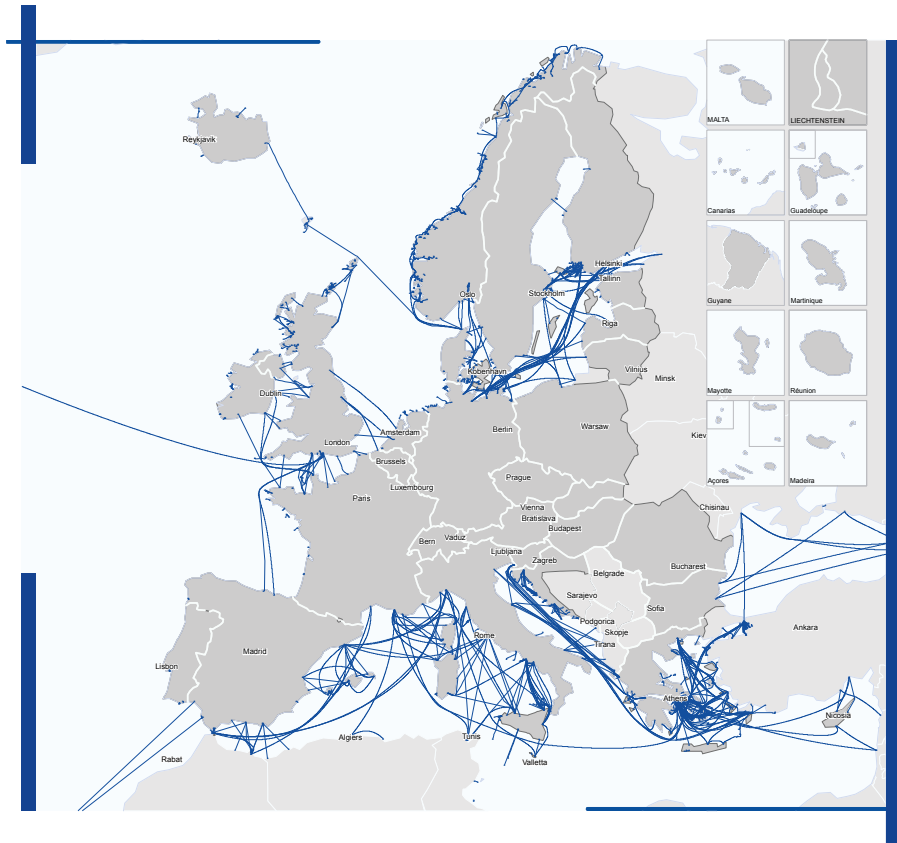


Inspire policy making by territorial evidence

ESPON Working Paper

Revealing territorial potentials and shaping new policies in specific types of territories in Europe

Islands, mountains, sparsely populated
and coastal regions



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Preface

Article 174 of the Lisbon Treaty states that “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.” European policy debate on the development of territories with geographic specificities in the past years has been moving away from the discussions on the need to compensate for the “natural handicaps” and develop a special policy or instrument “per handicap/ specificity”. The discourse nowadays, while still acknowledging the specific challenges of these places, is more oriented on the need to reveal and strengthen their development potentials.

Within Europe these regions have unique geographical characteristics in which the identification of competitive opportunities is linked to their specific advantages and territorial assets. These vary by region and the key policy question then is how to better explore these unique assets by reducing and overcoming development challenges? The concepts of place-based approach and smart approaches seem very suitable at supporting factors for sustainable growth in these territories such as labour market, small and medium-sized enterprises, territorial cooperation, innovation and infrastructure.

This working paper sets out the territorial context related to territories with geographical specificities: coastal areas, islands, mountains and sparsely populated regions and includes key messages for policy-makers for designing and implementing development strategies specifically tailored to the needs of these places.

The working paper was prepared by the ESPON EGTC at the initiative of the Maltese Presidency of the Council of the European Union and with the support of Spatial Foresight GmbH and Spiekermann & Wegener.

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Abbreviations

DG REGIO	European Commission, Directorate-General for Regional and Urban Policy
ESPON	European Territorial Observatory Network
ESPON space	The member states of the EU plus the ESPON partner countries Iceland, Liechtenstein, Norway and Switzerland
EU	European Union
EU13	The 13 member states that joined the EU in 2004 or afterwards
EU15	The member states of the EU prior to the accession of ten candidate countries on 1 May 2004
EU28+4	See “ESPON space”
GDP	Gross Domestic Product
ICT	Information and Communications Technology
LAU	Local Administrative Unit
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Co-operation and Development
TEN-T	Trans-European Transport Network
USO	Universal Service Obligation

1 Observations for policy consideration

Main territorial evidence messages:

- **Socio-economic conditions in specific types of territories in Europe are very diverse**

Geographic specificity is only one of many factors influencing the performance of islands, mountains, coastal and sparsely populated areas. Differences between specific types of territories and within each group are often linked to the national and regional economic context of each region. Therefore, the geographic specificity may raise additional development challenges but as such cannot provide a comprehensive explanation to the development patterns of these areas.

- **Specific types of territories face diverse demographic challenges**

The demographic challenges that some specific types of territories are facing are structural and permanent. Many specific territories are exposed to depopulation, especially at the sub-regional level (e.g. in remote valleys, small islands, isolated settlements of sparsely populated regions). These trends are often associated with lower proportions of women in the population. Typically, young people have to move to other locations (out-migration) to pursue higher education and only a portion of them move back after graduation.

At the same time, particularly attractive islands, coastal areas and mountain resorts can face other types of demographic challenges, as local communities are negatively impacted by pressures on the real estate market and as negative impacts of high population concentrations on the environment.

- **Specific types of territories are normally characterised by low levels of economic diversification**

Small islands, remote mountain valleys and isolated communities of sparsely populated regions normally have low levels of economic diversification. In order to be competitive, they are forced to specialise in only a few sectors of activity. This exposes them to external shocks and limits their resilience.

Local labour markets need to be sufficiently diverse to offer employment opportunities for youth. Insufficiently diverse labour market can for example lead to limited employment opportunities for women, triggering a gender imbalance which on the medium to long term jeopardizes concerned local communities.

- **Small-scale agriculture and fisheries are important assets in specific types of territories**

A shared challenge in a number of mountainous, insular as sparsely populated areas is small farm size and lower labour productivity. Island fisheries similarly tend to be primarily artisanal. Small size can be compensated for by specialisation in high-added value products, e.g. organic produce, products for niche markets.

This in many cases requires vertical integration between groups of farmers or artisanal fisheries, processing plants and commercialisation activities in order to ensure a viable food-production chain in order to increase the competitiveness of sectors that can add considerable value within the region. Co-operative structures have successfully been established to capitalise on these assets, e.g. in the case of apple production in the Tyrolian Alps. Even in cases where natural resources are exported unprocessed, generating limited added-value co-operative structures have proved helpful.

- **Specific types of territories display a rich biodiversity and high vulnerability to climate change**

Normally geographically specific territories reveal a rich biodiversity, which works as a development factor by offering tourism and recreation activities such as fishing, agro-tourism, hiking, bird or whale watching, and aqua sports.

These territories are also characterised by high vulnerability to climate change, especially in the islands and coastal areas of Southern Europe. Climate change has also an impact on the Alps, decreasing the snow cover and consequently challenging its position as an attractive ski tourist destination.

- **Accessibility: islands, sparsely populated areas and mountains seem to face more challenges than other types of regions**

In terms of accessibility, islands, sparsely populated areas and mountains often face more challenges than coastal and cross-border areas. Air transport therefore plays a major role binding together the European continent; it is particularly important for remote regions. Contrast between road/rail and air accessibility values are particularly pronounced for island regions. In some cases lower accessibility and connectivity as well as a weaker economic base, lead to emigration flows and brain-drain. Inversely, coastal areas (e.g. the Belgian coast) and cross-border regions (e.g. Luxembourg) often have high population density, an entrenched economic structure and access to services and transport systems.

- **Accessibility by the sea and maritime freight is important for import and exports of goods and cruise tourism for islands**

A number of island regions depend on imports for essentials goods such as foodstuffs and energy as well as for most other consumer goods. Costs of living tend to be higher in islands compared to corresponding mainland regions due to constraints for the provision of goods. A second major component of sea accessibility is the possibility of exporting locally produced goods, in particular whether available sea transport meets the need of established and foreseen types of production. Transport needs of a fisheries industry, or of agriculture, can be quite different from those of a manufacturing industry in terms of constraints linked to volumes, cost, frequency and reliability. Finally, cruise tourism can be an important source of tourism for many islands.

- **The overall pattern of potential accessibility by road, rail and air will be relatively stable until 2030**

This situation is mainly due to the distribution of population in Europe but beyond this overall pattern, the development of the TEN-T will yield a lot of improvements in the regional, national and international connectivity.

Accessibility potential by road and rail will continue to show the traditional core-periphery pattern in Europe. The clear dominance of urban regions will continue in the future, rural regions will have about 80% of the road accessibility average of the ESPON space. All regional types in EU15 will perform much better than the same types in EU13. Mountain regions as well as islands will have an accessibility level lower than the ESPON average (about 70% and 80% of ESPON average for road and rail, respectively). Islands and in particular sparsely populated regions will register the lowest accessibility by road and rail by 2030.

In any case, the relative changes of potential accessibility by road yields that the largest relative future increases compared to today will happen in areas with lower accessibility. The relative increases of potential accessibility by rail are much higher than those for road. From the specific regional types, mountain regions and sparsely populated regions are relatively benefitting from TEN-T rail investments, whereas islands and coastal regions are slightly falling behind.

Regarding accessibility by air it is hard to forecast. Besides the issue of appropriate infrastructure in terms of airports, it is a question of the future strategies of the air carrier offering the flight services. However, the overall pattern of regions with higher and lower accessibility will not change dramatically. Of course, individual regions, in particular with regional airports with very few flight services, might be strongly affected. This situation is particularly relevant for low cost airports. According to scenario A, the specific regional types will have much higher accessibility by air compared to the ESPON average than it will be for road and rail.

- **Scale matters and NUTS 3 brings limitations in the analysis**

NUTS3 delineations of specific types of territories bring limitations in the analysis and identification of trends and development patterns in these territories.

First, such delineation focuses on identifying regions where geographic specificity constitutes a predominant geographic characteristic. However, opportunities and challenges linked to geographic specificity occur irrespective of their relative importance within a region. Features such as 'insularity', 'remoteness' or 'sparsity' can be relevant beyond the areas actually identified as specific.

Second, NUTS3 delineations have been considered because this is the lowest level at which a limited selection of regularly updated socio-economic indicators are available. However, opportunities and challenges cannot be identified only on the basis of general socio-economic

indicators. Dialogue with stakeholders and qualitative information to better identify development priorities adapted to each territorial situation are needed.

Third, NUTS3 delineations of specific types of territories imply that a single geographic scale would be relevant to approach geographic specificity. This does not appear to be the case. For instance, mountain regions can be approached at the level of transnational massifs, and of individual valleys and adjoining valleys. Restricting the approach of specific types of territories to selected geographic scales and administrative levels, such as NUTS3 and NUTS2, limits the scope of actions.

Main policy messages:

- **Functional and place-based approaches when addressing and analysing specific types of territories are necessary**

The ‘typology’ approach to define specific types of territories does not seem to be a satisfactory starting point. The objective should be to address development issues linked to a functional approach based on common features such as insularity, remoteness, demographic sparsity and a coastal situation. These issues are relevant for regions that are marginally concerned by geographic specificity (or even only in the vicinity of specific types of territories), as well as for regions that are primarily insular, mountainous, sparsely populated or coastal. Opportunities of mountain areas can in many instances generate positive social and economic effect in neighbouring lowland areas; obstacles to development in an island may be overcome through targeted measures on other regions.

Performance compared to other specific territories is of secondary importance. Regions cannot be compared against the same benchmarks because different types of regional specialisations create different levels of economic return. Understanding specific processes to inform policy-making is more important than benchmarking and the focus should be on potentials rather than on relative performance of different places.

There is no need to develop a policy “per geographic specificity” and this would not even be possible considering the wide divergence of development trends within each group and overlapping “geographic specificities” (e.g. one area can be mountainous and sparsely populated at the same time). Supporting integrated asset-based development strategies that respect territorial challenges and opportunities is worth considering as a strategic approach.

- **Smart approaches play an important role in supporting sustainable economic development and innovation in specific types of territories**

The main objective should be to identify unique opportunities, not to try to make these territories function in the same way as ‘mainstream regions’. Cultivating ‘uniqueness’ generally offers more promising economic development perspectives and might be also easier to translate into concrete policy actions.

The smart specialisation approach adopted by the EU which combines industrial, educational and innovation policies seems to be relevant for specific types of territories. In particular it is important to select a number of priority areas for knowledge-based investments, focusing on the local assets and comparative advantages. A model of cooperation between universities/research milieus, industry and regional/local authorities may be mobilised in this respect.

Challenges linked to specific types of territories have in some cases been successfully overcome through smart specialisation strategies capitalising on their unique resources and developing high-added value niche-products. For example, renewable energy is identified as a perspective sector, both as a way of satisfying local energy demand and of developing a niche export industry.

- **Access to high-quality broadband should be enhanced**

For an increasingly broad spectre of economic activities, access to high-quality broadband is essential. Providing such access is challenging for a number of specific types of territories. Low population numbers, large distances and challenges linked to the natural environment (e.g. topography, bodies of water) often implies that it is not profitable for private companies to provide broadband to these territories.

In spite of its importance, broadband access is not defined as a 'Universal Service Obligation' (USO) at the European level. Transfers of experience on how these USO's are implemented could be particularly relevant for specific types of territories.

- **Development of policy actions to encourage return migration and counteract population decline**

It seems necessary to design and implement policy actions to encourage return migration and to attract young graduates. Such actions need to be permanent, as the circulation of population otherwise generates a constant loss of inhabitants. Access to services of high quality is increasingly a precondition to avoid population decline. Policy actions to provide access to services of general interest should be integrated as part of development policies in specific types of territories. For transport as for other services of general interest, market actors often do not spontaneously offer a satisfactory level of service provision in specific types of territories. The market basis tends to be weak compared to other regions, which makes it difficult to capitalise on economic development assets. It is therefore important to weigh public expenditure required to offer services in specific types of territories.

In addition, actions targeted to these areas with seasonal variations in population could address the regulation of the housing market and to arrive to better models of territorial development.

- **Policy actions related to accessibility should be mainly focused on existing economic activities and overcome bottlenecks**

The underlying assumption is that increased accessibility will enhance growth and therefore contribute to territorial development. From the perspective of specific types of territories, a more place-based rationale is needed, in which the starting points for reflections on improved accessibility would be the needs of their current economic activities, their development perspectives, and perspectives for improving the living environment of their inhabitants.

Furthermore, extra-European accessibility is important for a number of specific types of territories on the margins of Europe. Iceland has for example imposed itself as an air hub between Europe and North America. Opportunities deriving from these connections can be incorporated in the policy interventions.

- **Development strategies implemented should consider specific vulnerabilities of the physical environmental in specific types of territories and environmental protection measures aimed at generating opportunities for development**

More generally, economic development strategies could consider specific vulnerabilities of the physical environmental in mountain areas, islands and coastal regions. There is extensive evidence on specific processes and risks to be taken into account such as buildings and other infrastructure along the coastline. In addition, monitoring would help to identify possible needs for preventive and risk management measures.

In addition, territorial development strategies should include measures to preserve landscapes and wilderness that constitute assets for tourism development, preserve fish stocks and plants that can be collection for human consumption and for medical purposes. However, their establishment and operation also in some cases lead to conflicts with the local population, notably when nature protection measures generate limitations in the range of activities that can be developed. Therefore, development assets often have to be balanced with interests of environmental sustainability in order to avoid overexploitation of resources and damages from mass tourism.

- **Small-scale economic activities in specific types of territories should be preserved**

There is a wide political agreement that small-scale agriculture and fisheries should be preserved in specific types of territories. In this context, their products should be able to compete on European markets and compensatory measures might be considered as an option. In particular, actions related high added-value products or protected designations of origins have also significantly contributed to preserve these economic activities. Transfers of good practice can help to diffuse lessons learnt from such initiatives across Europe.

The viability of agricultural and fisheries activities can be improved by combining them with other types of activities. Agrotourism and tourism-fishing are well-known examples. There are also examples of innovative initiatives such as the creation of small-scales homes for elderly

persons in combination with farming activities. Multi-activity is often the key to economically sustainable development.

Finally, policies to agriculture, forestry and fisheries in specific types of territories may also be justified with reference to the 'public goods' or 'ecosystem services' they produce. These trends all point to the need for more integrated approaches of agriculture, forestry and fisheries in specific types of territories.

2 Territorial development patterns and trends in specific types of territories

Territorial development patterns in specific types of territories for selected indicators are presented below in box plots. In addition, a broader picture and benchmarking of these territories in relation to other regions in Europe is presented in maps.

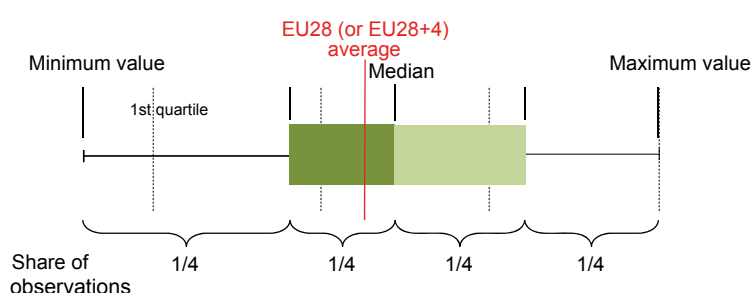
Infobox: reading boxplots

Possibly significant differences between groups of regions belonging to each category of geographic specificity and other parts of Europe are explored in boxplots. Each boxplot is produced by dividing the regions of each category in four equal groups (i.e. 'quartiles'), the first of which corresponds to the 25% of regions with the lowest values (1st quartile), while the last one corresponds to the 25% of regions with highest values (4th quartile). The remaining 'middle' regions are then again divided in two groups, by using the same principle: 25% of regions with lower values in the 2nd quartile, 25% of regions with higher values in the 3rd quartile.

