ESPON

EUROPEAN UNION

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Inspire Policy Making with Territorial Evidence

Territorial fiche

Territorial patterns and relations in Germany

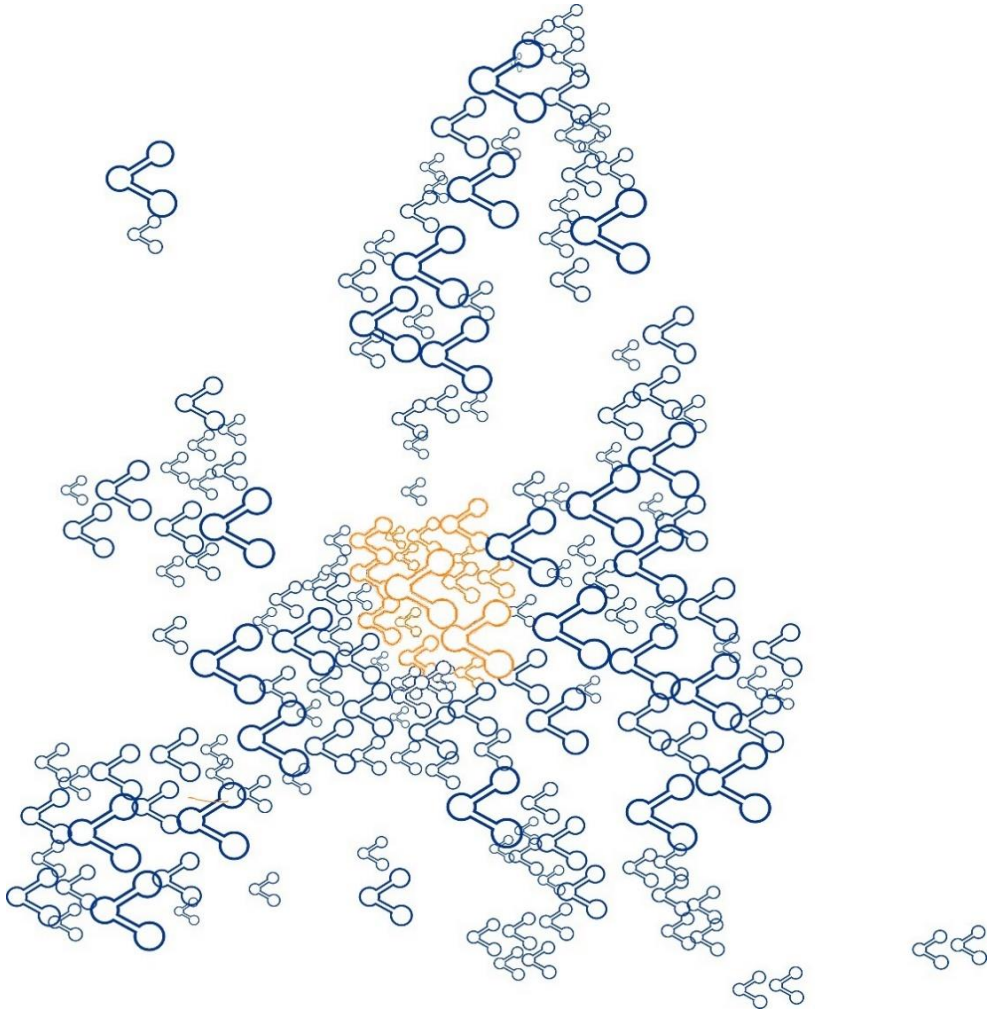
Social

Urbanisation

Economy

Accessibility and Transport

Environment



Interactive version: www.espon.eu/germany

Introductory remarks

The content of the following overview is a summary of research results from different thematic applied research projects under the ESPON 2020 programme. As a consequence, most indicators and analyses are not based on most recent data but represent the data availability at the time when the research was undertaken. Only in a few cases, for some rather basic indicators that could easily be reproduced, more up-to-date information was used.

It is therefore important to note that this overview is mainly a collection of available findings with different time stamps and not an up-to-date, comprehensive analysis. Its main goal is to showcase the wide range of ESPON research and, by zooming-in on a specific country, to raise interest for the scientific results at a more national and even regional scale.

