhaustible resources, where the use of the resources has no impact on amount or quality of this resource (e.g. solar, wind and wave) (Bridge, 2009).

According to Jacques Lévy (2003), the use of the term "productivist" explains why some consider the solution to abandon the most productive forms of exploitation of natural resources. In order to move away from "predatory" types of exploitation, he argues that one on the contrary needs to increase the overall productivity of human action. This is supposed to be the only viable strategy to reduce the waste, so that one can satisfy the needs without impacting nature in an unsustainable way. Jacques Lévy's argument however presupposes that the development of production is driven by needs, while one could also argue that market mechanisms lead to increases in production and consumption, and that the notion of "needs" to be "satisfied" is only of relative analytical value.

Concerns in terms of natural resource utilisation and management and related policy requirement can be broadly categorised according to exploitation, conservation, sustainability and adaptive management. However issues linked to these categories are not mutual exclusive but in many cases have to be dealt with simultaneously (Bridge, 2009). Many of the natural resources our society depends on to keep our economy operational are overexploited, limited in supply and some are non-renewable (EUROPEAN UNION, 2011). The European society by and large has been affluent for many decades, benefitting from the intensive use of natural resources but is now faced with a dual challenge of addressing overexploitation and limited supply of natural resources on the one hand, while trying to stimulate economic growth and prosperity on the other

(EUROPEAN COMMISSION (2011b)). To tackle issues such as the limited supply and subsequent rising prices of natural resources in Europe, the Europe 2020 strategy, which aims to deliver smart, sustainable and inclusive growth, has focused on a resource efficient Europe as one of its seven flagship initiatives (EUROPEAN COMMISSION, 2011c).

Furthermore, EU regions enjoy some of the highest standards of living in the world, yet at the same time the continent is one of the poorest as far as conventional energy reserves are concerned (ARMAROLI & BALZANI, 2007). It is estimated that more than a third of generation capacity of some EU Member States could be lost by 2020 if alternatives to fossil fuels are not utilised (EUROPEAN COMMISSION, 2010c). Given the scarcity of conventional energy resources, energy conservation is mandatory for Europe (ARMAROLI & BALZANI, 2007). The flagship initiative focuses strongly on exploitation of non-fossil fuel and renewable energy, which should greatly reduce the EU's dependence on limited fossil fuels in future and enhance resilience of the EU's economy towards future increases in global energy prices (EUROPEAN COMMISSION, 2011c; b).

Against this backdrop, GEOSPECS asks:

- Are GEOSPECS areas endowed with any particular resources?
- Is the socio-economic context for natural resource exploitation different in GEOSPECS areas compared to other areas?
- As far as renewable energies are concerned: are the preconditions for renewable energy generation particularly good (or particularly bad) in any of the GEOSPECS categories, and if so why?

Some natural resources are causally linked to different forms of geographic specificities:

- Mountain areas play an important role in supplying the European continent with water, e.g. contributing to regulate rates of flow throughout the year. Water management policies in mountain areas are therefore as important for lowland areas as for the mountain areas themselves. Energy generation from hydropower installations is concentrated in mountain areas and historically been important in the development of manufacturing activities, chemistry and high technology in mountain areas. At the same time good timber resources can often be found in mountain areas, but may often be underexploited in areas where steep slopes make mechanisation difficult.

- Most islands have access to wind, wave and tidal resources for the generation of renewable energies. However, limited accessibility can make the exploitation of certain natural resources unprofitable.
- Sparsely Populated Areas (SPA) have a range of unexploited natural resources of global importance such as minerals and forests. An often encountered challenge is to create a social and economic context making it possible to attract qualified workers that would contribute to their exploitation.
- Coasts host the “landing points” through which the output from the exploitation of marine resources is brought to manufacturing industries and to final consumers. These marine resources range from fossil fuels to fish, from renewable energies (offshore wind, wave energy) to marine aggregates. The extent to which the transit of these resources through coastal “landing points” actually benefits coastal communities is an open question. One can for example presume that small scale coastal fisheries have a different regional impact than fleets of industrial trawlers; however, only limited concrete empirical evidence has been compiled in this respect. The combined effects of changing technical and commercial framework conditions for fisheries and of variations in fish stocks have been dramatic in a number of coastal areas.

Coasts areas also host some specifically coastal forms of resource exploitation, e.g. aquaculture and wind farms. These also pose specific challenges, e.g. in environmental terms, but do improve the perspectives of socially and economically sustainable development for many coastal communities.

- Border areas are not intrinsically linked to any form of natural resource exploitation. However, the exploitation of cross-border resources requires sound cross border management. Existing challenges include the lack of cooperation, different languages and limited access due to lack of infrastructure.
- Outermost regions (OR) face major challenges in terms of access. The Spanish and Portuguese ORs face isolation as remote island territories. The French ORs are territories with European type of regulatory frameworks, with neighbouring countries with different legislations, labour costs and standards of living.

Issues related to natural resource exploitation identified in GEOSPECS areas

Resource exploitation in GEOSPECS areas can be approached:

- from a European and national perspective, identifying critically important inputs to general economic development;
- from the perspective of individual GEOSPECS areas, seeking to identify how natural resources exploitation can contribute to their own ambition of achieving balanced and sustainable development.

The potential adverse long term effects of discoveries of large natural resources on national and regional economies are well known. The term "Dutch disease" was coined by journalists of *The Economist* observing how the exploitation of the Groningen Gas Field had a negative impact on growth and productivity in the manufacturing sector while at the same time generating inflationary pressures (Ebrahim-zadeh, 2003). This does not imply that natural resources need to have a negative economic and social impact. However, careful planning is needed to avoid bringing the revenues generated by this activity into regional and national economies too quickly. As it may be politically difficult to resist the temptation of spending available incomes on improved public services and higher wages, a solid institutional framework is needed to ensure that natural resources actual become economically beneficial on the long term for local and regional economies. The lack of such solid institutions in many parts of the world, and especially in developing countries, is one of the reasons which scholars refer to the notion of "resource curse" (Mehlum, Moene & Torvik, 2006).