The boxplot then focuses on the extreme values observed in each of these 4 quartiles. The extreme values of the 2nd and 3rd values constitute the limits of the 'box': 50% of regions have values within this 'middle range'. The lowest and highest values of all regions are shown using 'whiskers' that extend from this box.

This provides a number of indications on the spread of values: a narrow box with long whiskers for example implies that most regions have similar values, but that values are significantly different in a smaller number of regions. On the contrary, a wide box with narrow relatively short whisker implies that there values are relatively dispersed, but that there are no regions have extreme values that distinguish them clearly from others.

The reference to EU28 or EU28+4 was also considered depending on the data considered. This is useful for benchmarking purposes and to understand the situation of each specific type of territory in a broader context.

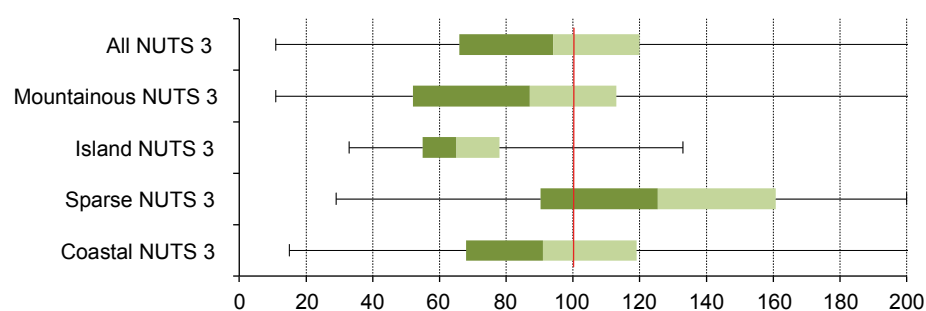


2.1 Patterns of economic growth vary across Europe but island regions tend to be distinctly lower than the EU average

Mountainous and coastal regions have diverse GDP per head (figure 2.1). Values observed in island regions tend to be distinctly lower than the EU average, while the opposite is true for sparsely populated areas. This can however be ascribed to the fact that a majority of island regions are found in Greece, southern Italy, Spain and outermost regions, while sparsely populated areas are mainly found in the Nordic countries and Scotland. Differences between categories are therefore mainly linked to the national economic context of each region.

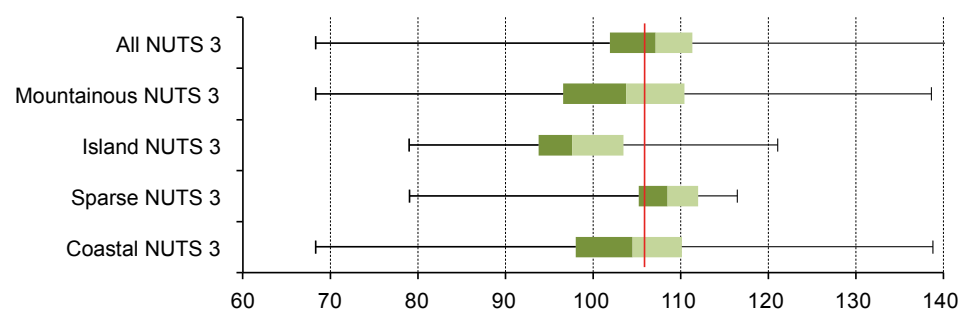
Patterns with regards to GDP growth are similar to those regarding GDP/head levels (map 2.1; figure 2.2). The high growth values observed in some islands (Gotland, Isle of Wight, Åland and Malta) may in some cases reflect the volatility of some island economies. Islands with less population tend to specialise within a limited number of sectors. They are vulnerable to economic cycles and fluctuations on world markets within these sectors. This vulnerability is accentuated by the fact that the workforce cannot commute to neighbouring regions during economic downturns. On the other hand, this situation has in many cases generated an enhanced capacity of adaptation and entrepreneurship. Overall, this vulnerability generates stronger decline as a result of the financial crisis, followed by more intense catching-up phases in the following years. However, this concerns island states to a greater extent than island regions, insofar as the latter may benefit from national redistribution mechanisms.

Figure 2.1: Distribution of GDP per head (2013) within different categories of specific types of territories



EU28 average: 100%

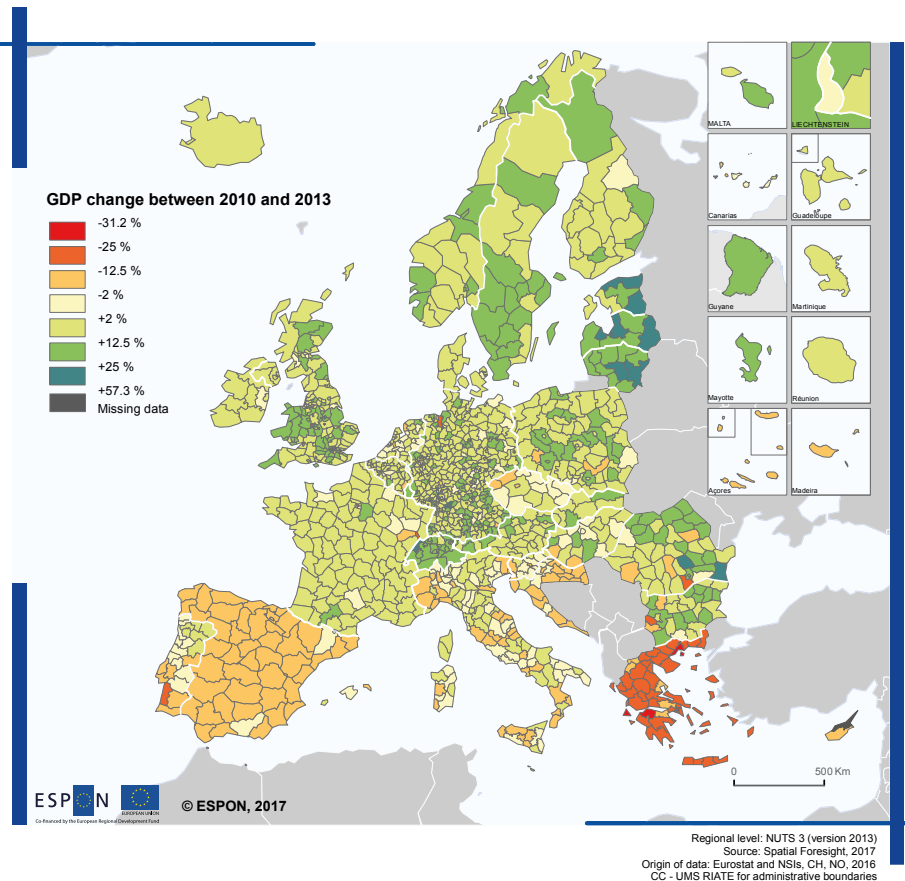
Figure 2.2: Distribution of GDP change (between 2010 and 2013) within different categories of specific types of territories



EU28+4 average: +6.4% between 2010 and 2013

Note: It should be kept in mind that comparisons of GDP per head levels in European NUTS3 regions are not always meaningful. Some urban regions are considerably smaller than the functional urban area. This for example implies that some urban core area that attracts workers from surrounding areas have a ratio that is disproportionally high. One can therefore generally disregard the highest observed values, as these largely result from this statistical bias.

Map 2.1: GDP change 2010-2013 (NUTS 3)



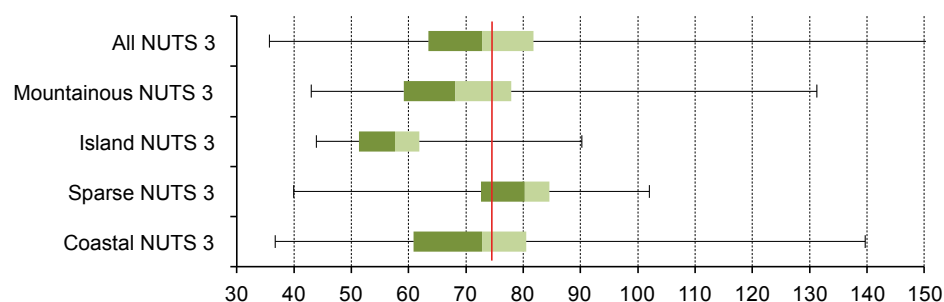
2.2 Employment appears significantly lower for island regions

Employment rates are not available on NUTS 3 level for all of Europe. Therefore, employment is measured based on the number of employed persons at place of work divided by working age population (20 to 64- year olds) at place of residence. Employment is slightly lower for mountain regions than for Europe as a whole, while they are significantly higher for sparsely populated regions and significantly lower for island regions (map 2.2; figure 2.3). The main explanatory factor for these differences is, as for GDP/head level, the way in which these categories of territories are distributed across the EU territory. The lowest level of employment is observed in Western Athens region; the fact that this region is coastal region can hardly be considered as an explanatory factor.

Similarly, the lowest level of employment in sparsely populated areas are found in French Guiana and in the Croatian county of Lika-Senj (Ličko-senjska županija) (40 and 46%, respectively). Sparsity is in the former case less important than the post-colonial social and economic situation. The highest levels are found in sparsely populated regions that are also insular (Åland, Orkney Islands, Shetland Islands and Western Isles) as well as in regions of northern Sweden (Norrbotten, Västernorrland, Jämtland and Västerbotten) and one Scottish constituency (Caithness & Sutherland and Ross & Cromarty).

Scottish islands boast high levels of self-employment and attract workers from other regions to fill vacant positions. In- and out-migration in sparsely populated regions can, to a greater extent than for other regions, be driven by employment opportunities. This implies that persons without employment will tend to settle outside of these regions. Perhaps surprisingly, the Greek inland region of Evrytania also has a high level of employment. The particularly pronounced ageing may in this case play a role.

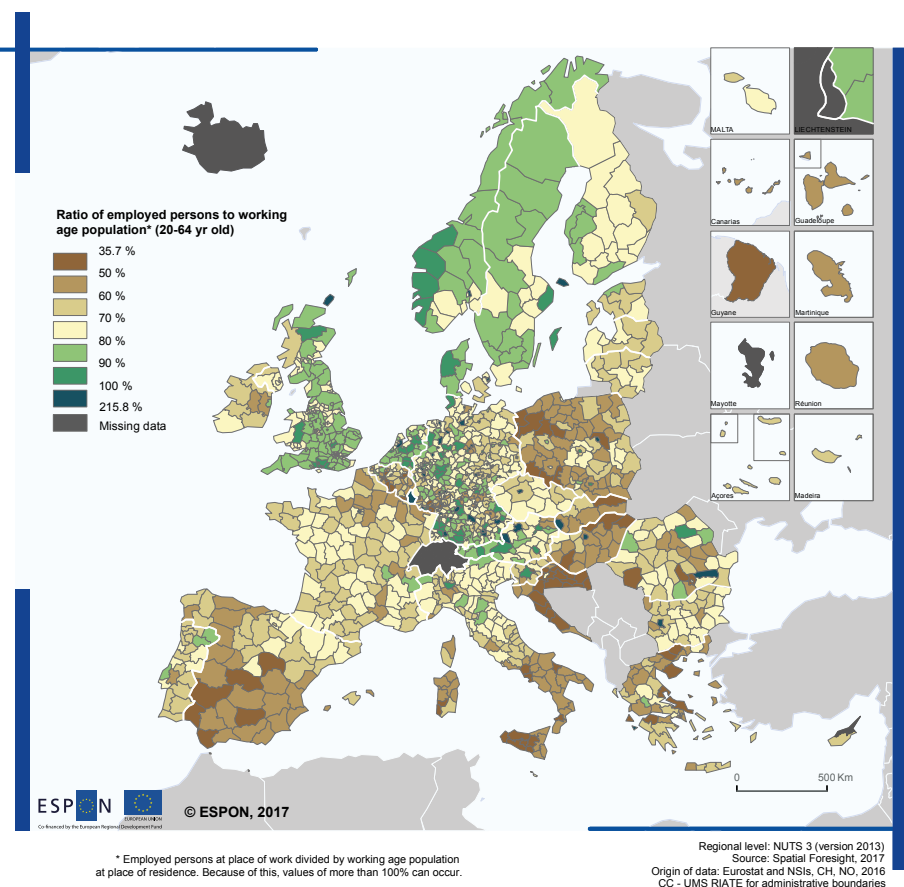
Figure 2.3: Employed persons in relation to working age population (20 to 64- year olds, 2014) within different categories of specific types of territories*



EU28 average: 74.1%; * Employed persons at place of work divided by working age population at place of residence.

Note: This indicator has a similar statistical bias to GDP/head values, as cross-border commuting patterns generate situations in which workers live in one region and work in another one. Rates above 100% therefore typically occur in some urban core regions and in areas with cross-border in-commuting.

Map 2.2: Employed persons in relation to working age population 2014 (NUTS 3)



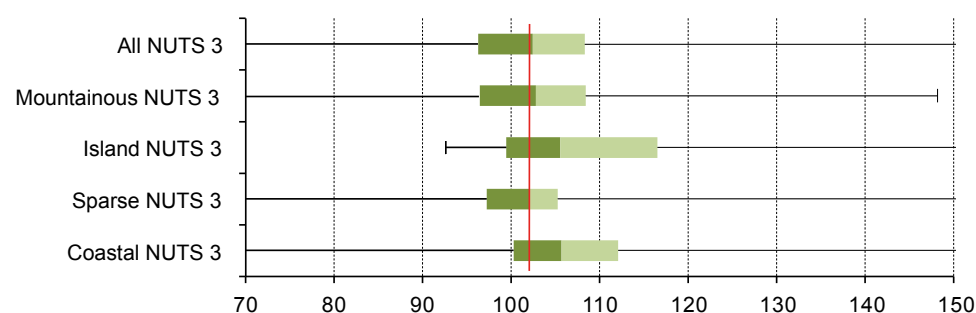
2.3 Demographic change: island and coastal regions tend to have slightly higher population growth

Population developments have significant territorial consequences and are diverse in European regions (map 2.3). Island and coastal regions tend to have slightly higher population growth when compared to other regions. Island regions stand out as no insular region has experienced a population decline of more than 10% between 2001 -2015 (figure 2.4). Danish Island of Bornholm decreased population by 9.53%, followed by the Greek islands of Kerkira (-7.4%) and Lesvos (-6.4%). At the other end of the scale, Fuerteventura and Lanzarote in the Canary island registered a population increase by 85.4%, while the population of Ibiza (Eivissa) and Formentera increased by 69%. Such population growth, which should be considered in conjunction with growth in the number of tourist nights in attractive tourist destinations, generates challenges for planning and resource management.

Larger population change among sparsely populated regions are observed in French Guyana (+52%) and Evrytania (-38%), both of which as previously described for different reasons correspond to special cases. Population growth in regions such as Aust-Agder, Troms and Nord-Trøndelag (Norway) or Åland and Northern Ostrobothnia (Pohjois Pohjanmaa) (Finland) is in fact concentrated in and around cities and large towns. The sparsely populated parts of these regions, with few exceptions, experience depopulation. In Iceland, population growth of +9.15% is concentrated in Reykjavik and around Akureyri, but selected smaller settlements on the West Coast also experience population growth.

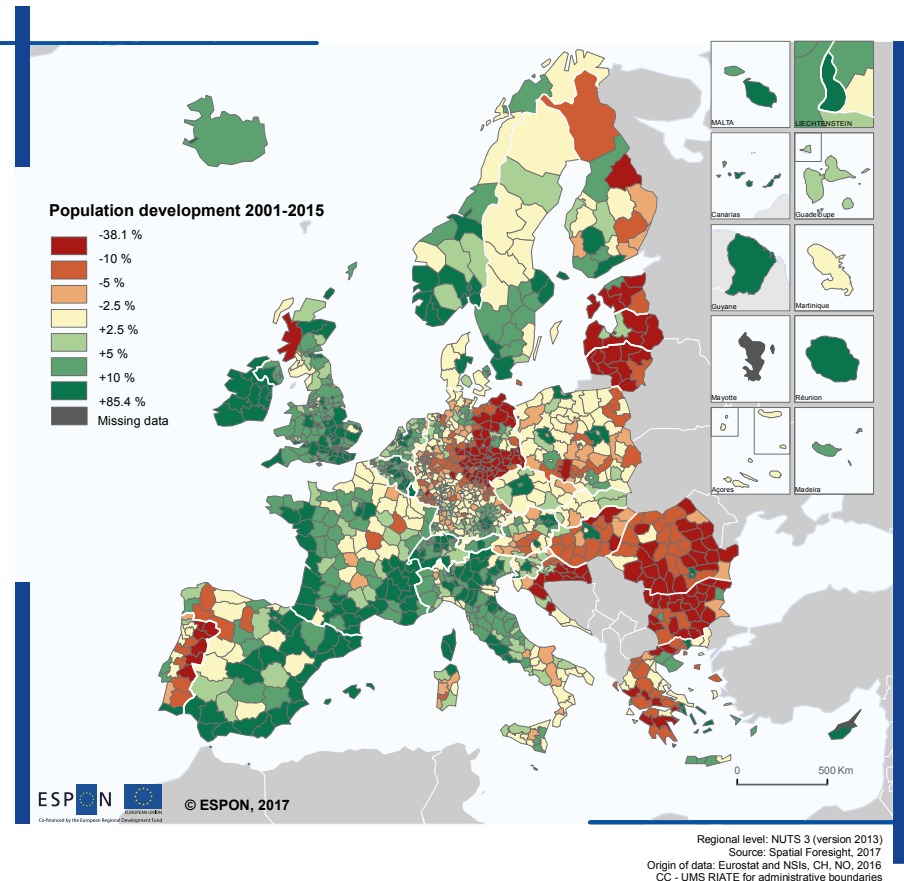
Population growth among mountain regions is highest in Spanish regions neighbouring the Madrid region (Guadalajara) or attractive regions such as Girona and Tarragona in Catalonia, Almería in Andalusia and Tenerife. Declining mountain regions are typically rural, e.g. Evrytania in Greece (-38%), Suhl in Thuringia (Germany) (-24,6%), a number of remote regions in Bulgaria and Romania and the Eastern parts of the Highland and Islands. Observed patterns therefore result from a combination of national demographic trends and remoteness.