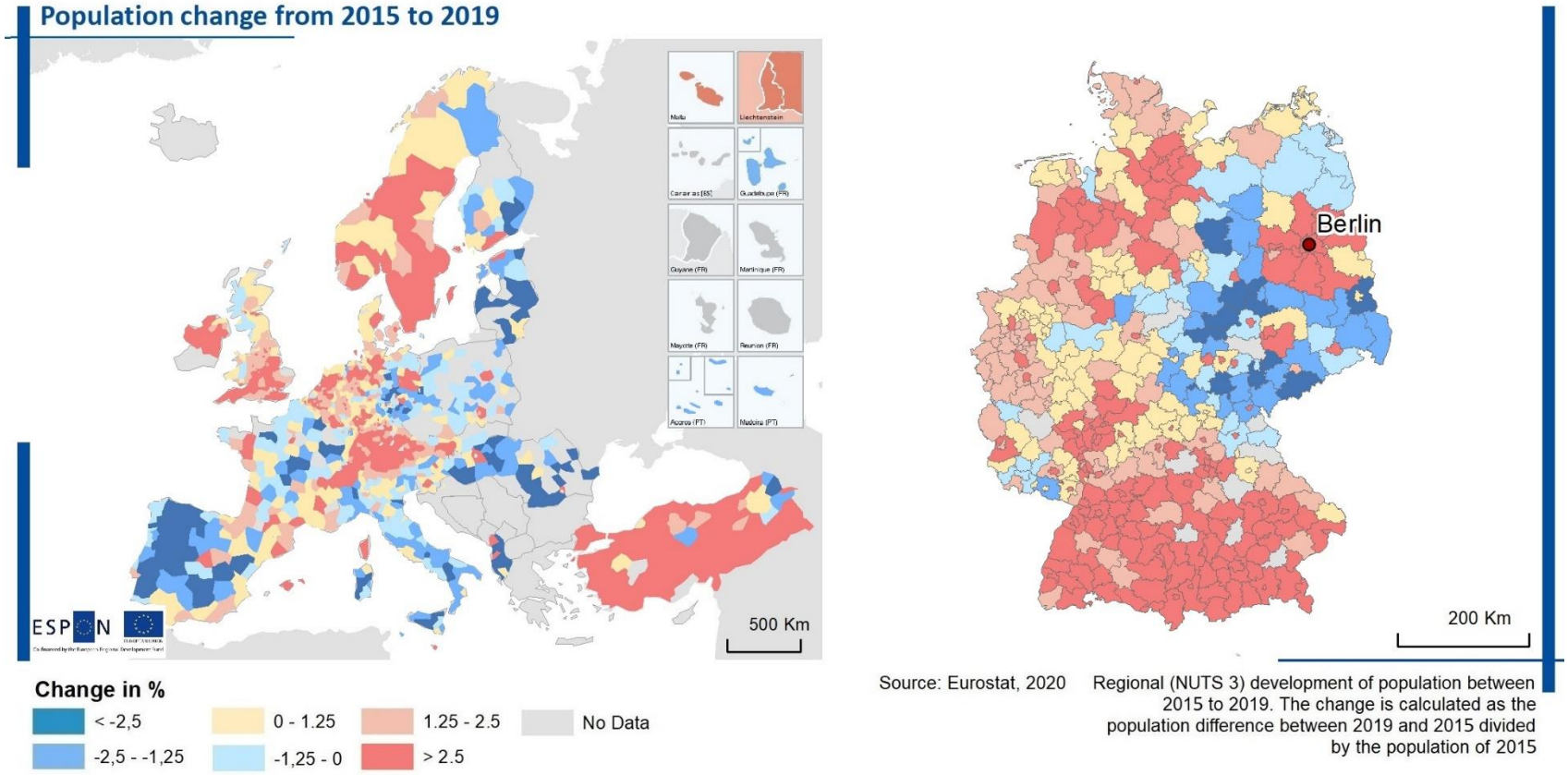
Social

Demographic changes

Age index of population

In general, Germany has a West-East divide in population development, with increasing populations in most of the western regions, including both cities and rural regions. The East has more distinct spikes of population increase in cities and their nearest surroundings. Shrinking populations characterise East-German regions (outside of city regions) and in structurally less-favoured areas in the West.