The institutional contexts of the GEOSPECS areas analysed in the present report are quite different from those of developing countries. However, these territories tend to be more isolated, more peripheral and have a more limited institutional capacity than "mainstream regions". Another factor that may contribute to limit the socio-economic benefits of natural resource exploitation is the limited size of local labour markets. On the one hand, it may be difficult to recruit workers with the required professional profile locally. On the other, natural resource exploitation endeavours in small, local communities to extract natural resources may create an imbalance on the labour market by attracting a large proportion of skilled workers from pre-existing companies and from providers of public services. Another solution is to recruit external workers that work on the exploitation of the natural resource for limited periods of time. The so-called "fly-in fly-out" model disconnects a large part of the economic benefits of the natural resource exploitation from the region in which it occurs (Storey, 2001).

Within the GEOSPECS areas there are some case studies where the exploitation of natural resources has been to the benefit of regional and national economic growth and security of energy supply e.g. wind in the coastal region of the Irish Sea, minerals in the Sparsely Populated Area (SPA) and cross-border region of the Torne Valley (see Figure 66) and hydro and bio-energy in the mountain regions of the Scottish Highlands and the Jura Massif.

In many others cases e.g. the island regions of Sicily and the Outer Hebrides, and the SPA of Central Spain, the optimisation of exploiting natural resources, while forming an integral part of regional and national strategies, remains to some extent an aspiration and requires extra support to utilise the resources to their full potential. Constrains that may have to be addressed in these areas are not linked to a physical limit of the resource but an economical constrain connected to for example access from within the specificity, lack of labour force and price. Policy support may improve capacity in the areas of technological innovation, behaviour change and collective action as well as increase access to decision making process (Bridge, 2009) to incorporate local needs as well as knowledge.

Particular Resources

A better understanding of the geography and history of specific resources is the first step in order to develop existing underutilised and emerging opportunities in natural resource exploitation. Particular to coastal areas is the possibility of extracting marine aggregates. This type of resource exploitation is growing in the waters of the Belgium coast (VAN DEN EYNDE & NORRO, 2009; LANCKER et al., 2007), where the aggregates are utilised in the construction industry and as materials for land reclamation and the re-nourishment of eroding beaches (VAN LANCKER et al., 2007).

Opportunities in terms of exploiting this resource in the Irish Sea have been identified in the Irish Sea Marine Aggregates Initiative (IMAGIN), a collaborative project between Ireland and Wales, which focused on the sustainable management of marine aggregate resources while posing the minimum risk of impact on marine and coastal environments (SUTTON et al., 2008). However the actual exploitation of the resource is relatively low in the current economic climate as the biggest potential user of the resource, the construction industry is in decline. On the other hand other avenues should be explored as these aggregates provide excellent beach nourishment and coastal defence material. This is especially important in the context of climate change induced sea level rise and a critical demand for aggregates may arise for the coastal areas around the Irish Sea.

In both coastal case study areas and for the islands of the Outer Hebrides fish are cited as an important natural resources, however fishermen are faced with several challenges such as resource depletion due to overfishing, restrictive quota regulations and the effects of climate change (ROBERTS et al., 2003). In the coastal case study areas expansion of the aquaculture sector is noted as an opportunity to partly compensate for the declining fishing industry.

Both case studies on sparsely populated areas show that these areas offer important natural resources. The Fennoscandian Shield (of which Torne Valley is part) is one of the most potential areas for new mining now and in the future (Damsgaard et al. 2009). At the moment almost 90 % of the European need of iron ore comes from Northern Sweden. Northern Sweden and Finland contribute also to significant parts of the EU's production of gold, silver, zinc and copper. Furthermore, chrome production in Kemi in northern Finland has great significance for the production of stainless steel. In the Torne Valley, a SPA and cross-border region (see Figure 66), which is located between Finland and Sweden, existing mining projects are expanding and new projects are underway. Challenges that have to be resolved in order to maximise the local and regional economic and social benefits are the lack of existing infrastructure, limited cross border labour force and environmental impacts.

In Teruel and Soria, SPAs in Central Spain, the extraction of ornamental rocks such as alabaster and of construction materials such as clay is under-utilised despite a local abundance of the resource (BAULUZ & SUBIAS, 2007). However, it is the exploitation of coal that has had the largest economic and physical effect on the region. Around 65% of the total coal production in Spain originates in Teruel and its exploitation is integral to the national energy supply of Spain as well as Teruel being an important contributor to the local and regional economies (see Figure 67).

Forests are another important resource, particularly in the sparsely populated areas. There are vast forest resources in northern Europe. Sweden and Finland together account for 34% of the EU27 countries' forest land and 33% of the forest available for wood supply. The cultivation and harvesting of forests have provided a significant contribution to the regional economy in the Torne Valley (see Figure 66), providing many jobs for past and current generations. The region contains some of the vastest coverings of woodland in Europe, though much of the commercial potential of logging is limited by unfavourable climatic conditions.

In the Jura Mountains, forests comprise much of the landscape – an estimated 48% of the region is forested (OFEV, 2010). The forest landscape is viewed not only as economically important, but also in a cultural sense as it is immediately associated with the Jura region and therefore important for regional tourism. Timber from the Jura is maybe less of an opportunity in quantitative terms than in qualitative terms. The cool and humid climate, good geological characteristics but only moderate altitudes of the Jura massif lead to solid and homogenous timber. An initiative even tries to attain an AOC label for coniferous wood from the Jura – it claims that this wood deserves a quality label due to its extraordinary robustness.

Renewable Energy Resources

Evidence from the case studies suggests that in many GEOSPECS areas renewable energy resources are seen as opportunities for future development. The Outer Hebrides is perhaps the best example, where wind, although identified as an opportunity to be exploited, is under-utilised as a resource. The islands – because of their location at the North-Western fringe of Europe - are surrounded by some of the most consistent and powerful winds in Europe, but energy production from wind and other renewable sources remain disproportionately low. In 2009 electricity generated from renewable sources in the Outer Hebrides is estimated at less than 6 MW. The proposed future generation is around 300 MW. It is widely believed that onshore wind has the greatest capacity to maximise economic and community benefit in the Outer Hebrides. On top of that, the potential for marine energy exploitation is significant in the Outer Hebrides. As the prevailing wind direction in Europe and the area of greatest fetch are westerly, west-facing sites generally have the greatest wave energy resource. The most attractive sites are where deep water can be found close to the shore, as seabed friction progressively removes energy from ocean waves (Scottish Executive, 2007). The best potential exists around the Scottish islands. In Europe, Scotland is among the top locations for marine energy, with around 25% of Europe's tidal stream resource and 10% of its wave resource (Forum for Renewable Energy Development in Scotland, 2009). This high potential is obviously mainly due to the area's geographical *location*, but it is only from the coast that marine renewable energies can be exploited, and thus this potential is linked to the coast. Recording the most suitable locations on maps is the first step in order to progress on such potential, which will need to be furthered through Marine Spatial Planning and Integrated Coastal Zone Management to be sustainable and avoid future conflict with other existing and potential uses of the area.