Figure 2.4: Distribution of population change (2001-2015) within different categories of specific types of territories



EU28+4 average: +2.3% between 2001 and 2015

Map 2.3: Population development 2001-2015 (NUTS 3)



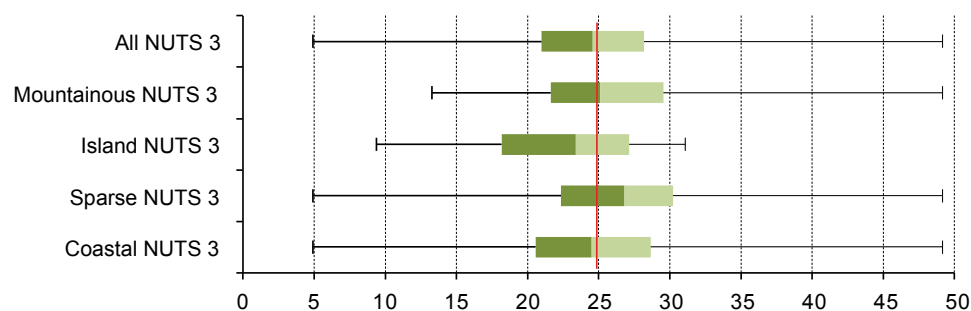
2.4 Age structure: old age dependency ratios appear significantly lower in island regions

Island regions stand out with old age dependency ratios that are significantly lower than for Europe as a whole. Ratios are particularly low in the Canary islands, Azores, large parts of Ireland, Cyprus and Iceland (figure 2.5). The highest values are observed on the Isle of Wight and Bornholm (with more than one inhabitant over 65 for every three working-age inhabitants), on Greek islands and on the Oristano region in central Sardinia. Malta has an old-age dependency ratio of 0.21 (1 inhabitant over 65 for just under 5 working-age inhabitants), while the ratio in neighbouring Gozo and Comino is 0.25 (1 inhabitant over 65 for 4 working age inhabitants) (map 2.4).

The lowest old age dependency ratios are found in e.g. French Guyana, Canary Islands and British urban core regions. Mountain regions have slightly higher, starting with a ratio of 0.13 in the Slovak region of Presov (Prešovský kraj). The median value is slightly higher for mountain regions than for Europe as a whole.

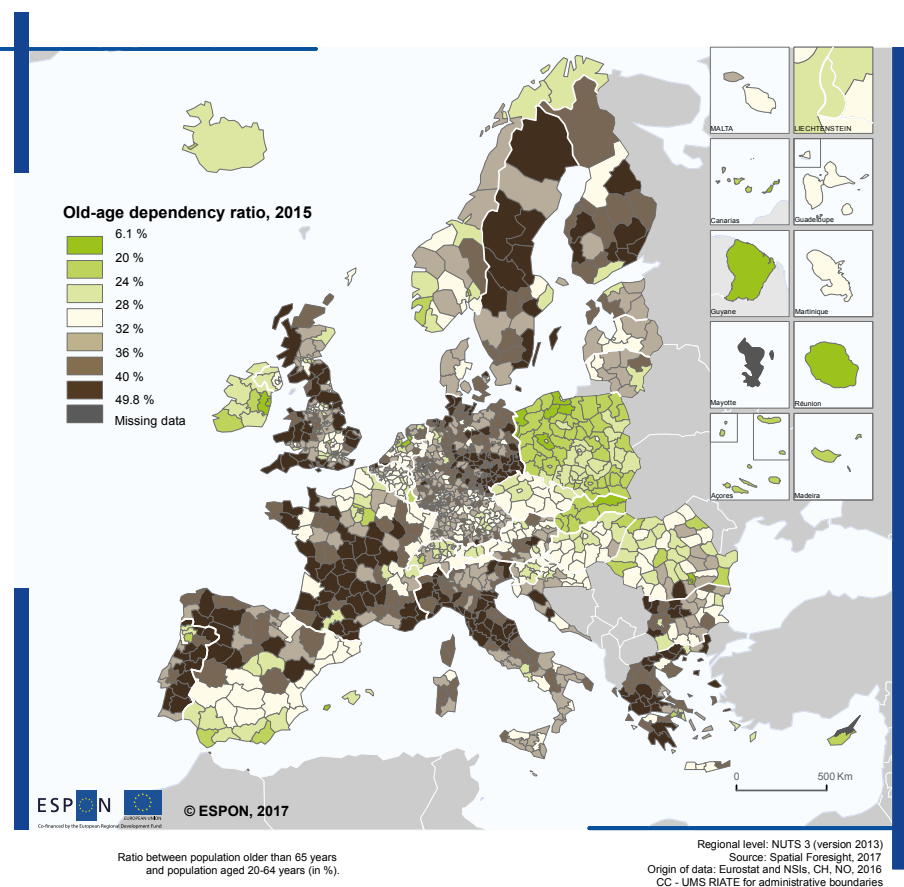
Sparsely populated regions tend to have higher old age dependency ratios. Ratios are particularly high in south European sparsely populated regions such as Evrytania (Greece), Soria and Teruel (Spain) and in the Croatian county of Lika-Senj (Ličko-senjska županija), while they are low in French Guyana and Norway. Finnish regions display a combination of low values (Northern Ostrobothnia (Pohjois-Pohjanmaa)) and high values (South Savo (Etelä Savo), Kainuu).

Figure 2.5: Distribution of old age dependency ratio (2014) within different categories of specific types of territories



EU28 average: 24.8%, i.e. 1 person above 65 years for just above 4 persons aged 20-64.

Map 2.4: Old-age dependency ratio, 2015 (NUTS 3)



2.5 Limitations of NUTS3 typologies

Addressing the opportunities and challenges of specific types of territories implies that these territories need to be considered in context rather than 'singled out'. When considering specific type of territories in relation to their territorial surroundings, it becomes possible to design co-operative and integrated solutions. Specific types of territories are then envisaged as opportunities for the regions they belong to and for Europe as a whole.

NUTS3 delineations of specific types of territories seem for different reasons be counter-productive for the elaboration of a strategic framework based on this approach. First, such delineation focuses on identifying regions where geographic specificity constitutes a predominant geographic characteristic. However, opportunities and challenges linked to geographic specificity occur irrespective of their relative importance within a region. As observed above, the population and economic, social and institutional actors for which a policy addressing 'mountainousness', insularity' or 'sparsity' can be relevant extends beyond the areas actually identified as specific.

Second, NUTS3 delineations have been considered because this is the lowest level at which a limited selection of regularly updated socio-economic indicators are available. However, opportunities and challenges cannot be identified on the basis of general socio-economic indicators. Dialogue with stakeholders and detailed qualitative and quantitative analyses of development patterns adapted to each territorial situation are needed.

Third, NUTS3 delineations of specific types of territories imply that a single geographic scale would be relevant to approach geographic specificity. As shown in this working paper this does not appear to be the case. 'Mountainousness' can be approached at the level of transnational massifs, and of individual valleys and adjoining valleys. Restricting the approach of specific types of territories to selected geographic scales and administrative levels, such as NUTS3 and NUTS2, limits the scope of actions.

3 Accessibility and accessibility scenarios

Accessibility is a key component of the attractiveness of cities and regions and plays an important role in decisions on where to work, live and invest. Even in this era of the information society and virtual trade, the need for travel has not diminished, in fact, the opposite is true. The future of transport in Europe is of high priority at all policy levels.

Infobox: measuring accessibility

The term accessibility (as used in ESPON) expresses how easy people in one region can reach people in another region. Accessibility of a region is indirectly a measure for the potential for activities and enterprises in the region to reach markets and activities in other regions.

The potential accessibility trends for transport by air, road and rail, as well as accessibility by the sea have been analysed independently to show differences between the different transport modes. Potential accessibility is based on the assumption that the attraction of a destination increases with size, and declines with distance, travel time or cost. Here, destination size is represented by region population. Thus, potential accessibility to population is seen as an indicator for the size of market areas for suppliers of goods and services.

Within the accessibility model used by ESPON potential accessibility is based on two elements: (1) population in NUTS 3 regions and (2) the effort in time to reach them. The accessibility model measures the minimum travel time between all NUTS 3 regions for rail, road and air separately. The potential accessibility of a NUTS 3 region is calculated by summing up the population in all other European regions, weighted by the travel time to go there.

Source: Spiekermann and Schürmann (2014) Update of maps: Travel time matrices on road, rail, air and multimodal for 2001, 2006, 2011 and 2014

For more information about potential accessibility within ESPON, please consult www.espon.eu

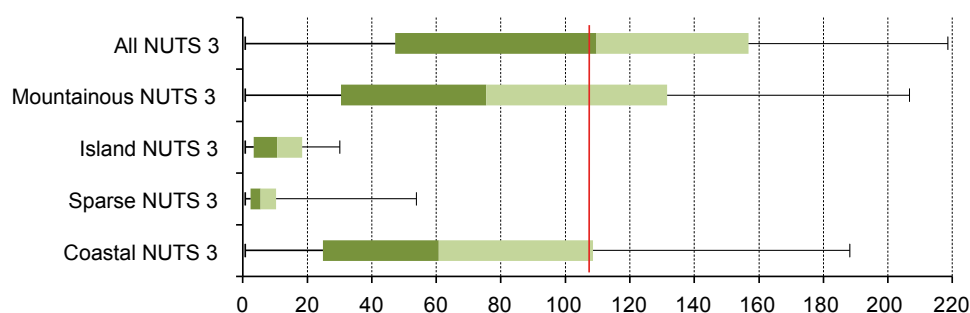
3.1 Accessibility in specific types of territories

Road and rail accessibility is considerably lower for insular and sparsely populated regions than for other European territories (figures 3.1 and 3.2). Islands have higher road accessibility than sparsely populated areas. This is primarily linked to the demographic mass of Europe's largest islands (e.g. Iceland, Ireland and Sicily) and to a lesser extent to the greater proximity of some island regions to major population concentrations (e.g. Isle of Wight). Within the group of sparsely populated regions, there is a sharp divide between regions situated in southern Europe, with higher accessibility, and those situated in northern Europe.

One can also observe that median road accessibility is distinctly higher in mountain regions than in coastal regions, while rail accessibility is roughly equivalent. This in particular reflects the central position of Central European Middle Mountains. However, the accessibility of remote valleys within NUTS3 regions is not reflected in this analysis.

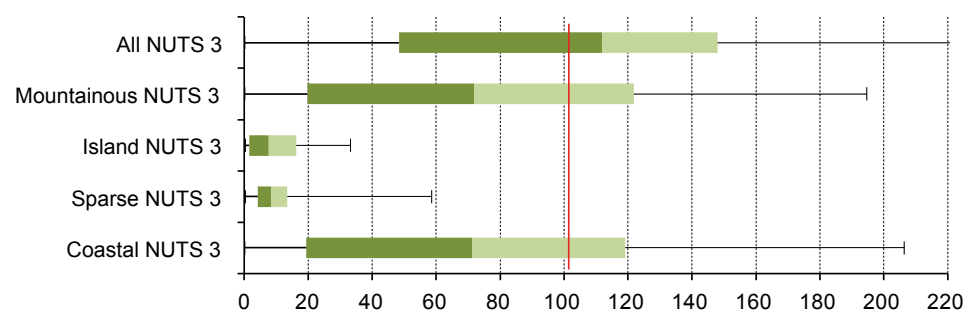
Air accessibility levels are both less contrasted within each category, and when comparing median values and distributions between categories (figure 3.3). Air transport therefore plays a major role binding together the European continent; it is particularly important for remote regions. Contrast between road/rail and air accessibility values are particularly pronounced for island regions. There are also major differences for sparsely populated regions, even if observed accessibility values are distinctly lower than for islands. This is in spite of the fact that only the major urban centre is considered, which generate a particularly important bias for air accessibility in sparsely populated regions.

Figure 3.1: Distribution of accessibility by road (2014) within different categories of specific types of territories



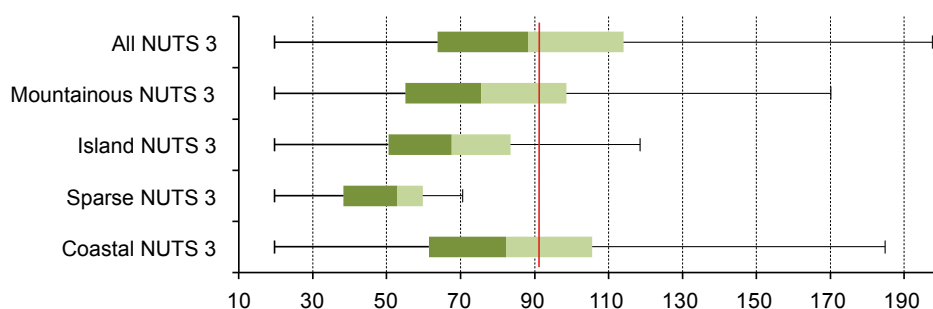
EU28 average: 107.2%

Figure 3.2: Distribution of accessibility by rail (2014) within different categories of specific types of territories



EU28 average: 101.4%

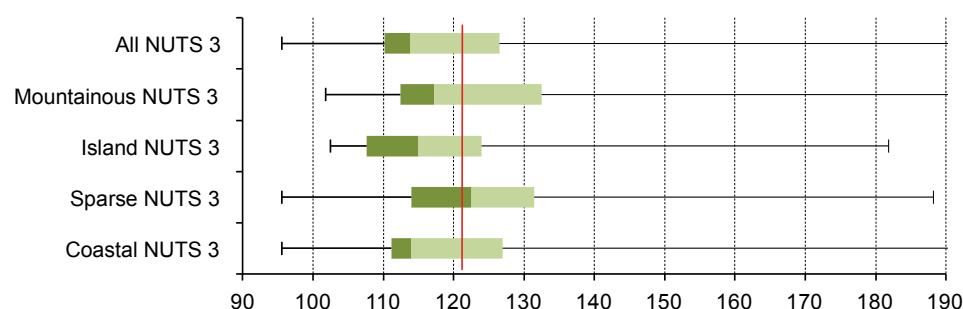
Figure 3.3: Distribution of accessibility by air (2014) within different categories of specific types of territories



EU28 average: 91%

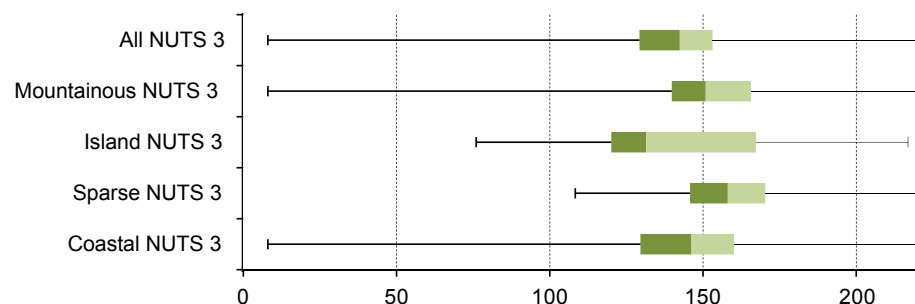
When comparing changes in accessibility levels between 2001 and 2014 (figures 3.4, 3.5 and 3.6), one observes that growth in road and rail accessibility is less pronounced for island regions. Infrastructure improvements on the European continent therefore tend to accentuate the relative contrast with island regions. Sparsely populated regions, on the other hand, have benefited particularly from improvements in road and rail accessibility. This is also linked to their particularly low initial level of accessibility in 2001. Decreases of rail accessibility above 5% correspond to a small group of Greek regions on the Peloponnese peninsula.

Figure 3.4: Distribution of accessibility by road relative change (between 2001 and 2014) within different categories of specific types of territories



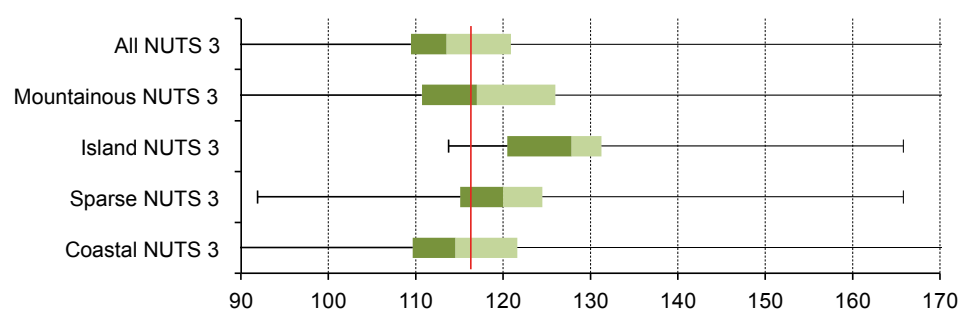
EU28+4 average: +2.7% between 2001 and 2014

Figure 3.5: Distribution of accessibility by rail relative change (between 2001 and 2014) within different categories of specific types of territories



EU28+4 average: +44.6% between 2001 and 2014

Figure 3.6: Distribution of accessibility by air relative change (between 2001 and 2014) within different categories of specific types of territories



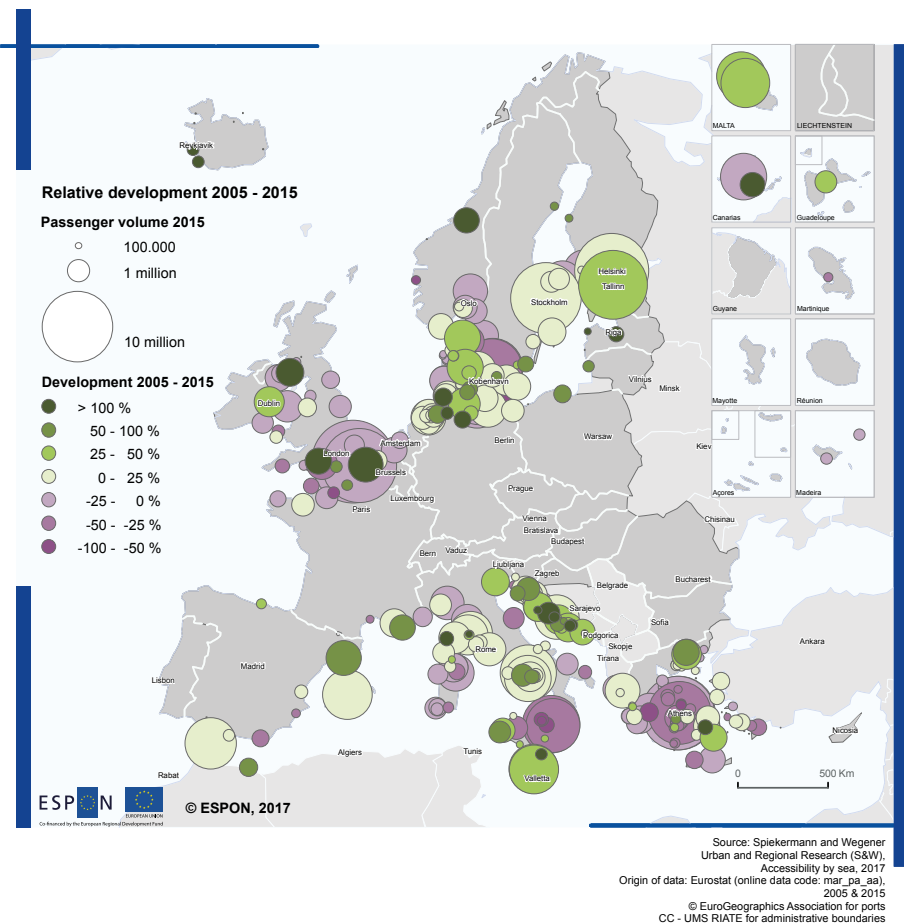
EU28+4 average: +16.2% between 2001 and 2014

A number of island regions depend on imports for essentials goods such as foodstuffs and energy as well as for most other consumer goods. Maritime freight is the central means of transport for these imports. Costs of living tend to be higher in islands compared to corresponding mainland regions due to constraints for the provision of goods.