Almost all German regions have populations that are among the oldest in Europe. In the eastern parts of Germany there is a ratio of more than two elderly people come to one child. Even regions with a low age index value in the Germany are comparable to distinct above-average regions of other European countries.



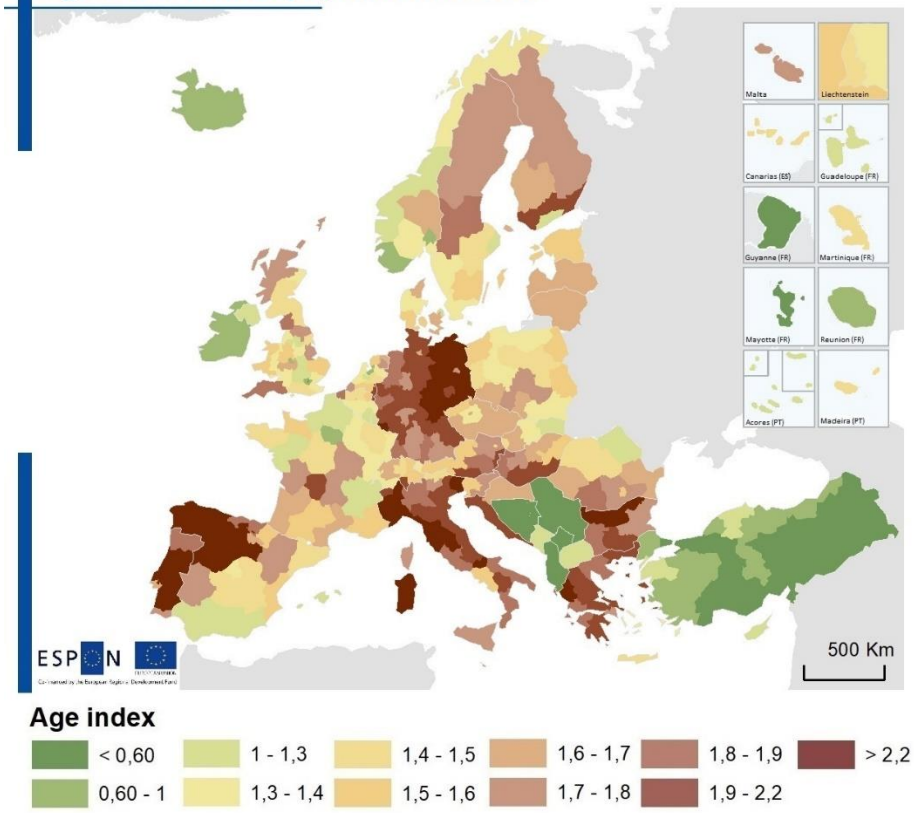
Source: Eurostat, 2020

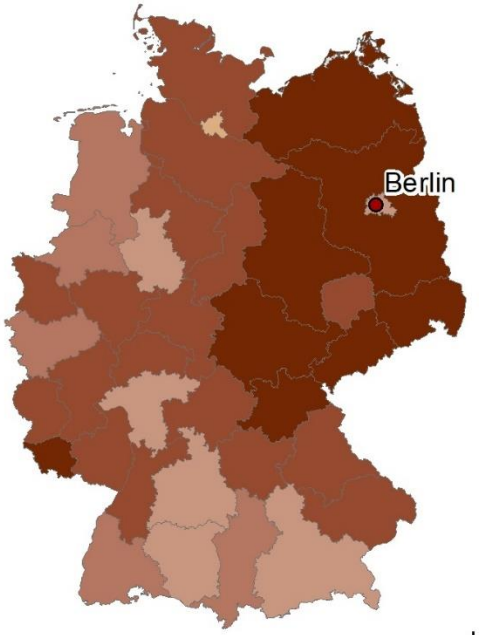
Regional (NUTS 3) development of population between 2015 to 2019. The change is calculated as the population difference between 2019 and 2015 divided by the population of 2015

Despite the lack of data for some of the NUTS regions, a few trends can be observed. Large portions of Eastern Europe, Italy, Spain and France have a decreasing population. For the latter two, however, a population increase can be observed in urban areas such as Madrid, Barcelona, Bordeaux, Nantes or Paris. Other regions such as the Lowlands, western Germany, the UK and Ireland are also characterised by an increasing population. These trends are significantly influenced by the job opportunities and the economic situation of the regions.