Islands such as the Outer Hebrides and Sicily experience high energy prices because of high cost of transporting electricity from generation sources to the islands. Insularity in that context may provide an extra incentive to develop endogenous electricity generation from the abundant local wind and marine resources (i.e. wave and tide).

In recent years there has been a large increase in the developments of onshore and offshore wind farms in both the Belgian coast and the Irish Sea coasts (TOLON-BECERRA et al., 2011; SEAI, 2010). In the eastern Irish Sea alone, it is estimated that by 2020 wind farms will occupy an area of 254km². The coast of Belgium (see Figure 65) has one of the most conducive environments for wind energy production in that some of the highest wind speeds in Europe exist in the Belgian part of the North Sea. It has been shown that significant obstacles in developing the industry is the reluctance of the public to accept new wind turbines on land, which makes the offshore environment a more attractive location for future wind turbine development (VAN ROMPAEY et al., 2011.) (see Figure 65). A similar situation exists in mountain regions. The wind resource in the Highlands of Scotland is considered one of the best in the world, yet due to the proximity of potential sites to protected areas and residential zones, the resource is largely under-developed (HIGHLAND COUNCIL, 2006). Hydropower is predominately used for renewable energy in the Highlands, while other renewable resources are explored for future development or are utilised but not to the same extent as hydropower e.g. biomass, wave and tidal energy.

Wind resources have been highlighted as being under-utilised in the sparsely populated regions of Central Spain as a result of the regional topography in combination with a lack of adequate infrastructure.

Another renewable energy source, the sun, is viewed as being a potential great resource to the Central Spanish province of Teruel. At present, eight 50 MW solar plants are planned for the wider region, with four planned for the province of Teruel. The region's potential in forestry areas including herbaceous and woody crops has led to serious investigation into biomass production to generate energy as a future opportunity (GOBIERNO DE ESPANA, 2005). Regional forestry cooperatives and energy agencies are collaborating with regional authorities investigating the benefits of such undertaking to rural communities and regional development in terms of employment and landscape management.

In the SPA and cross-border area of the Torne Valley hydropower accounts for almost all electricity generation in the region. Opportunities to develop renewable energy from other sources have been identified for wind and bio-energy. Current wind energy production continues to be very

low, while bio-energy is the existing primary form of renewable energy because it is used for heating in Finland, Norway and Sweden (LINDBLOM & RASMUSSEN, 2008).

Outermost Regions are obviously not connected to the European energy grid and thus have to rely on themselves (or neighbouring countries, if possible) for their energy provision. In French Guiana 60% of the electricity comes from hydro-electric plants (115 MW) and there is still a potential to produce more by hydro-electric generation. In addition, solar energy (photovoltaic) is likely to address the need of the population in the isolated areas, but it is still insufficiently developed (projects are ongoing). A third promising source is biomass energy from the exploitation of forests. French Guiana produces about 2 MW per year from biomass derived from sawmill waste. Although French Guiana has extensive fuel wood resources, their value is not being fully realised at present.

Access to resources

Resource access can be viewed from several spatial scales taking into account for example access and control on a local, national or EU level. Furthermore issues are often related to resource security and geopolitical power. Two main issues emerge from the geographic specificities examined where natural resources are considered less accessible because of their distance to the main European markets while other natural resources are difficult to access within the specificity. As shown, many important resources are located in relatively remote or inaccessible areas (sparsely populated areas, islands), which may hinder their efficient exploitation. In the Torne Valley a reason for the under-utilisation of mining resources is a lack of infrastructure capacity (i.e. road, rail). Additionally, access via ports is frequently hampered by frozen seas. In a similar way, renewable energy resources in the Highlands and Islands (including the Outer Hebrides) have been said to be underexploited because of a lack of grid capacity – this in turn being due to the remoteness and low population density of the area, where the construction of large-scale power cables has so far not been profitable and would in future be a major investment.

Conversely, the lack of a particular resource may also be an issue in geographically specific areas and relates to resource security. In Sicily access to fresh water is a major issue. Water scarcity is a persistent problem in the island due to the very low (on average 400 mm of rain per year) and the lack of underground aquifer capacity. Water shortages have profound effects on the agriculture sector especially livestock farming on

the island but affect any new business development as water is one of the natural resources we depend on for survival and many daily operations.

Lastly, it must be kept in mind that – while constituting an opportunity - large-scale exploitation of resources is not always greeted with joy by the local population. This is certainly not only true for areas with geographic specificities, but *also* for them. As mentioned, mining is an important activity in both SPA case study areas. This entails significant environmental impacts. At the same time, it may effect on tourism, as visitors expect unspoiled nature, and it can conflict with other natural resource exploitation such as the forestry industry. In the Torne valley, another interest that must be balanced against the interest of mining operators is that of the Sami people, who have particular rights of way and land. Similar issues have been identified in the TeDI project, where for example in the Romanian county of Alba the interest of the Rose Mountana Gold mining company conflicted starkly with concerns of some locals and NGOs. On the one hand the gold mining company promised to reinvigorate the local economy, while on the other the NGOs challenged this claim and warned that jobs and opportunities will be lost as environmental and historical assets suffer from the gold mining operation and subsequent impacts (Gløersen et.al., 2010)

In coastal regions, environmental impacts can pose a challenge in accessing marine renewable energy resources such as tidal, wave and wind energy. Noise pollution as a result of drilling, dredging and pile-driving during the construction has had noticeable effects on bird and marine mammal populations. Offshore wind turbines also impact on benthic animal communities and migrating bird species (WILSON et al., 2010). However, much of the impacts are now carefully assessed and monitored through Environmental Impact Assessments.