A second major component of sea accessibility is the possibility of exporting locally produced goods, in particular whether available sea transport meets the need of established and foreseen types of production. Transport needs of a fisheries industry, or of agriculture, can be quite different from those of a manufacturing industry in terms of constraints linked to volumes, cost, frequency and reliability.

Finally, cruise tourism can be an important source of tourism for many islands. It is important to identify if the island possesses adequate port facilities and whether it can offer tourism capable of attracting cruise vessels.

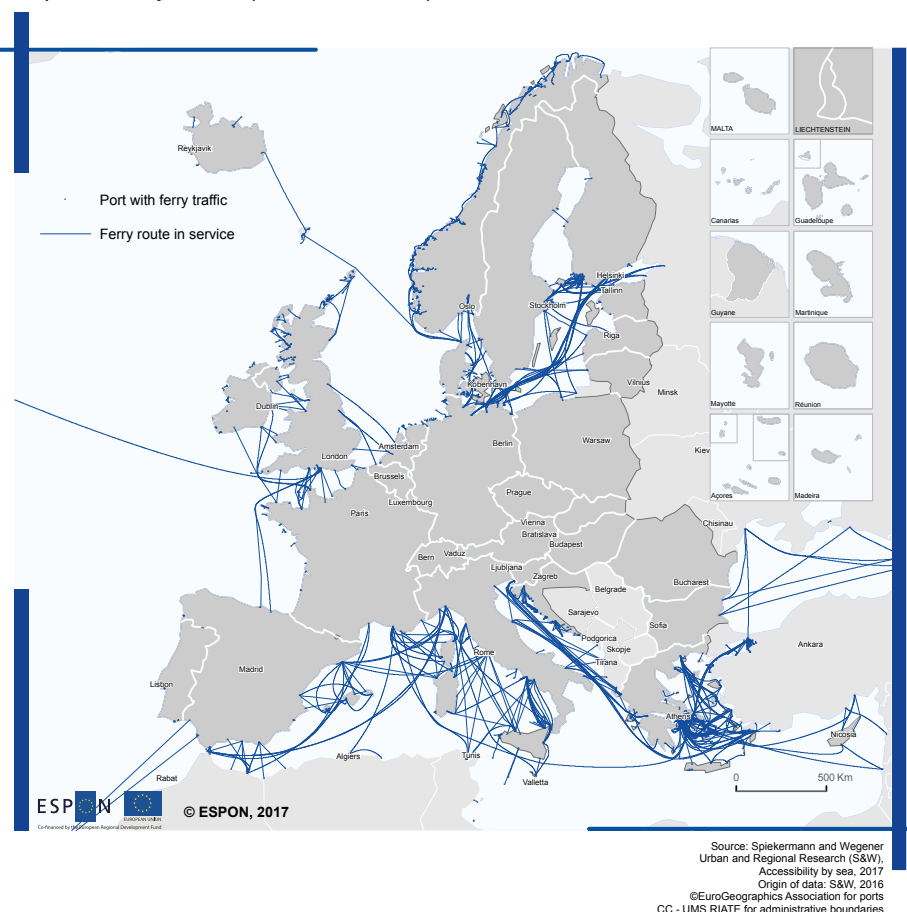
Map 3.1: Development of maritime passenger traffic 2005-2015



Accessibility by sea at port level considers also transport volumes and flows, ferry networks and indicators describing hinterland accessibility of ports. The maritime ports¹ in Europe are very heterogeneous in many respects. To mention only a few types, there are the big multipurpose ports, ports having passenger or goods transport only, ports with specialised goods categories, ports having only ferry traffic or pure touristic marinas.

There is a broad range of ports with passenger traffic. The development of maritime passenger traffic in European ports during the last ten years is very heterogeneous (map 3.1). Most ports have experienced an increase in passenger traffic. This is true, with some exceptions for ports in the Baltic Sea and the Mediterranean. In Italy, some ports lost passenger traffic, the same happened to the large ports in Greece. Also in the Channel area, the larger ports lost some traffic, but several smaller ports gained. However, ports with a decrease in maritime passengers do mostly have substantial amounts of passenger traffic today.

Map 3.2: Ferry routes (November 2016)

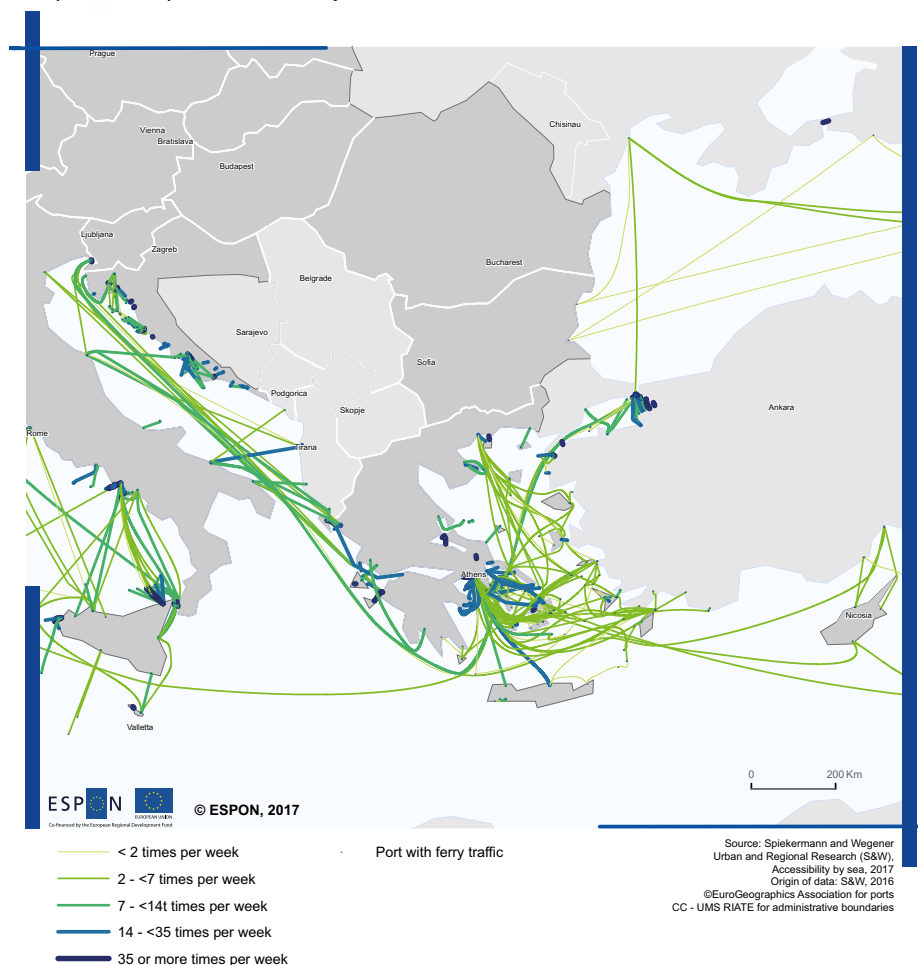


¹ Ports are considered for which EUROSTAT's maritime transport statistic provides data and also those ports which have ferry traffic. In addition, those ports that are classified as maritime ports of the TEN-T network are included.

Maritime passenger traffic in ports comes either from ferry passengers or from tourists doing a cruise. European coastal regions and islands have developed a rather dense ferry network (maps 3.2 and 3.3). These ferry lines provide important services for those types of regions. In several areas, ferry lines are important for daily life. However, the handling of touristic traffic, freight traffic and related economic impacts might be more important for the development of those regions.

An important touristic and economic factor for several European port cities is the cruise business. Here, cruise passenger volume in ports has to be differentiated by those that start or end a cruise in a certain port and those which are on an excursion in the port city because the cruise ship is doing a call at that harbour (map 3.4). Many port cities in the Mediterranean Sea are called for interim stops of a cruise, larger ports in the northern parts are in addition also start or end points of a cruise. The maritime passenger traffic of Malta is comparably high. This is mainly due to ferry traffic within Malta and to Italy. Malta is also a starting point and, more important, an excursion point for cruise passengers. Total passenger volume of Malta has substantially increased during the last ten years.

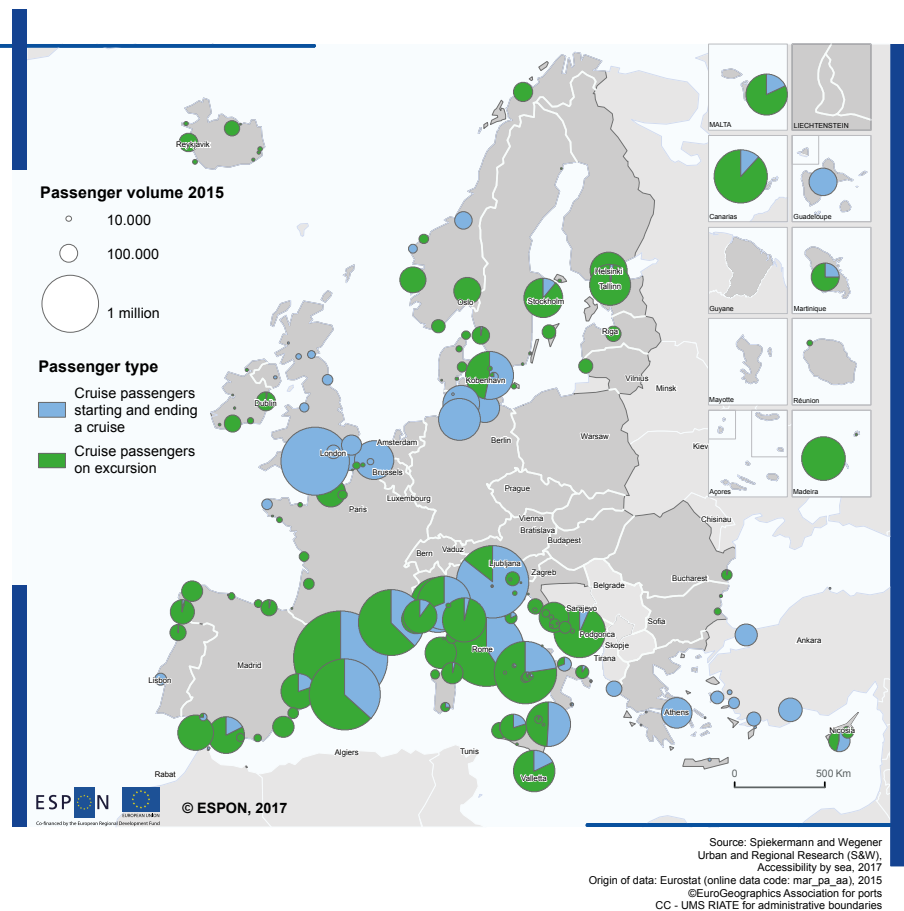
Map 3.3: Frequencies of Ferry Routes



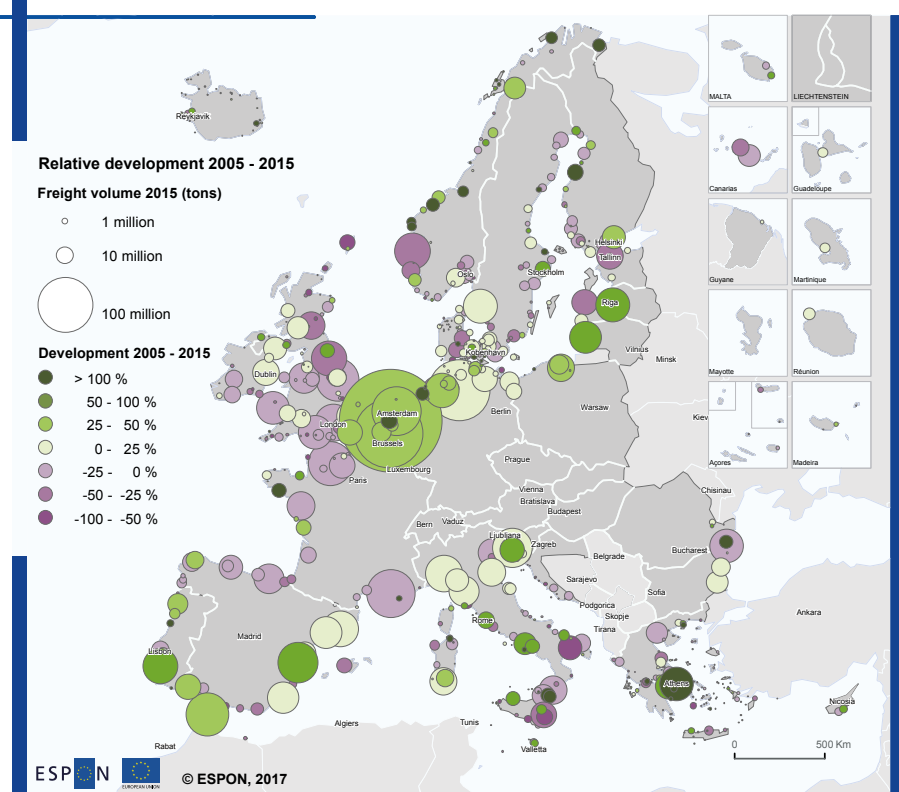
Maritime freight transport seems to be of higher importance for coastal regions and islands in Europe than maritime passenger traffic. Along all coastal areas in Europe, there is a dense chain of freight ports. The development of maritime freight volumes during the last ten years is very heterogeneous (map 3.5). Except some concentration of ports with shrinking volumes in the western Channel area and the UK, all other parts of Europe see growing and shrinking ports. This is probably an outcome of the very different specialisation of individual ports, the development paths of the ports through the years of the crises, but also an indication for the competition and restructuring processes going on in the port business.

As important as the sea-side connections of the European ports is the land-side connection. As a proxy for the hinterland accessibility of ports and their market area, the amount of population that can be reached from a port within four hours of road travel time is calculated. Details on this indicator can be found in the methodological annex. It is interesting to note that hinterland accessibility is rather balanced in Europe (map 3.6). Rather low numbers of population in the hinterland can only be found in the sparsely populated Nordic regions, the Baltic States and on most of the islands in Europe. All other ports can potentially serve a hinterland population of at least five million persons, in many cases this is more than 20 million persons.

Map 3.4: Cruise passengers 2015

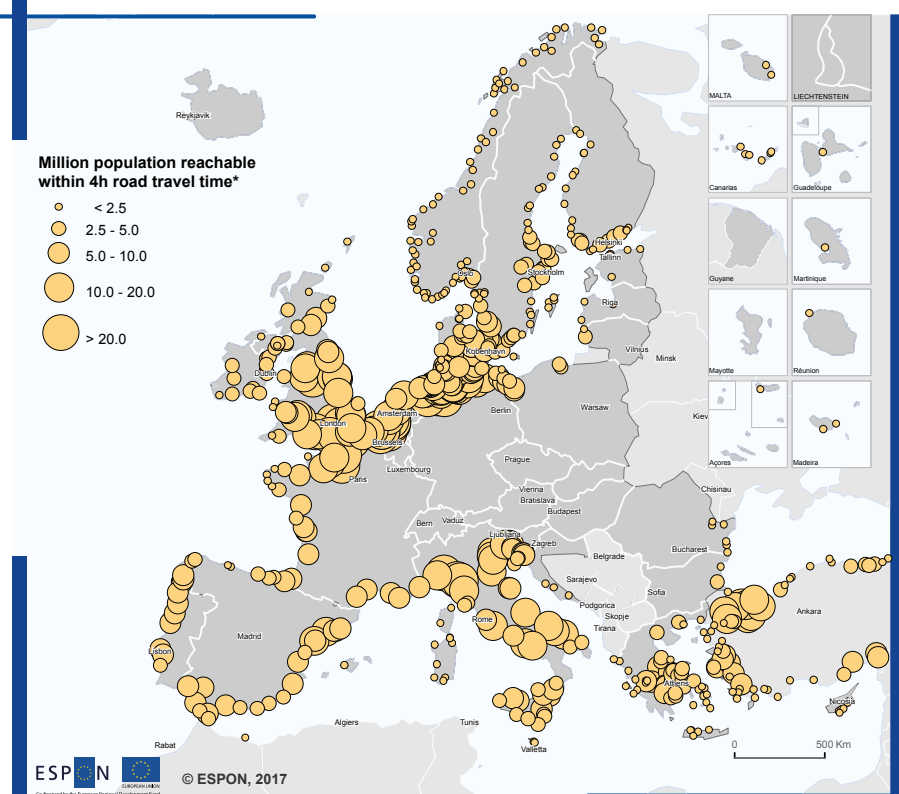


Map 3.5: Development of maritime freight transport (gross weight of goods handled), 2005-2015



Source: Spiekermann and Wegener
Urban and Regional Research (S&W),
Accessibility by sea, 2017
Origin of data: Eurostat (online data code: mar_go_aa), 2005 & 2015
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Map 3.6: Hinterland accessibility of main ports



* This model measures travel time taking into account various parameters, including congestion and road conditions. Therefore, hinterland accessibility should be interpreted as the minimum amount of population reachable within 4 hours. A detailed explanation can be found in the methodological annex.