In general, Germany has a West-East divide in terms of population development, with increasing populations in most western regions, both in cities and rural regions. The East has more distinct spikes of population increase in cities and their nearest surroundings. The southern regions show the strongest increase. North-western areas and coastal regions, both North Sea and Baltic Sea, also show population increase but to a lower extent and concentrated in only a few regions. Shrinking populations characterise East-German regions (outside of city regions) and in the structurally less-favoured areas in the West.

Age index of total population in 2016





Source: Eurostat, 2017

Regional (NUTS 2) ageing index of total population. The index is calculated as the number of persons 60 years old or older divided by the number of persons under the age of 15.

The age index is calculated by dividing the number of people more than 59 years old by the number of children under the age of 15. The overall age index in Europe clearly depicts an ageing population. The decreasing fertility rates in Europe are a major factor influencing that trend, such as in Spain and Italy where the fertility rates are particularly low. The regions with particularly high age index in Italy, Greece, Portugal Spain and Germany face increased emigration of the younger generations to other more economically promising regions, to other countries or, as is the case with Germany, to other regions within the country.

In the eastern parts of Germany there is a ratio of more than two elderly people to one child. However, the total nationwide age index is also quite high. Even regions with a low age index value in Germany, formed by the most prosperous metropolitan regions like Munich or Frankfurt, appear old in comparison to the overall EU age index.