Quantitative evidence

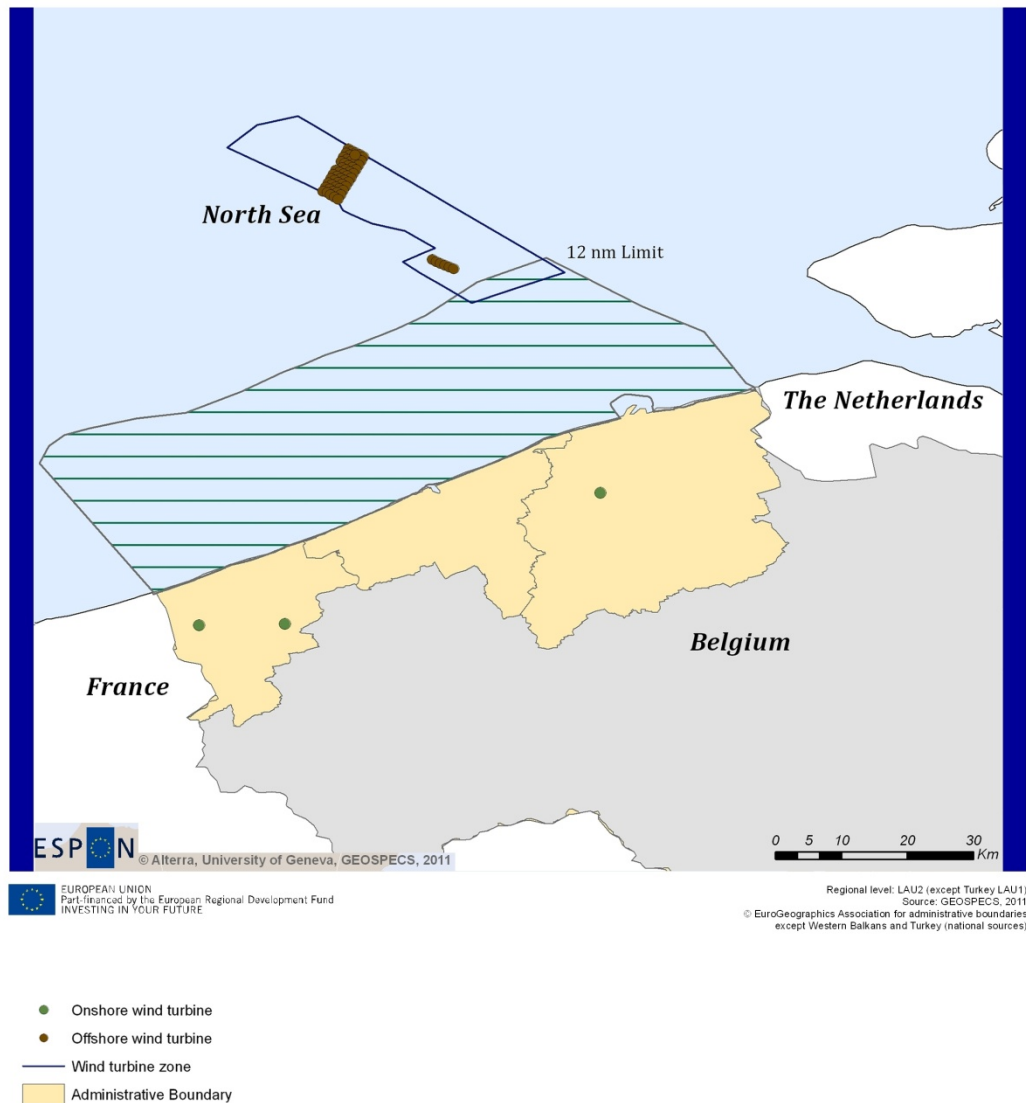


Figure 65 Onshore and offshore wind energy project on the Belgium Coast.

These projects demonstrate the increasing development of offshore projects compared to onshore more localised occurrence