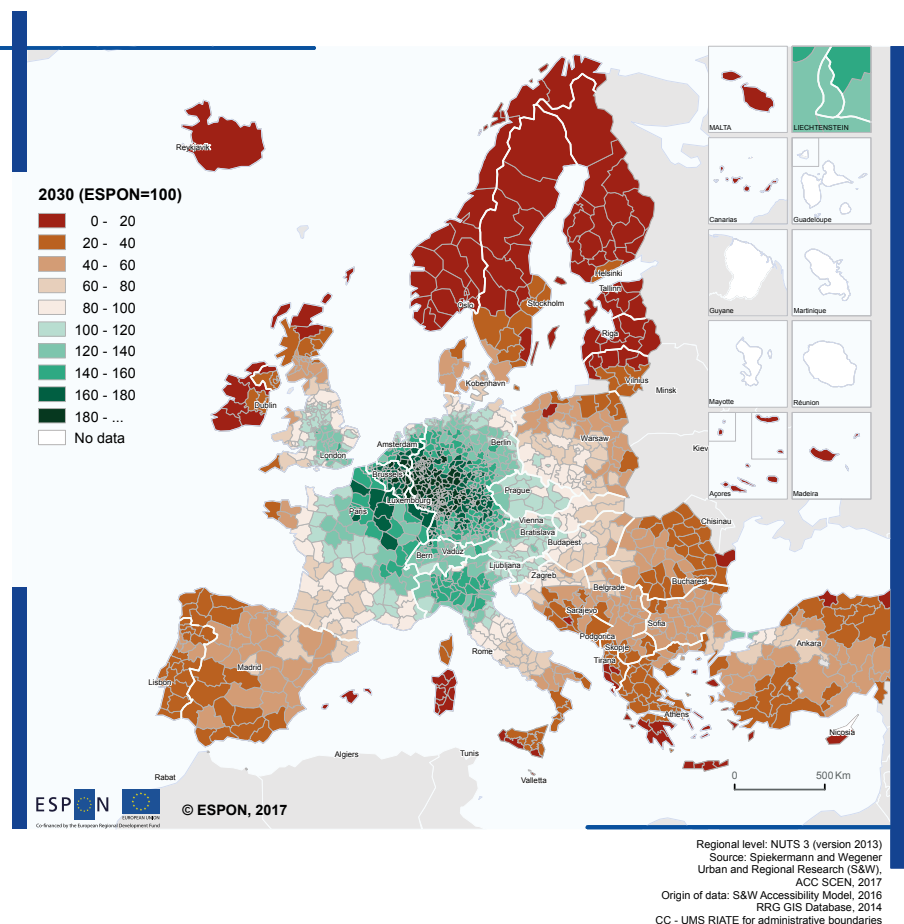
Source: Spiekermann and Wegener
Urban and Regional Research (S&W),
Accessibility by sea, 2017
Origin of data: S&W Accessibility model, 2016
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3.2 Accessibility scenarios² for specific types of territories

The potential accessibility by road scenario is reflecting the development of the TEN-T outline plan for road. Future European accessibility by road will look rather similar to current pattern (map 3.7). Accessibility potential by road will continue to show the traditional core-periphery pattern in Europe. The southern regions of the Netherlands, all regions in Belgium, regions in northern and eastern France and in the western parts of Germany have highest accessibility potential by road in Europe.

Accessibility by road in 2030 will be, as it is the case today, the highest in urban regions and the lowest in rural regions. All rural regions of the ESPON countries will have about 80% of the ESPON road accessibility average. In the EU13 countries, the rural average will be only at about 60% of the ESPON average. Mountain regions will have an average accessibility similar to rural regions and coastal regions will be slightly less (about 70% of ESPON average).

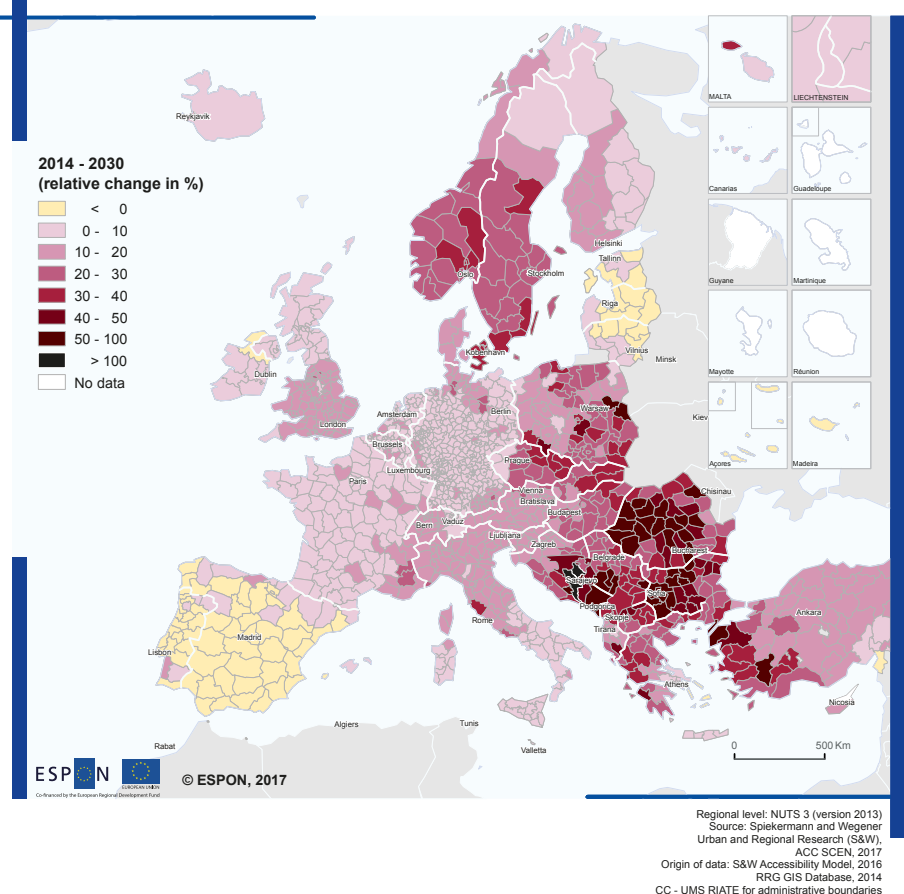
Map 3.7: Accessibility potential by road, 2030



² Scenarios for potential accessibility by rail, road and air accessibility changes until 2030 and 2050, as well as accessibility by the sea have been elaborated by Spiekermann and Wegener, 2016.

A closer look at the relative changes of potential accessibility by road yields that the largest relative future increases compared to today will not happen in areas with highest accessibility but in areas with lower than average accessibility (map 3.8). In particular, the regions in south-eastern Europe will gain through the investments in road infrastructure and between the countries in that area. In relative terms compared to the ESPON average, rural regions will mostly benefit from the road scenario, as well as intermediate regions, but to a lower extent. The dominance of urban regions will be slightly reduced in future. This is because all regional types in EU13 are benefitting whereas all regional types in EU15 are relatively losing out. The specific regional types, mountain regions, islands, sparsely populated and coastal regions will somewhat increase their accessibility through TEN-T investments, however, compared to the ESPON average they will slightly reduce their relative position.

Map 3.8: Changes in accessibility potential by road, 2014-2030



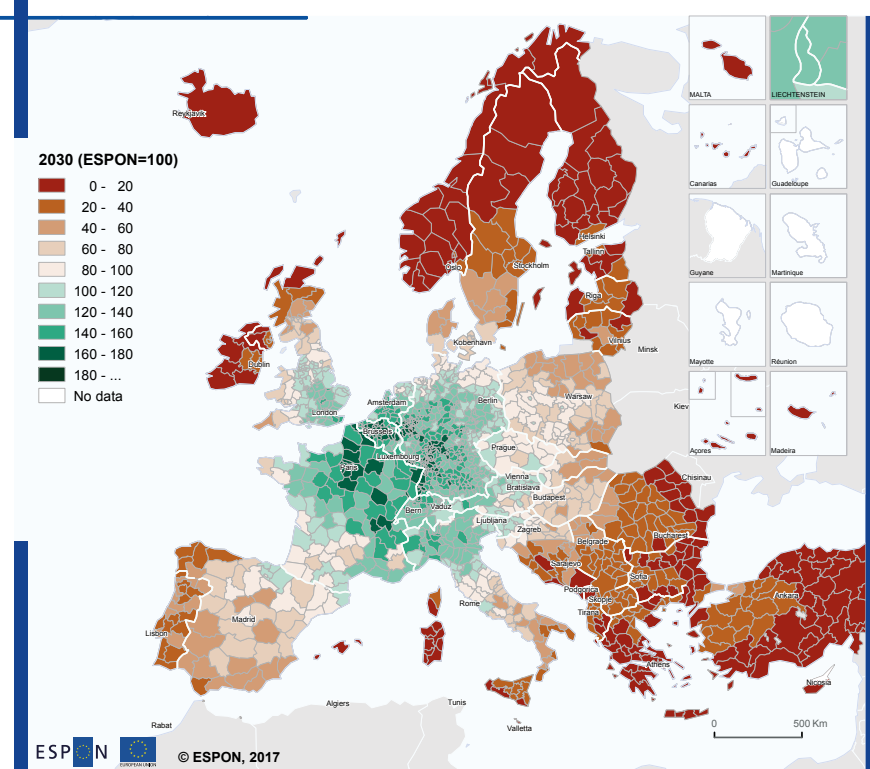
The potential accessibility by rail scenario is reflecting the development of the TEN-T outline plan for rail. The future European accessibility by rail pattern (map 3.9) has a lot in common with the current one. However, disparities between high and low accessibility areas seem to be less pronounced, and, the area of above average accessibility will extend further away from the core. But high accessibility is less evenly distributed in this core area, as regions with top accessibility are forming corridors along high-speed rail links. The clear dominance of urban regions will continue in future, rural regions will have less than 80% of the ESPON average. All regional types in EU15 will perform much better than the same types in EU13. Mountain regions as well as coastal regions will have an accessibility level of about 80% of the ESPON average. As to be expected, lowest accessibility by rail will also in future occur in islands and sparsely populated areas.

The relative increases of potential accessibility by rail are much higher than those for road. (map 3.10). Highest relative gains are to be found in all parts of Eastern Europe, as well as in south-western Europe in parts of France, and in Spain and Portugal. In particular, the development of new high-speed rail lines, but also the upgrade of existing rail infrastructure to high-quality conventional lines in those countries causes these effects.

Rural regions and slightly less also intermediate regions are benefitting from the TEN-T rail scenario, urban regions are clearly reducing their dominance. Again, all regions in EU13 are clearly benefitting whereas urban and intermediate regions in EU15 are relatively losing out. From the specific regional types, mountain regions and sparsely populated regions are relatively benefitting from TEN-T rail investments, whereas islands and coastal regions are slightly falling behind.

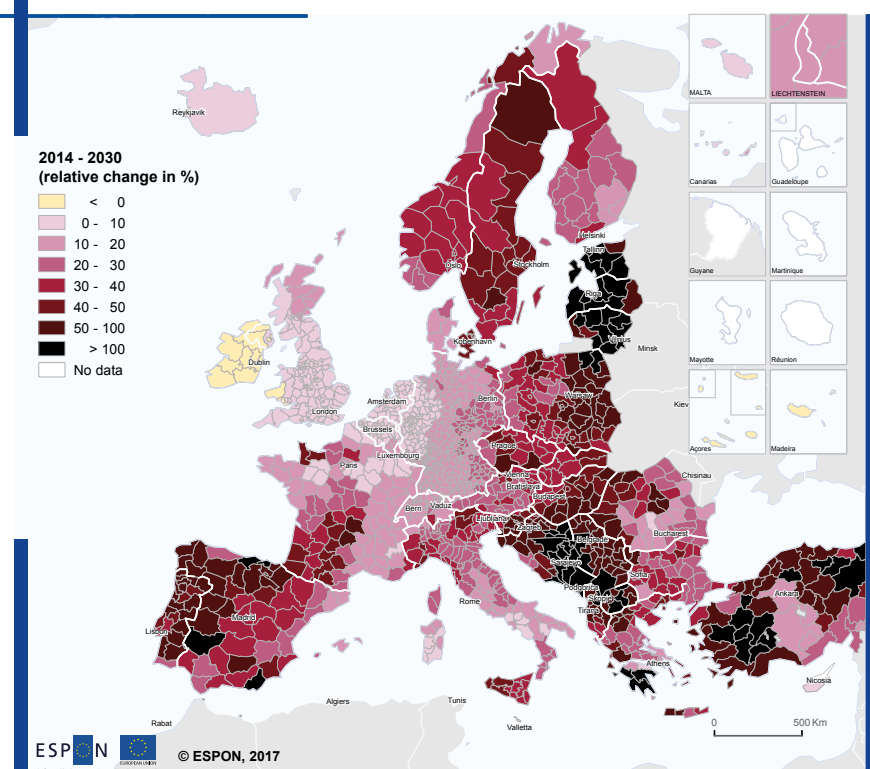
The potential accessibility by air is hard to forecast. Besides the issue of appropriate infrastructure in terms of airports, it is a question of the future strategies of the air carrier offering the flight services. Therefore, three scenarios for the air flight network reflecting three different assumptions on market behaviour but maybe also on political decisions or price changes due to stronger environmental and climate policies have been developed and implemented: Scenario A: Regional airports gaining, Scenario B: Regional airports losing, Scenario C: Air connections reduced. The scenario assumptions are implemented in an increase (scenario A) or decrease (scenarios B and C) of flight services between European airports. However, the overall pattern of regions with higher and lower accessibility will not change dramatically. Of course, individual regions, in particular with regional airports with very few flight services, might be strongly affected. This situation is particularly relevant for low cost airports.

Map 3.9: Accessibility potential by rail, 2030



Regional level: NUTS 3 (version 2013)
Source: Spiekermann and Wegener
Urban and Regional Research (S&W),
ACC SCEN, 2017
Origin of data: S&W Accessibility Model, 2016
RRG GIS Database, 2014
CC - UMS RIATE for administrative boundaries

Map 3.10: Changes in accessibility potential by rail, 2014-2030



Regional level: NUTS 3 (version 2013)
Source: Spiekermann and Wegener
Urban and Regional Research (S&W),
ACC SCEN, 2017
Origin of data: S&W Accessibility Model, 2016
RRG GIS Database, 2014
CC - UMS RIATE for administrative boundaries

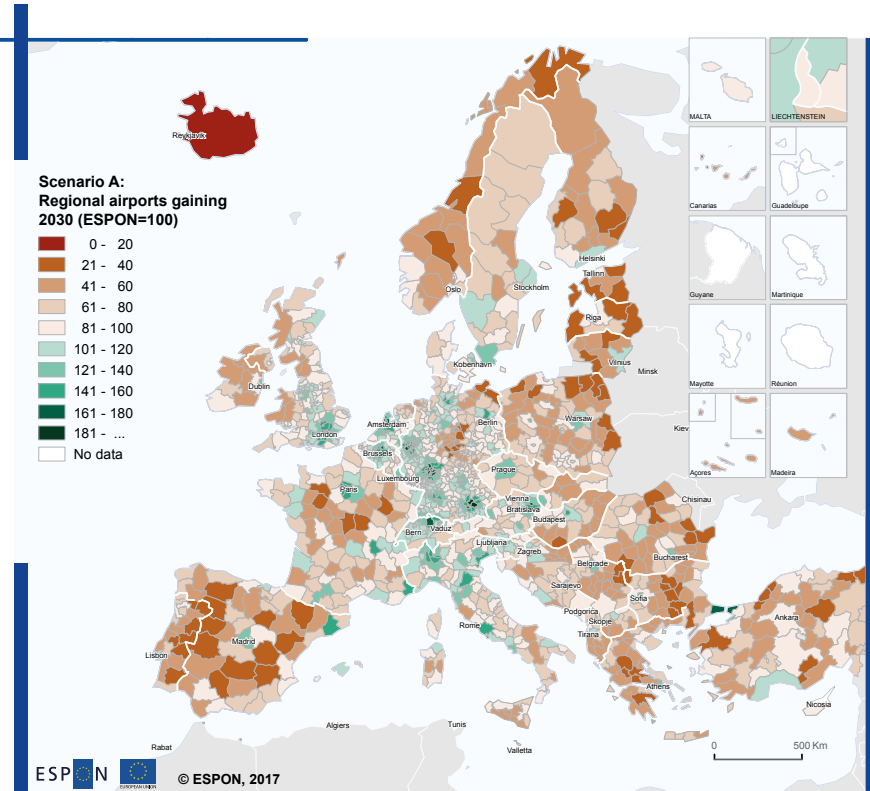
According to scenario A, urban regions will continue to have highest accessibility of around 120 index points compared to the ESPON average, rural areas - the lowest with about 60 index points only. Quite opposite to road and rail accessibility, this distribution of accessibility between these regional types is rather similar in EU15 and EU13. The specific regional types will have much higher accessibility by air compared to the ESPON average than it will be for road and rail. Coastal regions will have an accessibility by air in this scenario which is almost at the average European level, mountain regions will have clearly more than 80 index points. But also islands will be in a comparable good position due to the flight services and will have around 70 index points compared to the ESPON average. Only sparsely populated areas will fall a little bit more behind with around 50 percent of the European average accessibility by air in this scenario by 2030 (maps 3.11 and 3.12).