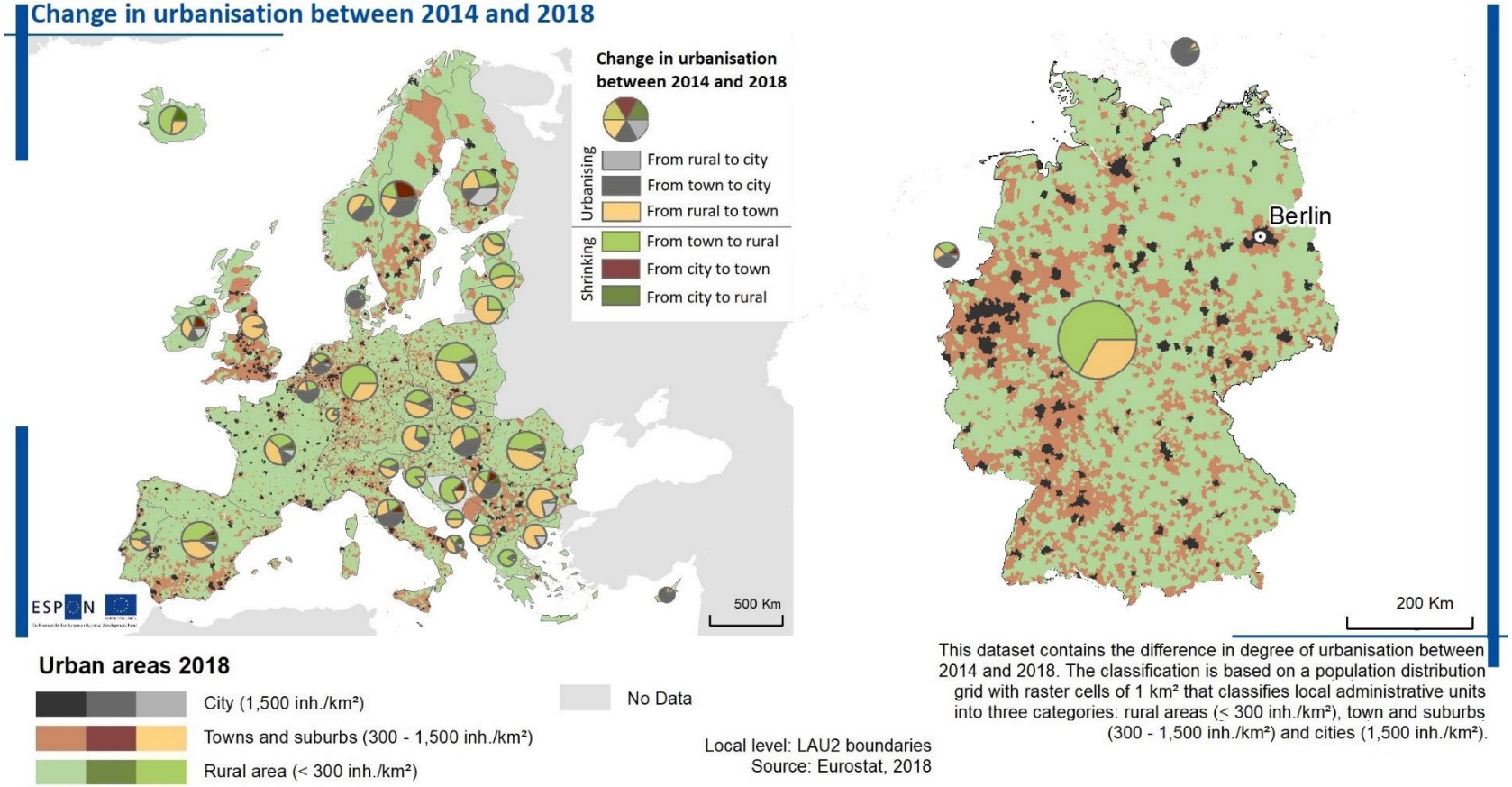
Urbanisation

Change in degree of urbanisation

The polycentric system of population settlement in Germany is noteworthy. More than in many other countries, a variety of cities exists in all parts of the country and towns. Furthermore, suburbs play an important role in the settlement structure.

The surroundings of cities and metropoles gain population both from rural in-migration and sub-urbanisation. The edges of the commuting areas grow further into to surrounding rural areas.

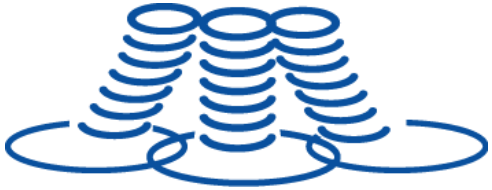
Change in urbanisation between 2014 and 2018



This dataset contains the difference in degree of urbanisation between 2014 and 2018. The classification is based on a population distribution grid with raster cells of 1 km² that classifies local administrative units into three categories: rural areas (< 300 inh./km²), town and suburbs (300 - 1,500 inh./km²) and cities (1,500 inh./km²).

The data used for these maps are derived from the Geographic Information System of the Commission (GISCO). This classification is based on population density rather than building density. The differences between 2014 and 2018 give a good visual impression of population movements. For instance, a large portion of former rural areas in Europe have shifted towards suburban or town-level densities. This increase results from the tendency of the population to spread over large surfaces, “filling up” rural areas. A higher-level densification process can be observed especially in the Lowlands, Norway, Sweden, Finland, Italy and Hungary, with large areas shifting from suburban and town-densities towards city-densities.

The polycentric system of the settlement in Germany is noteworthy. More than in many other countries, and comparable to Belgium and the UK, a variety of cities exists in all parts of the country and towns and suburbs play an important role in the settlement structure. In some areas of the West, towns and suburbs link the cities they surround and create interlinked settlement bands. The changes in population from rural areas to towns indicate the trend of migration from rural regions to commuting zones of the cities, which is also the case around cites in East Germany. The relatively high amount of changes from town to rural areas underlines the spread of population to the rural areas.