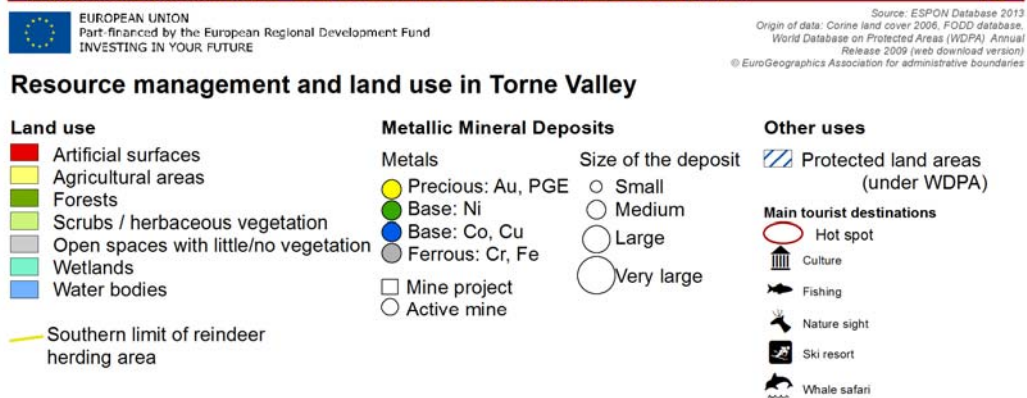
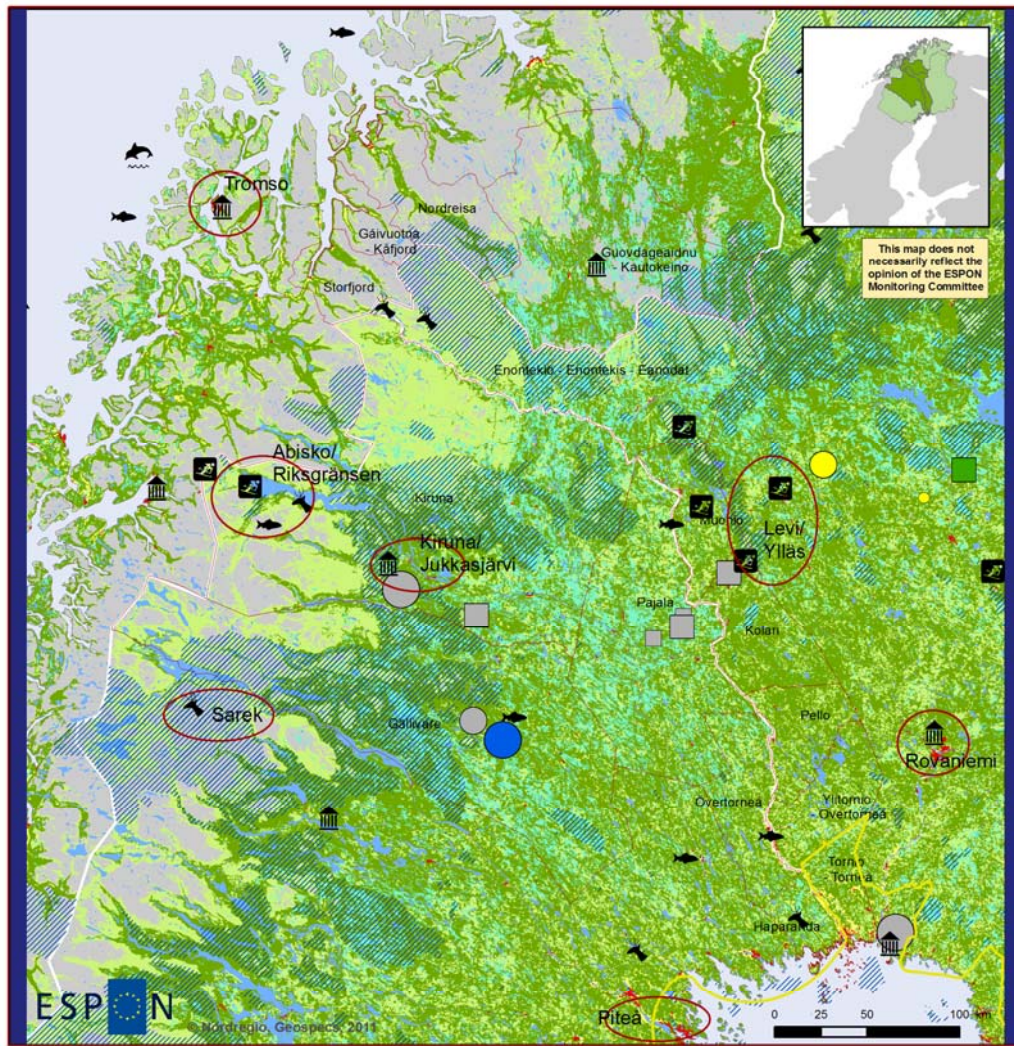
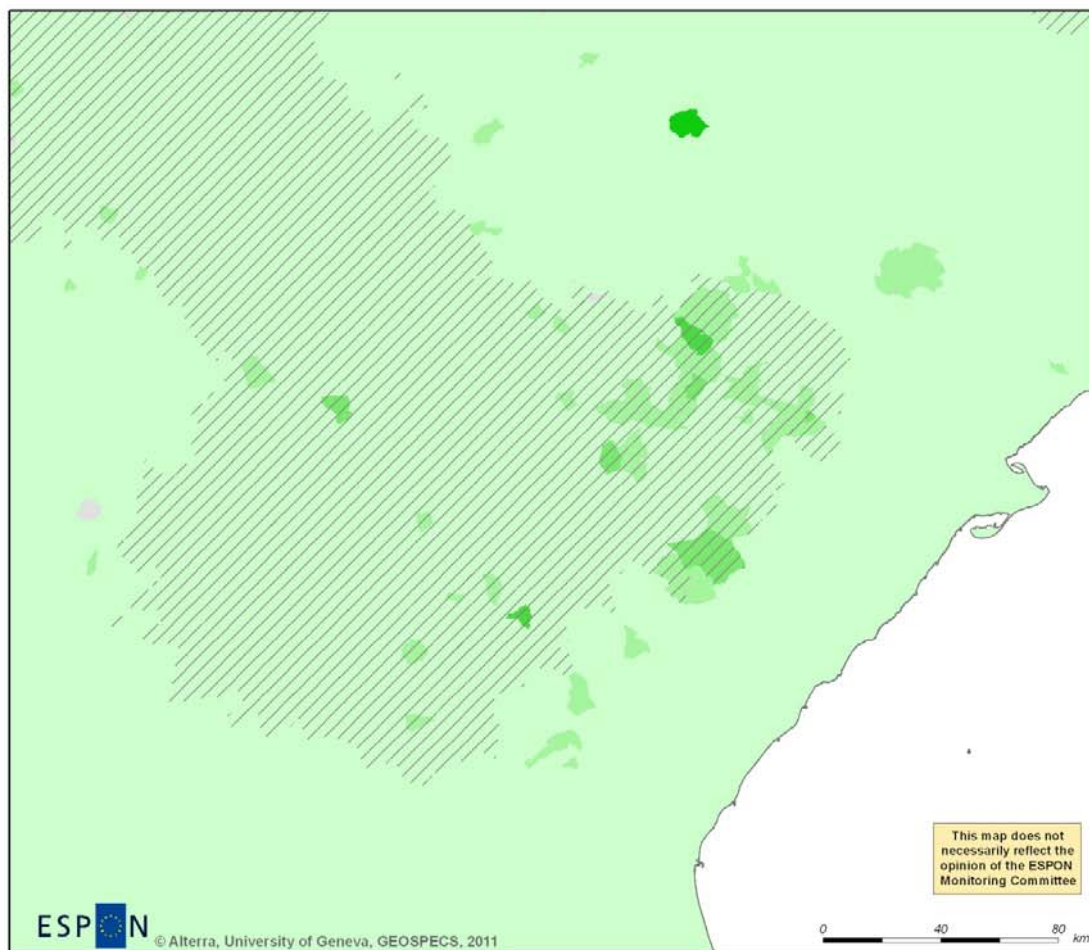


Figure 66 Natural Resource management in SPA and cross- border region of Torne Valley

Mining in Spanish Sparsely Populated Areas

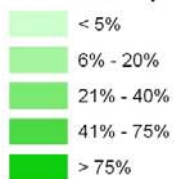


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Regional level: LAU2 (except Turkey LAU1)
Source: GEOSPECS, 2011
© EuroGeographics Association for administrative boundaries
except Western Balkans and Turkey (national sources)

Mining Employment

% of total employment



////// GEOSPECS Sparsely Populated Area

Figure 67 Hotspots of employment in the mining industry in an SPA of Central Spain

4 Summary and conclusions

Considerable transformation related to scale, rate and type of natural resource exploitation have taken place in recent history and while EU policy is addressing some emerging issues it is important to identify particular resources and social, economic and political issues related to the specific resource as well as specific place to optimise resource exploitation in a sustainable manner. The case studies highlight, that it is essential to gather certain information on a case by case basis in order to identify resources and issues that are particular to a local area, which may not apply to other areas of that same specificity.