For scenario B, the overall pattern of regions with highest and lowest accessibility is rather similar to the one of scenario A. The reduction of flights to regional airports leads to a slight increase of the dominance of urban regions (average of 125 index points), whereas rural areas are reducing their relative position in relation to the average. Sparsely populated areas seem to be the regions losing the most in relation to scenario A (7 index points compared to scenario A) (maps 3.13 and 3.14).

Finally, as results of scenario C it is important to emphasize the dominance of urban regions whereas rural areas are reducing their average value. However, islands and sparsely populated areas would even improve their relative position a little if overall flight services in Europe would be reduced (maps 3.15 and 3.16).

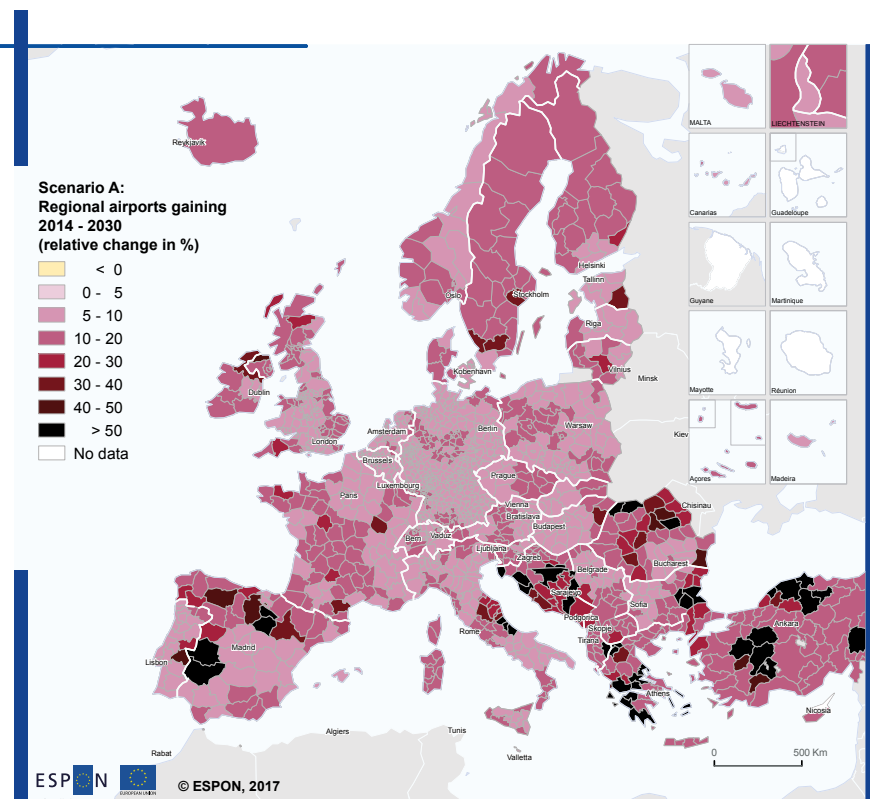
In conclusion, accessibility can be seen as a central location factor, in particular an essential factor for describing the competitive situation of regions in Europe. The accessibility scenarios underline the important role of the TEN-T for territorial development and territorial cohesion. In particular, the foreseen development of the trans-European road, conventional rail and high-speed rail networks will result in higher degrees of cohesion concerning accessibility. However, the overall pattern of potential accessibility is relatively stable due to the distribution of population in Europe. But beyond this overall pattern, the development of the TEN-T will yield a lot of improvements in the regional, national and international connectivity.

Map 3.11: Accessibility potential by air, 2030 (Scenario A)



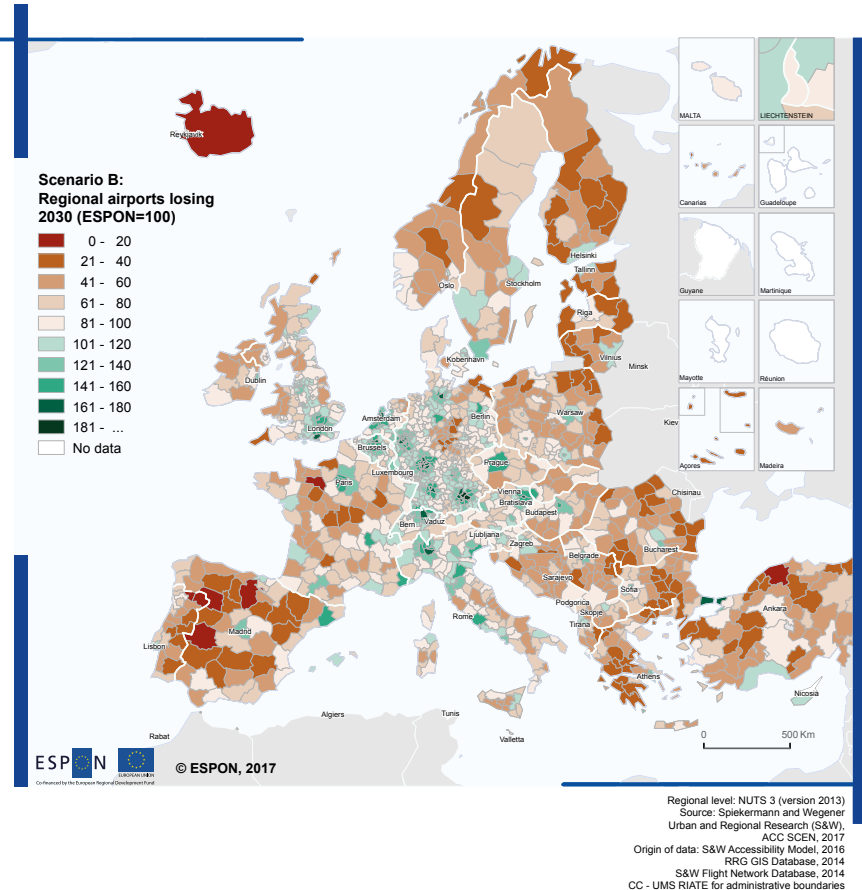
Regional level: NUTS 3 (version 2013)
Source: Spiekermann and Wegener
Urban and Regional Research (S&W),
ACC SCEN, 2017
Origin of data: S&W Accessibility Model, 2016
RRG GIS Database, 2014
S&W Flight Network Database, 2014
CC - UMS RIATE for administrative boundaries

Map 3.12: Changes in accessibility potential by air, 2014-2030 (Scenario A)

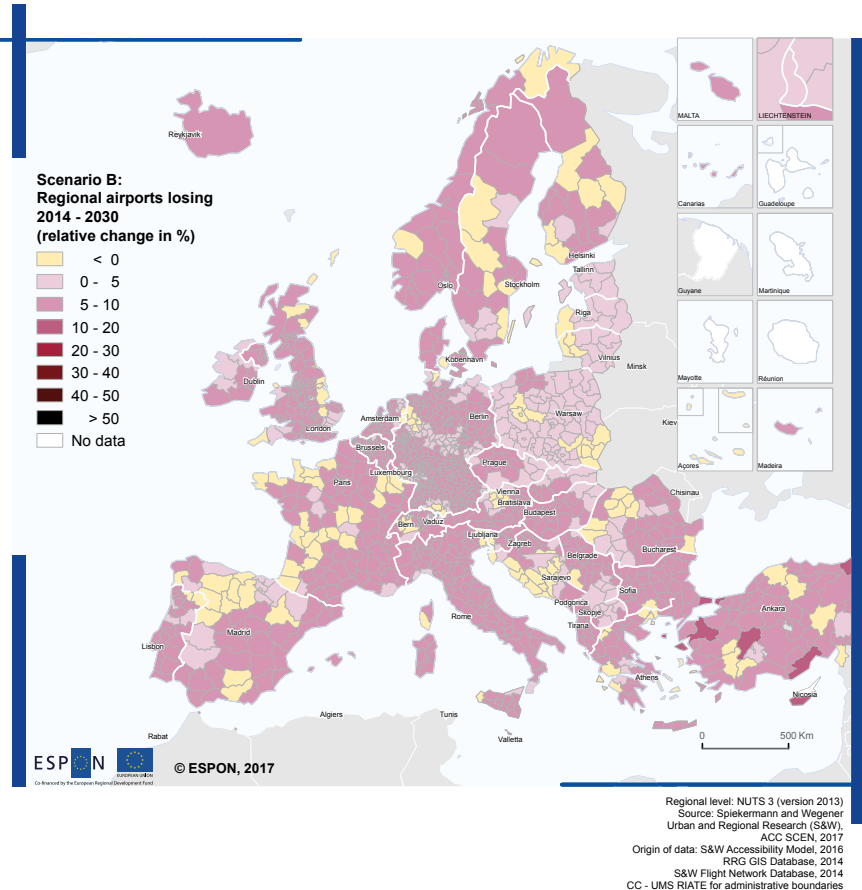


Regional level: NUTS 3 (version 2013)
Source: Spiekermann and Wegener
Urban and Regional Research (S&W),
ACC SCEN, 2017
Origin of data: S&W Accessibility Model, 2016
RRG GIS Database, 2014
S&W Flight Network Database, 2014
CC - UMS RIATE for administrative boundaries

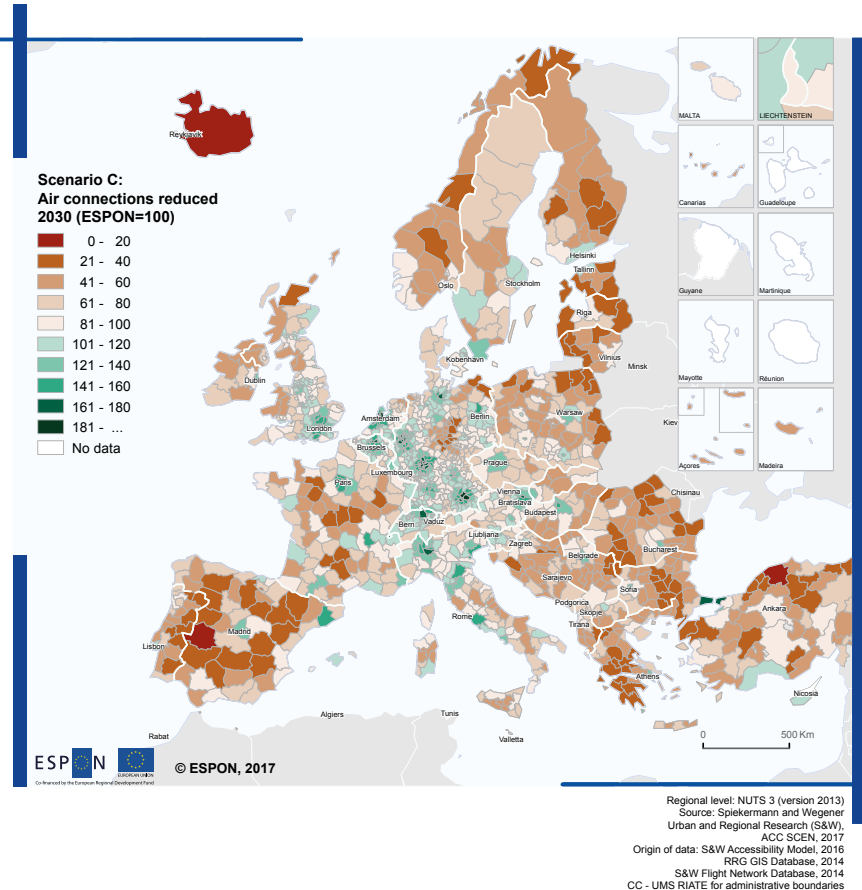
Map 3.13: Accessibility potential by air, 2030 (Scenario B)



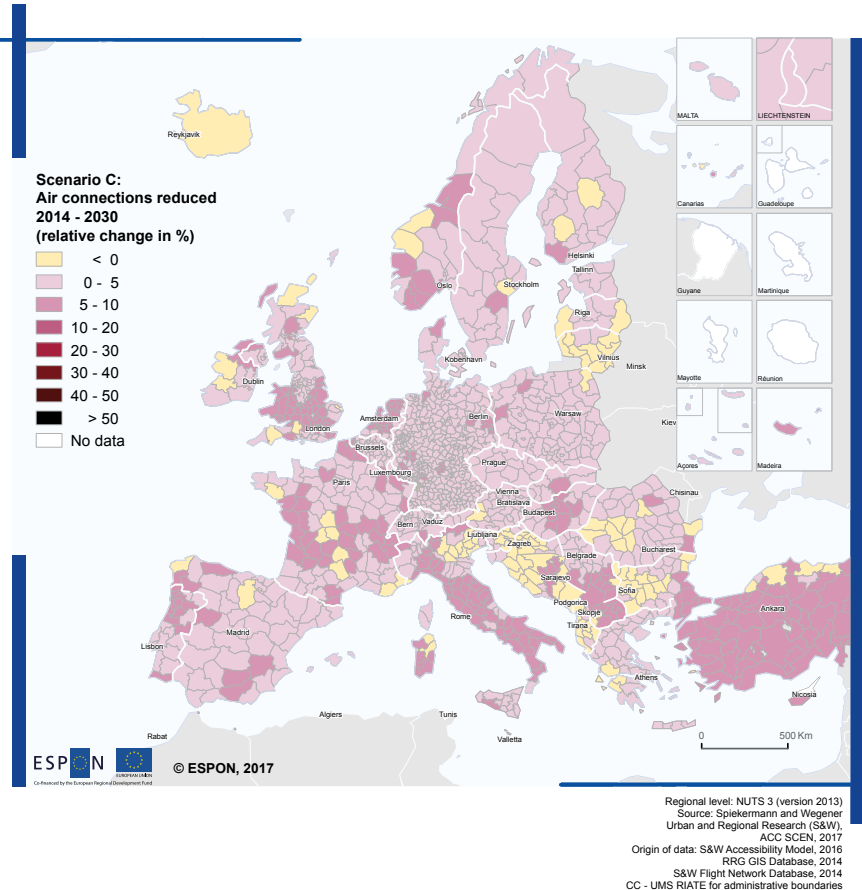
Map 3.14: Changes in potential accessibility by air, 2014-2030 (Scenario B)



Map 3.15: Accessibility potential by air, 2030 (Scenario C)



Map 3.16: Changes in potential accessibility by air, 2014-2030 (Scenario C)



4 Policy considerations in the field of geographic specificities

The Green Paper on Territorial Cohesion³ describes islands, mountains, sparsely populated areas and coastal zones as “regions which face common challenges”, but it does not address policy proposals. Such proposals were formulated in the DG REGIO “Study on the relevance and the effectiveness of ERDF and Cohesion Fund support to Regions with Specific Geographical Features”⁴.

Over the past few years, there have been many initiatives related to specific types of territories at the European Parliament. The February 2016 report “Cohesion in Mountainous Regions of EU”⁵ contributed to preparation and adoption of the European Parliament Resolution “Cohesion Policy in Mountain Regions of the EU on 10th May 2016”. The Rumra intergroup (‘Rural, Mountainous and Remote Areas’) has played a central role in this respect. In parallel, the ‘Seas, Rivers, Islands and Coastal Areas’ Intergroup has organised 13 events on different themes since its first public meeting in March 2015.

Additionally, regional authorities of the Northern Sparsely Populated Areas have requested a territorial review from the OECD. Work on this review is on-going, and results will be published at a launch event on 13th March 2017 in Brussels⁶. It aims to analyse the specific regional challenges and opportunities in terms of long-term growth potential and development.

One can also note that European macro-regional strategies that are organised around seas (Baltic Sea, Adriatic and Ionian Seas) and mountain massifs (Alps) respectively pay specific attention to coastal and mountainous areas.

4.1 Demographic challenges in specific types of territories

Many specific types of territories are confronted with demographic challenges, especially at the sub-regional level (e.g. in remote valleys, small islands, isolated settlements of sparsely populated regions). The first of these is demographic decline. Remote mountain valleys and localities of sparsely populated regions tend to be confronted with particularly rapid population decline. This can also be the case in smaller islands. In many cases, gender imbalances result from the fact that there are fewer employment opportunities for women, who also tend to outperform men when it comes to education and are generally more mobile.

³ European Commission, 2008

⁴ ADE, 2012

⁵ Gløersen, Price, Borec, Dax and Giordano, 2016

⁶ <http://www.northerndimension.info/events/117-oecd-study-of-northern-sparsely-populated-areas-launch>

When population levels fall below critical thresholds for the provision of essential services (e.g. primary schooling, post office, grocery store) and when a local community starts identifying itself as 'unattractive' and 'weak', the spiral of decline can often be difficult to reverse. Controlled depopulation can in some cases be a preferable option, but it is politically difficult to endorse it.

When observing such situations, it can be difficult to determine whether they constitute a natural adaptation to a changing economic and social context, or a threat to sustainable resource exploitation, balanced ecological development, the preservation of biodiversity and of cultural heritage. Only few European countries have a legally or constitutionally established principle of preserving a 'decentralised occupation of the territory' (e.g. Switzerland) or a 'decentralised settlement pattern' (e.g. Norway). There are no general principles for identifying situations calling for pro-active measures to stabilise or increase population levels.

The demographic challenges that some specific types of territories are facing are structural and permanent. Typically, young people have to move to other locations to pursue higher education and only a portion of them move back after graduation.

Particularly attractive islands, coastal areas and mountain resorts can face other types of demographic challenges. These areas attract large numbers of tourists and generate amenity migration. Resulting increases in housing prices can force the local population to settle far from main urban centres where most employment opportunities are found. This might have disruptive effects on local communities, increases daily mobility needs and forces locals to spend a higher proportion of their income on housing and commuting. Additionally, intense demographic growth and seasonal variations in population may put local infrastructure under pressure.

4.2 Economic development

Small islands, remote mountain valleys and isolated communities of sparsely populated regions are normally characterised by low levels of economic diversification. In order to be competitive, they are forced to specialise in only a few sectors of activity. This exposes them to external shocks and limits their resilience. In this context, it seems relevant to focus on 'asset-based' development strategies such as tourism and culture based products. Renewable energy was also identified as an up-coming sector, both as a way of satisfying local energy demand and of developing a niche export industry. Innovation and research and development were, on the other hand, identified as areas in which the challenges to be overcome by specific types of territories are particularly important. However, it is noted that this challenge has been overcome by some northern sparsely populated areas. A model of cooperation between universities/research milieus, industry and government has been

mobilised in this respect⁷. This model has been extended into a so-called 'quadruple helix' model, incorporating the so-called 'third sector' consisting of non-governmental organisations and other non-profit organisations⁸.