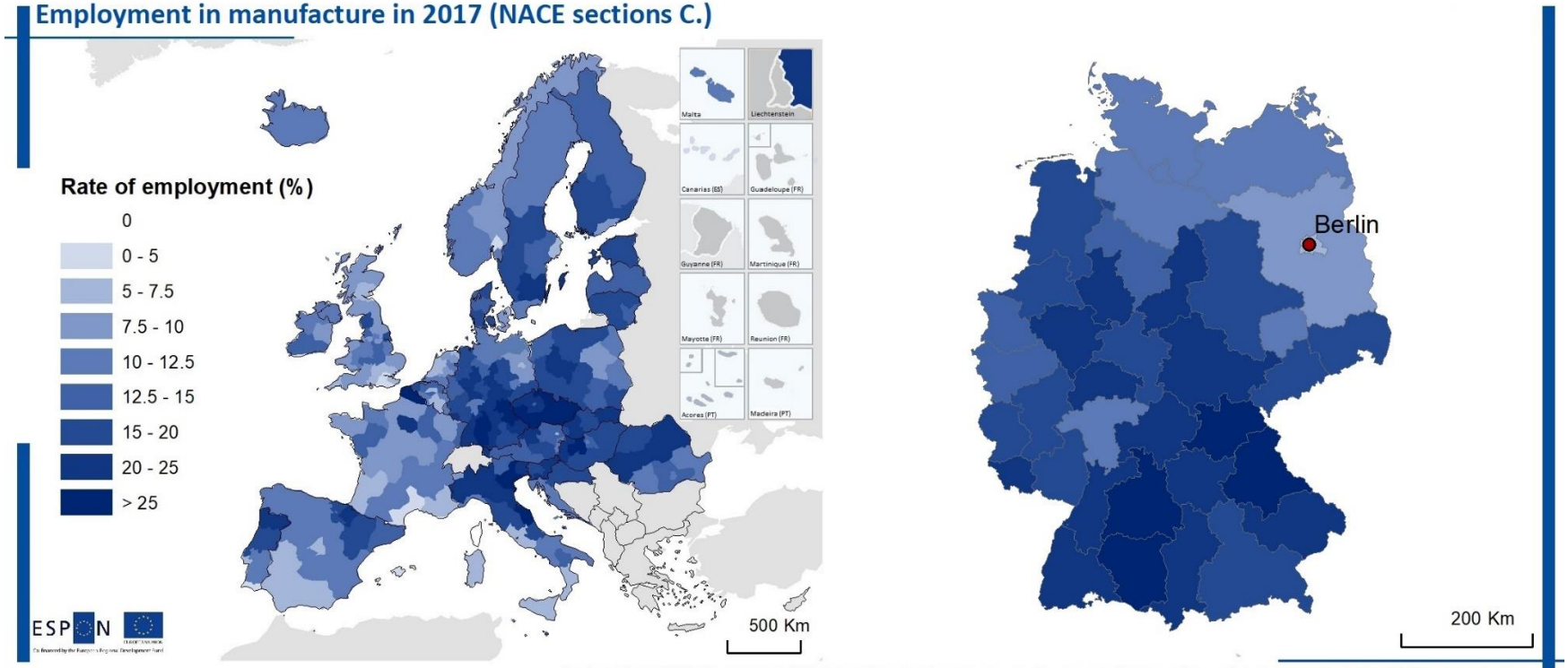
Economy

Employment in manufacturing
Regional Innovation Scoreboard
Small and medium enterprises
Unemployment

In contrast to many other countries in Europe, manufacturing is still the economic basis of many regions in Germany. Even with a relatively low rate of employment in manufacturing in Germany, it is still an above-average value when compared to other countries.

Almost all German regions belong to the so-called “leader regions in innovation” in Europe.

Germany is a hotspot of small and medium sized enterprises (SME) and this can be taken as one indication of innovative potential. Low unemployment rate might be another indication as even the level of the highest rates of unemployment in German regions is still below the lowest rates in many other countries.