The most important natural resources can be found in the sparsely populated areas. There is evidently no direct link to the geographic specificity (the resources are not there *because* the area is sparsely populated). However the limited population of these areas has limited the exploitation of these resources but require knowledge on how to use them, which could be supported by policy that facilitates such development.

As for renewable energies: The case studies confirm the hypothesis that some of the geographic specificities are linked to a particularly high potential for the generation of renewable energies. Hydropower in mountains, and wave, tidal and offshore wind energy along coasts are the best examples (the latter of course extends to islands). In addition, Outermost Regions are well-placed to generate solar energy (due to their position closer to the equator than the European mainland). In sparsely populated areas, there might not *per se* be a potential for a particular renewable energy source, but the long stretches of uninhabited land make the installation of large-scale wind parks easier than in densely populated areas, where inhabitants often raise protests against these installations. Besides, biomass is often an opportunity in SPAs, simply because wood (and other sources of biomass) have more space to grow undisturbed from human activity. For instance, biomass represents the main renewable resource for heating in Finland, Norway and Sweden.

The presence of an abundant natural resource does not necessarily translate into successful exploitation of that resource. In this sense the geographical specificity of the region may be counter-productive to the capitalisation of resources, i.e. geographic distance, cost to population ratio or limited available workforce. In many instances the resource is available, yet it is difficult and expensive to harvest the resource effectively (e.g. wind, sun), while in other cases the resource is inaccessible due to infrastructural or environmental barriers. Resource

availability is also mediated by wealth and power. Inventorying resource availability is essential but the next step is to examine the social mechanism that facilitates or hinders the ability to benefit from a resource on a national, local as well as individual level.

Optimising natural resources on offer in geographic specificities in the context of Europe 2020 strategy and its flagship initiative "resource efficient Europe" requires understanding of the resources and challenges. However these have to be seen in the context of geographic specificities as well; as those that maybe local and particular to just one area. Therefore initiatives and policy support require not only European level input but regional and local considerations. Exploiting existing resource can be detrimental to an area as the operations and environmental impacts of such undertakings may be in conflict with other local interest and activities. Policies promoting any exploitation of a natural resource have to consider social and ecological impacts and GEOSPECS areas are especially fragile in terms of such changes. Local stakeholder involvement is not only beneficial but essential in the policy making process as the extensive local knowledge base on the natural resource, the geography and the social workings of the specificity have to be incorporated and such involvement also provides access of the stakeholders to the decision making process furthering support of the local community to future changes.

6.2.9. Vulnerability of human-environment systems to climate change

Findings from the case studies generally confirm that climate change impacts and vulnerabilities are distributed unevenly across the regions of Europe. Roughly speaking, regions that are less advantaged in terms of economic development and growth potentials and facing serious development constraints already today appear to be more vulnerable in the future in comparison to the European average. The case study regions appear to blend in the larger picture of a prevailing core-periphery pattern and of a North-South and West-East gradient in vulnerability levels, as it has been ascertained in previous assessments (e.g., ESPON & IRPUD, 2011; EEA 2010f; EEA/JRC/WHO, 2008; DG REGIO, 2009; Alcamo et al., 2007). That large-scale distribution of vulnerability is to a considerable extent caused by factors that are not directly related to geographical specificities.

These factors include: different strength and, sometimes, different direction of climate change signals due to different exposure, which depends mostly on geographic position within Europe; a traditionally higher importance of climate-sensitive sectors, in particular the primary production sector (agriculture), in the Mediterranean and Eastern and South-Eastern Europe, which is influenced by the predominating economic structure and the current transition state of the respective national economies; and by large-scale

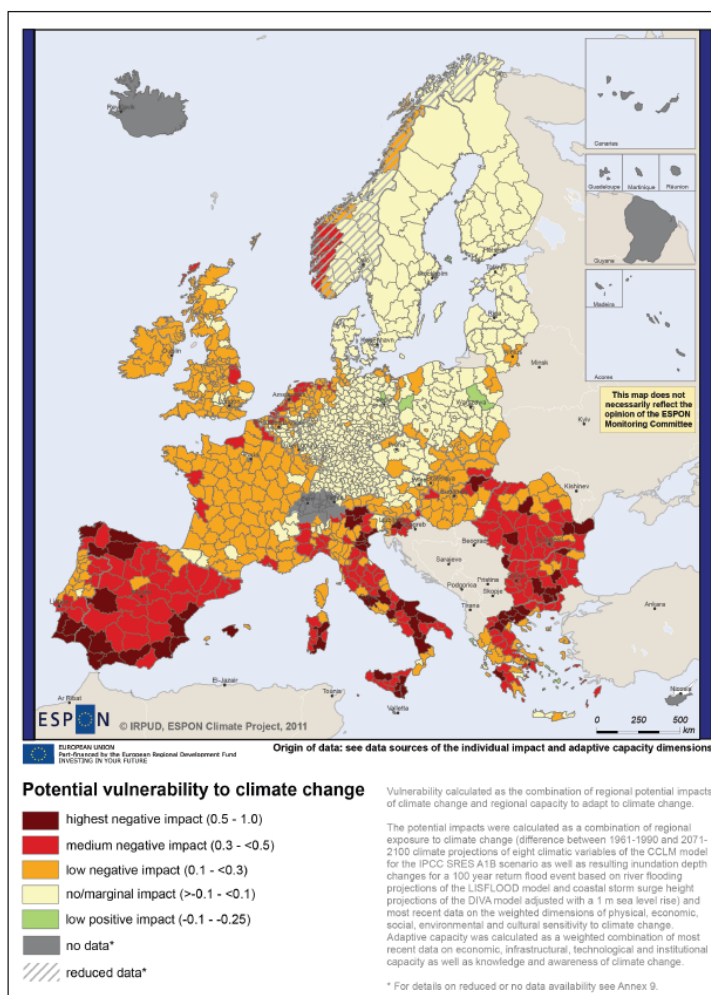


Figure 68 Overall potential vulnerability to climate change according to the ESPON CLIMATE project (ESPON & IRPUD, 2011)

differences in adaptive capacity, which are to a large extent related also to the general development status of national economies, causing a North-South gradient similar to that of overall vulnerability. In many respects, the large-scale differences in these factors across Europe appear to act as a generic pattern driving differences in vulnerability across different categories of territories, causing different climate change sensitivities, impacts and vulnerabilities also across and within areas with geographic specificities. There is thus a considerable diversity of impacts and vulnerabilities also within the same GEOSPECS categories.