The universities/research milieus involved in such 'multiple helix' territorial development models are not necessarily situated within the targeted region or locally, just as involved industrial stakeholders may have their seat in other areas. The smart specialisation approach adopted by the EU which combines industrial, educational and innovation policies seems to be relevant in this context. In particular it is important to select a number of priority areas for knowledge-based investments, focusing on the local assets and comparative advantages.

Furthermore, access to services of high quality is increasingly a precondition to avoid population decline. Pro-active policies to provide access to services of general interest are therefore an important component of economic development policies in specific types of territories.

Considerations above particularly apply to areas where geographic specificities limit population mass and enhance remoteness, e.g. isolated mountain valleys, small islands and towns and villages of sparsely populated regions beyond commuting distance from nearest cities. Preconditions for economic development in major mountain valleys with good accessibility, large and populated islands and capital cities in sparsely populated regions have economic development preconditions that are in most respects similar to those of other regions. Specificities will in this case rather be limited to ecological vulnerability, lack of available land areas and additional costs of exchanges with other territories.

These additional costs may in some instances be quantifiable, e.g. for imports of consumer goods to islands. However, the 'disadvantage' of economic activities situated in specific types of territories cannot generally be quantified. Industries may develop in specific types of territories because they are less sensitive to the constraints linked to this type of geographic location, i.e. that they can be competitive in spite of them or that they can capitalise on assets that compensate for the constraint.

The main objective should be to identify unique opportunities, not to try to make these territories function in the same way as 'mainstream regions'. Such an approach in terms of 'specificity' in no way downplays the extent of challenges to be overcome to achieve economic, social and environmental development in European mountainous, insular and sparsely populated areas, and possible needs for public intervention.

⁷ http://triplehelix.stanford.edu/3helix_concept

⁸ Gløersen, 2009

4.3 Agriculture, forestry and fisheries

Abandoning these activities in specific types of territories can have negative impacts in terms of natural resource exploitation, preservation of landscapes and ecological balance and from a cultural point of view (including preservation of tourism potential). The specific challenges of agriculture in some territories have been addressed by Common Agriculture Policy (CAP) through the definition of 'Less-Favoured Areas' (LFAs) since 1975. In 2013, these areas were renamed 'Areas with natural or other specific constraints'. This new delimitation is based on eight biophysical criteria reflecting factors such as climate, soil productivity and slopes⁹.

A shared challenge in a number of mountainous, insular as sparsely populated areas is small farm size and lower labour productivity. Island fisheries similarly tend to be primarily artisanal. Small size can be compensated for by specialisation in high-added value products, e.g. organic produce, products for niche markets. This in many cases requires vertical integration between groups of farmers or artisanal fisheries, processing plants and commercialisation activities in order to ensure a viable food-production chain. While businesses in "mainstream regions" generally can choose between vertical and horizontal integration (e.g. increase in farm size), vertical integration is in many case the only option in specific types of territories.

Branding and protected designation of origin can constitute powerful levers for the promotion of foodstuffs. Specific types of territories in this respect often have a competitive advantage, as many of them are well-known by the public and can be associated with values such as 'untouched nature' and attractive landscapes. Co-operative structures have successfully been established to capitalise on these assets, e.g. in the case of apple production in the Tyrolian Alps.

A recurring issue in many specific types of territories is that natural resources are exported unprocessed, generating limited added-value. Also in this respect, co-operative structures have proved helpful. For example, the wood processing cluster in Lungau in Salzburg, established at the initiative of the provincial government in 2000, has sought to integrate wood-based value-chains, support marketing initiatives and promote exchanges with other regions. Transfers of good practice can help to diffuse lessons learnt from such initiatives across Europe. The viability of agricultural and fisheries activities can be improved by combining them with other types of activities. Agrotourism and tourism-fishing are well-known examples. There are also examples of innovative initiatives such as the creation of small-scale homes for elderly persons in combination with farming activities. Multi-activity is often the key to economically sustainable development.

Finally, integrated policies to relate agriculture, forestry and fisheries in specific types of territories may also be justified with reference to the 'public goods' or 'ecosystem services' they produce.

⁹ <http://agrienv.jrc.ec.europa.eu/publications/Updated-ANC-biophysical.pdf>

4.4 Transport, accessibility and access to services

When addressing issues of accessibility, a balance needs to be struck between 'hard' infrastructure investments and 'softer' measures to improve cooperation between players of economic development and innovation processes. Infrastructure investments are particularly justified when a 'missing link' or 'capacity bottleneck' is identified as an obstacle to economic development. Furthermore, some upgrades can be of critical importance, typically when it comes to ensuring access broadband. In all such cases, accompanying 'soft' measures are essential to ensure that new possibilities of interaction are transformed into concrete development opportunities.

It needs to be kept in mind that accessibility is the combined result of a transport network and the geographic location of service location points, markets and other facilities or destinations that are considered attractive. Correspondingly, the improvement of accessibility may therefore be approached both from the perspective of investments in transport infrastructure, and of the territorial organisation of e.g. service provision, settlements, natural areas.

Comparisons of levels of accessibility and of their evolution over time, as presented above may be relevant from the perspective of European integration. Accessibility should be analysed and considered in relation to the territorial context and specific needs. The objective for a region is to have access to the transport infrastructure needed to draw benefits from its economic development opportunities. For instance an attractive island region needs airports connecting it to potential tourists, while a sparsely populated region within mines may need train to export ore, and a forested mountain region may need roads to export wood products. More generally, it can be an advantage for business development if day trips to urban centres offering advanced services (e.g. financial services) are possible. However, in many respects, and especially for freight transport, travel times seem of less importance than costs, regularity and reliability of connections. From this perspective, access to alternative modes of transportation when needed (e.g. when extreme weather events occur or in case of damage to essential infrastructure) can be of importance.

A discussion of accessibility in specific types of territories could therefore first relate current accessibility levels (considering different modes of transportation) to existing economic activities and to potential development opportunities. This can lead to the identification of missing links and bottlenecks on which to identify policy measures. Second, possible elements of vulnerability need to be described and analysed. One may consider effects of development such as an increase in energy prices, taxation of greenhouse gas emissions and a changing geopolitical situation. Furthermore, extra-European accessibility is important for a number of specific types of territories on the margins of Europe. Iceland has for example imposed itself as an air hub between Europe and North America. Proximity to Russia and to the Arctic Sea is relevant for Nordic sparsely populated regions. Opportunities deriving from these connections can be incorporated in the analysis.

A future-oriented transport policy needs to take into account emerging trends. One such trend is the growth in the number of independent professionals (or 'iPros'). From 2004 to 2015, their number increased by 55% in the European Union, from 6.2 to 9.6 million¹⁰. Many such 'iPros' have a significant degree of freedom when deciding where to carry out their activities. Specific types of territories may be attractive, at least part of the year, because of the amenities offered (e.g. climate conditions, leisure activities, access to nature).

For this type of development, and an increasingly broad spectre of economic activities, access to high-quality broadband is essential. Providing such access is challenging for a number of specific types of territories. Low population numbers, large distances and challenges linked to the natural environment (e.g. topography, bodies of water) often implies that it is not profitable for private companies to provide broadband to these territories.

4.5 Physical environment

Specific types of territories are defined with reference to physical geography features. The interface between human activities and physical environment will therefore tend to generate specific challenges and opportunities in these territories. These territories also occupy a particular position both in the functioning of European ecosystems and in cultural representations of 'nature' and 'wilderness'. Finally, with the exception sparsely populated areas, specific types of territories are also areas with high levels of biodiversity. As a result, extensive nature protection measures have been implemented in and around mountain areas, islands, sparsely populated areas and coastal regions.

Specific types of territories are also, in different ways, particularly exposed to impacts of climate change. In mountain areas, climate change generates changes in precipitation regimes, by winter snow falls being replaced by rain and by a limitation of land areas experiencing permafrost. This can lead to different effects: more frequent landslides and rock falls; greater variations in river discharge over the year; enhanced risks of draught and floods in downstream areas. Effects of changes in mountain areas can therefore also be felt in lowland areas. Within mountain areas, a number of effects of climate change are already observed: low altitude ski resorts being shut down as a result of insufficient snow cover; ecosystem disturbances such as new pests in forests; biodiversity effects of rising tree lines. Monitoring would help to identify possible needs for preventive and risk management measures.

¹⁰ European Forum for Independent Professionals, 2016; Leighton & Brown, 2013

Islands and coastal areas are particularly exposed to sea level rise, storms, erosion and flooding, especially when they are densely populated. For some southern islands, increasing temperatures may also jeopardise freshwater supply. In sparsely populated areas, specific risks are linked to the traditionally strong role of natural resources and the primary sector in regional economies. Since agriculture and forestry are generally very climate-dependent, such territories are, in principle, more climate-sensitive than regions with a more diversified economic structure.

More generally, economic development strategies could consider specific vulnerabilities of the physical environment in mountain areas, islands and coastal regions. There is extensive evidence on specific processes and risks to be taken into account: buildings and other infrastructure along the coastline can affect coastal erosion; inadequate forestry and agricultural practices generate erosion in mountainous areas; in valleys, diffusion of airborne pollutants can, depending on weather conditions, be limited by surrounding mountain.

5 Policy options: need to focus on the specific development opportunities

Patterns of development in specific types of territories, as presented in previous sections, are diverse in Europe. Making Europe more cohesive, resilient and prosperous requires that one fully acknowledges the diversity of European territories, their development preconditions and objectives.

From a territorial cohesion perspective, it is important to take challenges and opportunities of inhabitants of specific types of territories into account, even when they only total a small proportion of the European population. Populations of small islands, isolated valleys and sparsely populated communities beyond commuting distance from larger towns or cities can play an important role in the exploitation of territorial resources and the preservation of biodiversity. The alternative scenario, i.e. a depopulation of such 'atypical territories', is largely rejected by public opinions across Europe.

Regions cannot be compared against the same benchmarks because different types of regional specialisations create different levels of economic return. Understanding specific processes to inform policy-making is more important than benchmarking and the focus should be on potentials rather than on relative performance of different places.

Different aspects can be considered for each category of geographic specificity. However, small and isolated settlements in many respects face similar challenges, irrespective of whether they are mountainous, insular or located in a sparsely populated area. Issues related to maintaining high quality transport connections between specific types of territories, the rest of Europe and other parts of the world are also in many respects analogous.

Many of the specificities in the present publication relate more particularly to situations of low demographic and economic mass and remoteness, e.g. found in small islands, remote valleys, and isolated communities of sparsely populated areas. Topography, bodies of water and geographic distance creates acute situations of remoteness. This generates environments where the provision of services is more costly, and where labour market tends to be less diversified. Higher service costs limit the range of available services, while insufficiently diverse labour markets tend to be less resilient in the face of external shocks.

Numerous development opportunities in specific types of territories are identified, but are not taken full advantage of because of limiting factors such as insufficient access to services of general interest, difficulties attracting employees with adequate competences and limited connections to relevant research and development milieus. The focus is therefore on different types of 'market failures' that prevent Europe from taking full advantage of the human and natural capital of specific types of territories.

An integrated place-based approach is needed since geographic specificity is only one of many factors (e.g. national context and policy) influencing the performance of any given territory. Therefore, EU and national policy frameworks should support the development and implementation of integrated and place-based development strategies of cities and regions, aimed at tackling their specific development challenges and strengthening their unique potentials. There is no need to develop a policy “per geographic specificity” and this would not even be possible considering the wide divergence of development trends within each group and overlap of “geographic specificities”. Supporting integrated asset-based development strategies that respect territorial challenges and opportunities is more worth consider as a strategic approach.

These territories can be effectively targeted through an integrated strategy that takes account of both their natural and structural handicaps (remoteness and sparsity) and their unique assets (especially their natural and cultural resources), reveals their development potentials (in tourism, renewable energy etc.) supports innovative cross-sectoral developments (e.g. agrotourism and fishing tourism) and actively promotes functional links and territorial co-operation with surrounding areas.

A wide range of measures based on a more functional and a policy-based approach can be envisaged by national governments, regions and cities to improve the development perspectives in specific types of territories such as inter-sectoral dialogue. Other possible fields of action can include the diversification of employment opportunities, overcoming physical remoteness by developing new ICT solutions, investing in alternative energy sources, encouraging young people to return after university studies, developing niche products (e.g. aquaculture specialised in seed mussels), branding local products.

It is of key importance for specific types of territories to take better account of externalities. This type of approach is relevant from a number of different perspectives: the additional costs of delivering high quality public transportation and increasing accessibility in remote communities of sparsely populated and mountainous regions, as well as to and from islands, need to be weighed against development opportunities that may otherwise be lost. Tourism development in islands and mountain regions needs to take better account of ecological vulnerabilities. The roles of agriculture, forestry and fisheries in preserving local identities, biodiversity and landscapes need to be considered. Public goods and ecosystem services are important elements for specific types of territories. This implies that the elaboration and implementation of place-based approaches and local development strategies involve a number of sectors such as agriculture, environment, education, energy and transport.

There are plenty of possible policy measures; the key is to ensure that they are adequately tailored to local potentials and challenges.

Annex: methodological notes

A. Categories of specific types of territories

The present note describes how each type of geographic specificity (insularity, mountainousness, demographic sparsity and coastal situation) may affect socio-economic development levels and perspectives.

Islands

Insularity corresponds to a situation of isolation and relative inaccessibility of a place surrounded by sea. Some main parameters need be taken into account when considering the implications of such a situation:

- Institutional status: islands can be sovereign states, regions with a variable degree of autonomy, municipalities (or groups of municipalities) or parts of municipalities. The 'mainland' to which each island relates is specific to each of these situations, as it will respectively be the European continent, the rest of the national territory or the mainland component of the municipality.
- Size of islands: Island populations vary from 6.4 million in Ireland and 5 million in Sicily down to just a few inhabitants. In relation to islands there is also a large diversity across ESPON space. The socio-economic meaning of 'insularity' is profoundly different in these different situations.
- Population density: some islands and archipelagos have low population densities (e.g. Saaremaa (11.6 inh./km²), Shetland islands (15.9 inh./km²) and Åland (18.3 inh./km²)), while others are densely populated (e.g. Malta (1,358 inh./km²)). In islands belonging to the latter group, land use pressures and conflicts between different types of land use tend to be more pronounced than in mainland regions with similar population densities, as there are no surrounding areas than can function as "buffers".
- Distance to mainland: Some islands are located close to a mainland with which it is connected by regular ferry connections; others are remote and connections to the mainland may be irregular and costly. Territories with fixed connections to the mainland tend to be eliminated from the 'island' category. However, it is discussed whether a fixed link overcomes insularity. First, tolls on a fixed link may create a significant barrier to exchanges. Second, a fixed link does not need to imply that an island becomes as accessible as a mainland territory. For example, a bridge over the strait of Messina is likely to affect Sicily's insularity only in selected respects.

Situations such as double insularity (an island of which the mainland is itself an island, e.g. Gozo in relation to Malta) and archipelagos have specific socio-economic implications. Outermost regions are, in a number of respects, different from 'continental islands': their 'geographical' mainland in many cases differs from their 'institutional' mainland (e.g. respectively Venezuela and continental Europe for Guadeloupe and Martinique), their bio-

geographical conditions are different from continental Europe and their colonial history extensively impacts demographic and economic patterns.

One can identify 31 island and island regions in Europe. Three different types of situations occur: islands composed of a single NUTS3 region, islands composed of multiple NUTS3 regions, NUTS3 regions composed of multiple islands ("archipelago region"). In total, 72 NUTS3 regions are insular. 13 out of these are Outermost regions.

Accessibility is a shared constrain for all islands. Islands are generally dependent on sea and air connections for communications with outside territories. Energy provision is also in many cases difficult: islands are often not connected to mainland electricity grids, and their fossil energy provision can be more costly. Islands are also, as coastal regions, particularly exposed to extreme weather events, rising sea levels and erosion. Other constrains are specific to some types of islands: in some small densely populated islands, negative impacts of land development may be an issue; for islands with a low population, the range of available services may be limited.

Mountains

Mountain regions are territories with constrains linked to topography. These constrains are of two types: high altitudes and rough terrain. At low altitudes, terrain needs to be particularly rough for an area to be considered mountainous (e.g. fjord landscapes, Mediterranean dry mountains ending as sea cliffs); at high altitudes (above 2,500 m), all areas are considered mountainous. In addition, topographic constrains must be continuous over a relatively large area for a territory to be considered as 'mountainous'. ESPON¹¹ for this reason excluded areas of less than 100 km² (considered as 'exclaves'). Inversely, non-mountainous areas of less than 100 km² surrounded by mountainous area (so-called 'enclaves') were assimilated to mountain areas.

A mountain area relates to a surrounding lowland. A number of large metropolitan areas are located close to mountain areas, e.g. around the Alpine massif. Mountains are sources of significant resources, e.g. water, energy, forests and leisure areas, which have historically favoured development in surrounding lowland areas. There can also be conflicts between mountain areas and surrounding lowlands, e.g. with regards to ownership and use of resources (e.g. water) and nature protection vs. exploitation.

Mountain areas often function as borders between nation states and regions. In these cases, cross-border coordination may be needed for their management. Mountain areas are usually grouped according to ranges (or 'massifs'), i.e. areas with geologically related mountains. This is meaningful also from a socio-economic perspective because different mountain shapes generate different types of constrains and because delineations of massifs are deeply embedded in national and regional cultures.

¹¹ GEOSPECS project
https://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/geospecs.html

One of the characteristic features of mountain areas are strong local gradients, e.g. between valleys and slope parts, and between urban and rural areas. These contrasts have tended to increase strongly over the last decades, e.g. as a result of rural out-migration, mechanisation of forestry and agriculture and of growth in tourism in selected areas.

ESPON¹² identified 15 transnational mountain ranges in EU 27+CH+IS+LI+NO, including five groupings of islands spread over one or more different island territories: Icelandic mountains, mountains of the British Isles, Mediterranean island mountains, Caribbean island mountains and Indian Ocean Island mountains (La Réunion). 363 NUTS3 regions are identified as mountainous.

Sparsely populated areas

Sparsity was introduced as a European geographic specificity as part of the EU accession negotiations of Finland, Norway and Sweden. These countries had traditionally approached their northern peripheries as sparsely populated, and wished to pursue policies giving these territories special treatment after EU accession. Since then, other territories, notably in Spain, have also started identifying themselves as sparse.

Low population density is commonly considered as the defining feature of sparsely populated areas. The threshold used in EU cohesion policy, and applied in the present study, is 12.5 inh./km² at NUTS3 level. However, this raises some challenges to identify areas with scattered settlement patterns. First, NUTS3 regions may fall above this threshold even if they include extensive sparsely populated areas if their regional centre has a large population; inversely, territories around the main centre of population of a NUTS3 region defined as sparsely populated may develop as any in any other urbanised area. Second, the ways in which borders between NUTS3 regions are drawn heavily influence which areas are identified as sparsely populated.

As an alternative, the ESPON¹³ suggested to approach sparsely populated areas on the basis of population potentials, i.e. the total number of persons that can be reached either within an Euclidian distance (e.g. 50 km) or a time-distance (e.g. 45 minutes). This approach better reflects the challenge sparsely populated areas are confronted to, which is linked to the total population within daily mobility distance, rather than to the number of persons per unit of land area. The lack of demographic and economic mass impacts the range of available services, the diversity of the local economy. It on the other hand generates opportunities linked to the attractiveness of untouched nature for tourists. Many sparsely populated areas can in addition boast natural resources such as forests, ores or access to fishing areas, of which the economic value is especially significant when compared to their population.

¹² GEOSPECS project
https://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/geospecs.html

¹³ GEOSPECS project
https://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/geospecs.html

In the EU28+CH+IS+LI+NO, 34 NUTS3 regions are currently identified as sparsely populated. 23 of these are in the Nordic countries (Finland, Iceland, Norway and Sweden), 5 in Scotland and 1 in Estonia. In southern Europe, one can find 3 sparsely populated regions in Spain, 1 in Greece and 1 in Croatia. In addition, the French Outermost region of Guyana is also sparsely populated.

Coastal regions

Coastal NUTS3 regions are defined as regions where at least 50% of the population lives within 50 km of the coast. They are in some respects comparable to border regions, as they form so-called half-circle economies along the coastline, but can also function as interfaces with other territories to which they may be connected by port infrastructure. In addition, coastal territories may be confronted to coastal erosion phenomena, and are particularly exposed to risks of flooding and other extreme weather events.

Coastal areas concentrate diverse activities: they can be fishing grounds, focal points for trade and transport, recreational spaces and habitats for a number of species. In addition, ports and their hinterlands have historically attracted a number of economic activities and a large population. These different functions generate land use conflicts and the need for policies that for example concern water management, pollution, bathing water quality, conservation, alien species, climate adaptation, floods and erosion. As illustrated by the Baltic macro-regional strategy's dealing with the issue of eutrophication, and ensuing algae blooms, coastal issues can require integrated actions in an area that is much larger than individual coastal regions. A number of regions belonging to the basins of rivers throwing themselves into the Baltic Sea need to be mobilised, in addition to riparian regions. Coastal Zones Management (ICZM) and Maritime Spatial Planning (MSP) require coordination across administrative boundaries and sectors. In the EU28+CH+IS+LI+NO 488 NUTS3 regions are identified as coastal.

B. Scales of analysis

In order to make it possible to interpret results of an analysis of socio-economic effects of insularity, mountainousness, demographic sparsity and of a coastal situation at the NUTS3 level, this section describes possible biases resulting from this level of analysis. Analyses are based on a comparison of delineations at LAU2 level previously produced by the ESPON¹⁴ and of the NUTS3 typology currently applied by the European Commission, DG REGIO.

Islands

ESPON identified 240 islands at the LAU2 level (i.e. excluding islands that are sub-units of municipalities). This can be compared to the 31 islands at the NUTS 3 level described above. These 31 island regions concentrate 97.8% of Europe's island population, while the 209 other islands only total 2.2%. However, the proportion of population in sub-NUTS3 islands is more significant in some countries, e.g. Finland, Denmark and Sweden (see table 5.1).

Table 5.1: Population in island LAU2 units and in island NUTS3 units, by country

	<i>Island LAU2 in non-insular NUTS 3 region</i>	<i>% of ins.r population</i>	<i>Island LAU2 in insular NUTS 3 region</i>	<i>% of ins.r population</i>	<i>% total population</i>
	<i>Population (2011)</i>		<i>Population (2011)</i>		
CY	–	–	826 842	100.0%	100.0%
DE	31 146	100.0%	–	–	0.0%
DK	9 047	17.8%	41 896	82.2%	0.9%
EE	41 030	100.0%	–	–	3.2%
ES	–	–	3 119 607	100.0%	6.7%
FI	16 505	37.1%	28 007	62.9%	0.8%
FR	15 711	0.8%	1 986 572	99.2%	3.1%
GR	80 885	5.3%	1 443 499	94.7%	13.9%
HR	78 649	100.0%	–	0.0%	1.8%
IE	–	–	4 555 978	100.0%	100.0%
IS	–	–	318 452	100.0%	100.0%
IT	121 618	1.8%	6 637 514	98.2%	11.4%
MT	–	–	414 250	100.0%	100.0%
NL	24 060	100.0%	–	–	0.1%
NO	46 729	100.0%	–	–	0.9%
PT	–	–	513 882	100.0%	4.9%
SE	12 449	17.9%	57 269	82.1%	0.7%
UK	23 604	1.2%	1 931 475	98.8%	3.3%
ESPON space	501 433	2.2%	21 875 243	97.8%	4.3%

¹⁴ GEOSPECS project

https://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/geospecs.html

Table 5.2: Population in islands by administrative levels at which insularity occurs, as proportion of total national population

	LAU2	NUTS3*	NUTS2/1	Island state	Total island population
CY	–	–	–	100.0%	100.0%
DE	0.04%	–	–	–	0.04%
DK	0.2%	0.8%	–	–	0.9%
EE	3.2%	–	–	–	3.2%
ES	–	–	6.7%	–	6.7%
FI	0.3%	–	0.5%	–	0.8%
FR	0.02%	0.1%	3.0%	–	3.1%
GR	0.5%	–	13.2%	–	13.7%
HR	1.8%	–	–	–	1.8%
IE	–	–	–	100.0%	100.0%
IS	–	–	–	100.0%	100.0%
IT	0.2%	–	11.2%	–	11.4%
MT	–	–	–	100.0%	100.0%
NL	0.1%	–	–	–	0.1%
NO	0.9%	–	–	–	0.9%
PT	–	–	4.9%	–	4.9%
SE	0.1%	0.6%	–	–	0.7%
UK	0.04%	0.3%	2.9%	–	3.3%
ESPON space	0.1%	0.1%	3.0%	1.2%	4.3%

As specified above the institutional level at which insularity occurs is important to consider. Europe includes island states (Cyprus, Iceland, Ireland and Malta). Greece and Italy stand out with an island population corresponding to over 10% of the total national population. This island population is primarily or exclusively located in NUTS2 or NUTS1-level islands. Spain and Portugal have between 4.9% and 6.7% island population, followed by France at 3.1% (with Corsica and insular outermost regions), the UK with 3.3% (Northern Ireland and the Isle of Wight, mainly) and Finland (0.5% of the population living in the autonomous island region of Åland). In countries with only islands municipalities, their population total 3.3% of the population in Estonia, followed by Croatia (1.8%) and Norway (0.9%).

Island population outside of island regions is therefore a small proportion of the total population in most countries. From a territorial cohesion perspective, human presence on small islands can be strategically important insofar as it makes the use of their resources possible.

Mountains

The relationship between mountain and neighbouring lowland areas is an essential component of the development of Europe's mountain. While measures to promote development in mountain areas therefore need to consider their wider functional context, it is from an analytically perspective interesting to separate mountains and lowland. This makes it possible to better identify their respective patterns and trends.

Mountain regions identified at the NUTS3 level makes this distinction between mountain areas and their piedmonts difficult (table 5.3). 41.8% of the population in mountainous NUTS 3 regions live in non-mountainous LAU2 units. This corresponds to 54 million persons, out of the 130 million inhabitants of mountain NUTS 3 regions.

In addition, 18.6% of the population in non-mountainous NUTS 3 regions live in a mountainous LAU2 unit. The total population of these municipalities is 17 million inhabitants. This population is then not considered to be mountainous in a NUTS3-level analysis.

Table 5.3: Mountain population in LAU2 units within 45 minutes of coast and in coastal NUTS3 units

	Non-mountain LAU2	Mountain LAU	Total
Non-mountain NUTS 3 regions	367 197 829	17 289 924	384 487 753
Mountain NUTS 3 regions	54 373 998	75 659 969	130 033 966
Total	421 571 827	92 949 893	514 521 719

The bias resulting from a NUTS3-based approach of mountain areas varies considerably between mountain massifs. Outermost mountain areas of the Caribbean and of Réunion are entirely ignored at the NUTS3 level, and over 50% of the population of mountainous municipalities the British Isles is located in regions identified as lowland. At the other end of the scale, over 90% of the mountain population is included in mountain NUTS3 in the Alps, Balkans, Nordic countries and Atlantic Islands (table 5.4). However, a significant proportion of population in non-mountainous LAU2 may nonetheless be included in the NUTS3 regions identified as mountainous in these areas.

Table 5.4: Population within and outside mountain NUTS3 regions by massif

Transnational mountain massif	Total population	Population living			
		outside a mountainous NUTS3 region	%	within a mountainous NUTS3 region	%
Alps	15 694 566	1 526 658	9,7%	14 167 908	90,3%
Apennines	9 573 834	1 722 189	18,0%	7 851 645	82,0%
Atlantic Islands mountains	2 260 508	42 367	1,9%	2 218 141	98,1%
Balkans/Southeast Europe	9 790 244	921 713	9,4%	8 868 532	90,6%
British Isles	2 014 203	1 055 070	52,4%	959 133	47,6%
Caribbean Island mountains	247 346	247 346	100,0%	–	–
Carpathians	10 307 305	1 689 494	16,4%	8 617 811	83,6%
Central Europ. Middle mountains	16 300 023	5 510 554	33,8%	10 789 469	66,2%
Iberian mountains	12 321 566	2 187 150	17,8%	10 134 416	82,2%
Iceland	65 384	–	–	65 384	100 %
Indian Ocean Island mountains	832 872	832 872	100,0%	–	–
Massif central	2 696 744	452 736	16,8%	2 244 008	83,2%
Mediterranean island mountains	5 081 216	717 700	14,1%	4 363 516	85,9%
Nordic	2 868 912	253 723	8,8%	2 615 189	91,2%
Pyrenees	2 895 168	130 353	4,5%	2 764 816	95,5%

Sparsely populated areas

Table 5.5 compares the population living in municipalities from which more or less than 100,000 persons can be reached within 45 minutes by road, and the population living in regions identified as sparsely populated using the population density threshold of 12.5 inhabitants/km². This shows that 2,2 million inhabitants of NUTS 3 classified as sparsely populated in fact live in an area where more than 100,000 persons can be reached within 45 minutes. This corresponds to 46.1% of the total population of sparsely populated NUTS3. In addition, close to 2.3 million inhabitants living in LAU2 where less than 100,000 persons can be reached within 45 minutes are not included in sparsely populated NUTS 3 regions. This is 46.6% of the population identified as living in a sparsely populated LAU2 unit.

In other words, close of half of the population living in NUTS3 regions identified as 'sparse' are in fact not confronted to sparsity in their daily lives, and close to half the population confronted to this challenge are disregarded in analyses at the NUTS3 level.

Table 5.5: Population in LAU2 units from which less than 100,000 persons can be reached within 45 minutes and in sparsely populated NUTS3 units

	Non-sparse LAU2	Sparse LAU2	Total
Non-sparse NUTS 3 regions	507 400 608	2 281 104	509 681 712
Sparse NUTS 3 regions	2 233 355	2 606 652	4 840 007
Total	509 633 964	4 887 756	514 521 719

Coastal regions

Table 5.6 compares the population living in municipalities within 45 minutes from the coastline, and the population living in regions identified as coastal based on the criterion that 50% of its population is within 50 km of the coastline. It shows that 26 million inhabitants of coastal NUTS 3 is fact live beyond 45 minutes of the coast. This is 12.9% of the total population of coastal NUTS3. In addition, close to 8.5 million inhabitants living in LAU2 within 45 minutes from the coast are not included in coastal NUTS 3 regions.

Table 5.6: Population in LAU2 units within 45 minutes of coast and in coastal NUTS3 units

	Non-coastal LAU2	Coastal LAU2	Total
Non-coastal NUTS 3 regions	300 878 113	8 472 692	309 350 805
Coastal NUTS 3 regions	26 540 446	178 630 468	205 170 915
Total	327 418 559	187 103 160	514 521 719

C. Ferry Networks and Hinterland Accessibility

Ferry Networks. The indicator addressing the ferry network (maps 3.2 and 3.3) is based on the collection of ferry network information from various sources. The data was collected by analysing information provided by ports, ferry operators and tour agents on the internet in form of time table information and ferry connections on maps. The information on the ferry networks of the European seas was collected by systematically checking those websites. Information has been stored in an appropriate database.

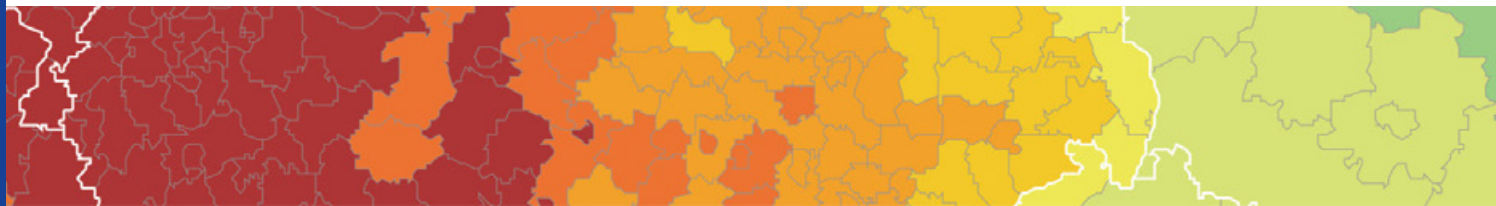
Hinterland accessibility. This type of indicator can not be directly based on empirical data, but requires the application of an appropriate accessibility model. The indicator reflects the hinterland of ports, i.e. land market area, due to the integration of the ports in the land-based networks connecting the hinterland with the ports. For calculating this indicator, S&W's accessibility model for road¹⁵ was modified in a way that it calculates for each port the travel time to all NUTS-3 regions in Europe and then sums up the population that is reachable within the maximum travel time.

The accessibility model takes into account the risk of congestion and adds additional travel time at the end of the trip because NUTS-3 regions are modelled as points and the population of the whole region should be reached. Therefore, the numbers shown in map 3.6 should be interpreted as the minimum amount of population reachable within 4 hours.

¹⁵ TRACC project
https://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/tracc.html

References

- ADE (2012) Study on the relevance and the effectiveness of ERDF and Cohesion Fund support to Regions with Specific Geographical Features – Islands, Mountainous and Sparsely Populated areas. Louvain-la-Neuve: European Commission.
- Baird AJ and Wilmsmeier G (2011) Public tendering of ferry services in Europe. *European Transport / Trasporti Europei* (49): 90–111.
- Davies R (2016) Broadband as a universal service. Briefing, European Parliamentary Research Service.
- Department for Culture, Media & Sport (2015) Government plans to make sure no-one is left behind on broadband access. Available at: <https://www.gov.uk/government/news/government-plans-to-make-sure-no-one-is-left-behind-on-broadband-access> (accessed 6 January 2017).
- ESPON (2012) European Perspective on Specific Types of Territories (GEOSPECS). Available at: https://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/geospe.html
- ESPON (2015) Transport Accessibility at Regional/Local Scale and Patterns in Europe (TRACC). Available at: https://www.espon.eu/main/Menu_Projects/Menu_ESPON2013Projects/Menu_AppliedResearch/tracc.html
- EDRi (2009) Finland: Introducing Internet broadband as a universal service. Available at: <https://edri.org/edrogramnumber7-20finland-broadband-internet-universal-access/>
- European Commission (2008) Green Paper on Territorial Cohesion – Turning territorial diversity into strength, Communication from the Commission to the Council, the European Parliament, the Committee of the Regions and the European Economic and Social Committee, COM(2008) 616 final, 6.10.2008.
- European Forum for Independent Professionals (2016) Independent professionals driving Europe's employment revolution | efip.org. Press release. Available at: <http://www.efip.org/node/21> (accessed 6 January 2017).
- Gløersen E (2009) Strong, Specific and Promising - Towards a Vision for the Northern Sparsely Populated Areas in 2020. Stockholm: Nordregio.
- Gløersen E, Price MF, Dax T, et al. (2016) Cohesion in Mountainous Regions of the EU. Brussels: European Parliament - Committee on Regional Development.
- ITU News (2010) Broadband now a legal right in Finland. Available at: <http://www.itu.int/net/itunews/issues/2010/06/34.aspx>.
- Kluge L and Spiekermann K (2016) Scenarios for accessibility by the sea, road, rail, air and multimodal. ESPON & Spiekermann & Wegener, Urban and Regional Research (S&W).
- Leighton P and Brown D (2013) Future Working: The Rise of Europe's Independent Professionals (iPros). European Forum of Independent Professionals. Available at: <http://www.efip.org/future-working-the-rise-of-europeans-independent-professionals/>.
- Ministry of Transport and Communications (2015) Broadband. Available at: <http://www.lvm.fi/en/broadband>.
- Monfort P (2009) Territories with specific geographical features. *Regional Policy* 2/2009.
- Spiekermann K and Schürmann C (2014) Update of maps: Travel time matrices on road, rail, air and multimodal for 2001, 2006, 2011 and 2014. ESPON.



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