However, there also appear to be strong interrelations between the constituting geographic specificities of a number of GEOSPECS areas and their vulnerability to climate change. In particular, there are climate change impacts and vulnerabilities that are either rather specific to certain areas with geographic specificities or are more relevant to them than to other types of regions:

Coastal areas, including the coastal zones of islands and outermost regions, are particularly sensitive to effects caused by gradual sea level rise and by extreme sea events, such as coastal storm surges, coastal erosion, and local salinization of coastal aquifers, as well as to inundations of coastal zones caused by river floods. Combined with high concentrations of populations, infrastructure, economic activities and material assets in many parts of the European coastline, in particular along the British, German, French, Dutch, Belgian, North Italian and Norwegian coasts, this accounts for a high vulnerability of coastal areas, despite an often rather high adaptive capacity. In general, sea level rise adjusted extreme events will impact on all economic sectors and activities within coastal areas. Occurrence of damage events is expected to significantly impact on the entire economies of coastal regions, including knock-on social effects. Beach erosion and salinization of estuaries are expected to cause progressing loss of coastal habitats and their biodiversity. These impacts are a consequence of physical exposure to climate-driven hazards that are specifically linked to coastal areas and do not occur in any other geographical type of region. In addition, often high densities of population and physical structures make many coastal areas also vulnerable to a range of other climate change impacts, e.g. related to seasonal water scarcity and urban heat stress. As the case studies demonstrate, the impacts of climate change are often likely to exacerbate other existing stresses that are characteristic to coastal zone with intense human utilisation, such as land pressure, environmental pollution, and dependency of water supply on transfer from other regions, causing multiple-stress vulnerability situations. Although not all coastal areas within Europe are equally vulnerable, the factor constellation described above makes many coastal areas vulnerability hot spots within Europe.

The case study of the Belgian coast is a good example of an area at risk, with dense population and significant infrastructure in close proximity to the coastline.

Mountain areas are particularly vulnerable to specific impacts of climate change. Mountain areas have stronger exposure to climatic changes because temperature increase has been observed to be stronger in higher elevations. Meeting upon specific mountainous terrain features, many projected changes in climatic stimuli, including more winter precipitation in Northern and Central Europe, earlier beginning of snow melt, more frequent extreme weather events, permafrost thawing, and glacier ablation, will contribute to increase significantly natural hazard potentials. Besides higher flood risk in mountain valleys, settlements, infrastructure and populations in mountain areas will become increasingly vulnerable to mass movements triggered by climate change, such as debris flows, landslides, torrential processes, and rockfall. Expanding hazard zones are expected to restrict future spatial and economic development options. Against the background of a constantly increasing damage potential due to on-going land development for settlement and business purposes, an increasing frequency of hazard events is expected to cause a growth in damage costs and economic losses on an annual basis. Damage events could also negatively affect perceptions of safety and accessibility, thus reducing residential attractiveness and attractiveness for investors. While not being restricted to mountain areas as defined in the GEOSPECS project, these gravitational hazard processes are much more relevant in mountain areas than elsewhere. Obviously, a range of consequences related to glacier ablation and permafrost thawing, which include alteration of hydrological and run-off regimes in glacier-fed catchment areas, detrimental effects on hydropower generation, and increasing risk to settlements and infrastructure from destabilisation of mountain slopes due to permafrost degradation, are exclusively linked to high-elevation mountain areas.

The economy of many mountain areas, especially of the Alps, is strongly reliant on winter tourism. Decreasing snow reliability causes high vulnerability of the winter tourism sector, and in many locations its economic viability is severely threatened even in the short to medium term. As is demonstrated by some of the cases studies (e.g. the Tatra mountains and the West Stara Planina), this could cause the loss of development ambitions related to investments planned in the winter tourism industry.

Due to lack of other land use possibilities in rough mountainous terrain, forests tend to be the dominating land cover, and forestry an important economic sector, in many European mountain areas. This makes the entire forest-wood production chain in mountain areas particularly vulnerable to adverse climate change impacts on ecological stability of

forest ecosystems and on forest productivity, which are projected to occur throughout Central, Eastern and South Europe. Via impairment of the protective function of forests, destabilisation of forest ecosystems could have reinforcing feedback effects with natural hazard potentials.

Due to a higher natural hydropower production potential, hydropower generation is, in principle, more important in mountain areas than in other types of territories. Decreasing summer precipitation, more frequent and more extreme low water levels during summer and more frequent high run-off volumes after heavy precipitation events are projected to significantly decrease the hydropower production potential in European mountain regions, except in North Europe. Combined with increased sedimentation in high-alpine hydropower reservoirs and higher risks to energy supply infrastructure from natural hazards, this threatens continuity and reliability of energy supply in some mountain regions, in particular during summer, when energy demand for cooling purposes is expected to increase.

Mountains are among the regions richest in biodiversity in Europe. Due to a lack of re-dispersion opportunities, biodiversity in mountains is at the same time more vulnerable to climate change than in most other types of regions. Species communities in the highest elevation zones are most vulnerable.

In consequence of the range of mountain-specific impacts and their potential consequences on territorial development, it can be concluded that mountain areas in fact represent vulnerability hotspots within Europe.

A common characteristic of sparsely populated areas is the strong dependency of their economies on the primary sector and on the economic use of natural resources. Since agriculture and forestry are highly climate-sensitive sectors, as are the ecosystem services they capitalize on, this makes the economies of sparsely populated areas highly sensitive to climate change. However, it must be noted that this overall higher sensitivity does not automatically translate into higher economic vulnerability, because due to large-scale differences in exposure to climate change the agriculture and forestry sectors in Northern Europe could potentially benefit from climate change, while in the Mediterranean and in South-East Europe impacts will be strongly negative.

Almost all GEOSPECS areas have higher levels of biodiversity and, correspondingly, a higher share of protected areas than in the European average (cf. the transversal theme "biodiversity" in this report). Since it is assumed that any climatic change alters habitat conditions and affects their biotic communities (although they are not equally sensitive to climate change), it follows that biodiversity as such is highly vulnerable to climate change, and that the biodiversity within GEOSPECS areas is more vulnerable than in other areas. At the same time, also the conservation

objectives of the respective protected areas are at threat. In addition, a general lack of effective adaptation options available to mitigate the effects of climate change on species communities and ecosystems further increases their vulnerability.

Evidence provided by the case studies support the judgment that in sparsely populated areas, including the sparsely populated parts of mountains, islands, and outermost areas, the transport infrastructure and their functions for providing access to services of general interest are particularly vulnerable to damages and disruptions triggered by extreme weather events. While the usually sparse transport network in sparsely populated areas may not represent high material values in itself, what matters here is their vital importance as “life-links” for the rural population, i.e. for delivering essential goods and services to populations in scattered settlements, as well as their logistical function in regional economies that are often highly dependent on continuous export of natural resources. The greater the lack of redundancy in the transport infrastructure network, the potentially stronger the effects of service interruptions and loss of access are for the population affected. More frequent disruptions of accessibility hold the potential to decrease residential attractiveness, resulting in acceleration of existing depopulation trends. Climate-induced damages to the transport network can also have severe knock-on effects on businesses and regional economies, impacting also on perceptions of accessibility, reliability and safety of transport connectivity on the part of business investors, and thus on their willingness to invest in areas that are perceived as inaccessible. In disaster situations, even temporary loss of access to health, emergency, and disaster relief services can pose serious problems to remote settlements. Increasing maintenance and repair costs for damaged infrastructure can put an additional financial burden on economies that already have to face higher transport costs and higher costs for supplying services of general interest.

The increase in vulnerability of the transport infrastructure and the socio-economic functions it fulfils within sparsely populated areas illustrates that in many cases existing development constraints that are characteristic of GEOSPECS areas are exacerbated by climate change. Moreover, it emerges from the case studies that different kinds of climate change impacts can cause similar consequences in terms of reinforcing existing development challenges within and across GEOSPECS areas. For instance, on the one hand an increase in winter precipitation and heavy rainfall events is likely to increase the risk of damage to transport connections in the Scandinavian sparsely populated areas, reinforcing existing problems related to poor accessibility, high transport costs, and lower residential attractiveness. On the other hand, the sparsely populated areas in the Mediterranean and the island areas of the Canaries and Sicily will be

affected by severe drying trends and increasing water scarcity, causing bottlenecks in water supply to households and raising the need for desalination, which is likely to result in higher water prices, higher energy demand from external sources, and higher production costs for businesses. Though the climate-triggered causes are different between abovementioned types of territories, the effects may be comparable in so far as they tend to exacerbate existing socio-economic development constraints that are closely associated to their constituting geographic specificities.

Findings emerging from the case studies also demonstrate that climate change vulnerabilities may sometimes contest existing development ambitions. This is obvious for planned investments in the development of winter tourism infrastructure and regarding hydropower development schemes in mountain regions, whose feasibility and sustainability is threatened in the face of climate change. Also in rural areas prone to decreasing water availability, realisation of development opportunities related to natural assets such as development of renewable biomass energy sources or of eco-farming appears difficult to achieve against projected climate trends. In such cases, adaptation to climate change may require developing alternative and more sustainable future development paths.

Climate change can, on the other hand, also bring about new development opportunities. This is most evidently illustrated by summer tourism, which could in many European regions benefit from an extended tourist season, with mountain areas and more northerly regions gaining in touristic attractiveness in general, and with more traditional summer destinations in the Mediterranean potentially benefitting from a better balancing of touristic capacity utilisation over the year. However, these opportunities need to be exploited by developing alternative tourism offers, and within Europe there will be regions with a net gain and such with a net loss in overall touristic demand.

The levels of adaptive capacity show some marked commonalities and differences between the GEOSPECS categories. Although there is considerable diversity within the same categories, overall there is evidence that generic adaptive capacities of islands, outermost areas, sparsely populated areas, some mountain areas, and peripheral border regions tend to be lower than on the European average. Comparatively low generic adaptive capacity in these area types appears to reflect existing socio-economic difficulties and development constraints that are specific to these often less advantaged territories, such as isolation, distance to economic and governance centres, smallness of markets, and strong external dependencies in the case of outermost regions and islands. On the contrary, the cross-border metropolitan regions are among the regions of Europe with the highest adaptive capacity, which is closely

related to these areas being high income, knowledge-intensive, innovation-oriented economies. Coastal areas, in particular those densely inhabited, appear to also have high adaptive capacity, but due to strong climate change impacts they are still vulnerable. The examples of islands and sparsely populated areas show that some characteristics that are closely connected to their geographic specificities, such as a strong social capital arising from tight-knit communities, can actually increase some determinants of adaptive capacity. Interestingly, borders can both increase and decrease adaptive capacity, depending on whether the cross-border setting is being utilized as a stimulus for trans-boundary socio-economic development or rather acts as a constraint for cross-border cooperation, which may be due to historical, cultural and language barriers or to the EU external border security regime. A lack of trans-boundary cooperation can be particularly problematic for adaptation to climate change in cross-border regions if vulnerabilities vary largely on both sides of a cross-border corridor (ESPON & IRPUD, 2011).

Generally speaking, it becomes obvious that all policies that have a positive effect on regional economic growth and territorial and social cohesion should be beneficial also to improvement of adaptive capacity. However, since a high adaptive capacity does not automatically translate into effective adaptation to climate change, there is still a need to effectuate adaptive capacity via targeted adaptation strategies.

The full analysis of this transversal theme can be found in Annex 46.

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The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.

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