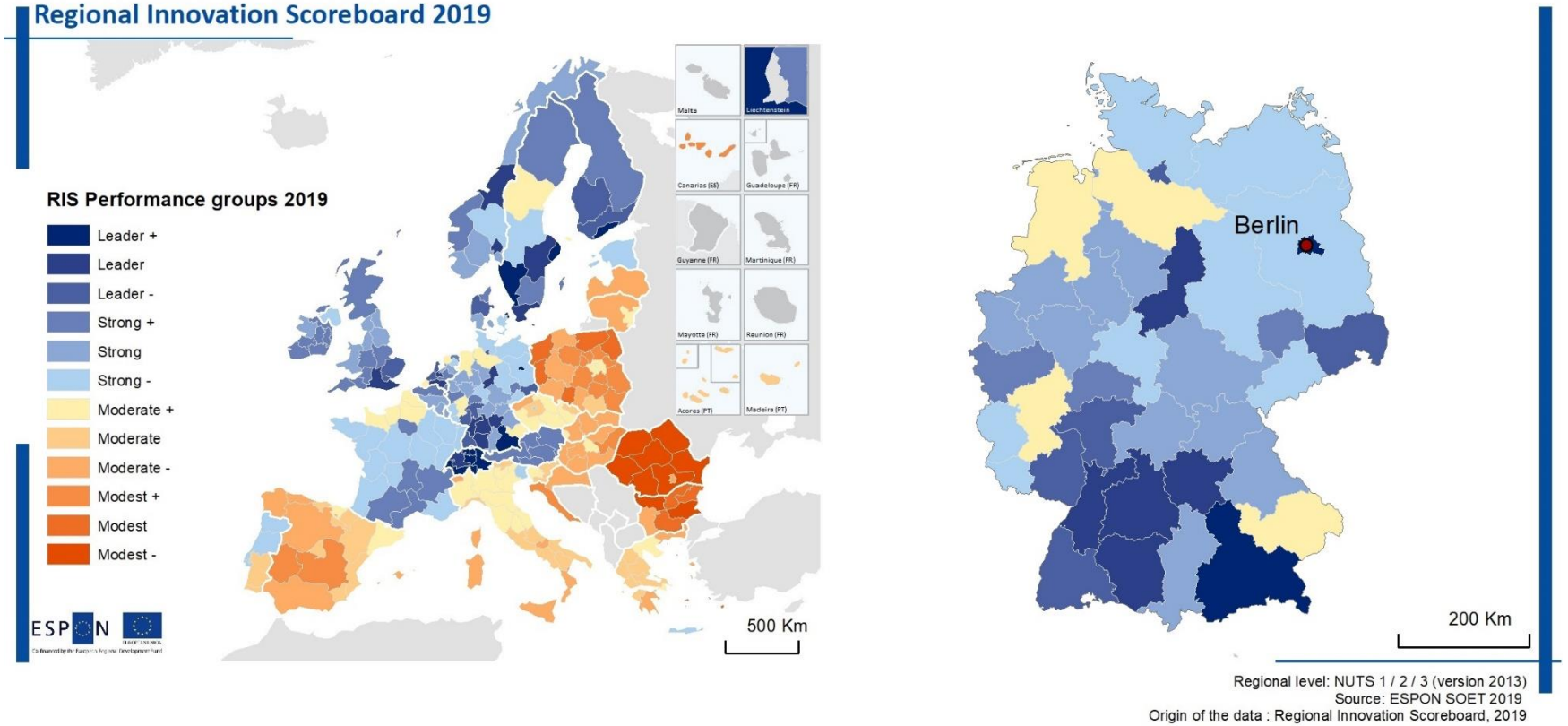


Regional level: NUTS 2
Origin of the data : Eurostat, 2020

Regional (NUTS level 2) rate of employment in the manufacturing sector, section C. according to the NACE categorization. The rate was calculated by dividing the number of employed persons in the sector by the total number of employed persons based on Eurostat data.

Employment rates in manufacturing visualise the 'industrial heart' of Europe. The areas in which manufacturing still plays an important role for employment stretches from Middle Germany, the Czech Republic, the Western parts of Slovakia, and Hungary to Northern Italy. In other countries like Spain, Sweden, or Romania manufacturing regions are clearly visible, whereas in France and the United Kingdom higher employment rates in manufacturing concentrate in just a few regions. This is especially visible in the UK, where manufacturing has only little importance for the labour market.

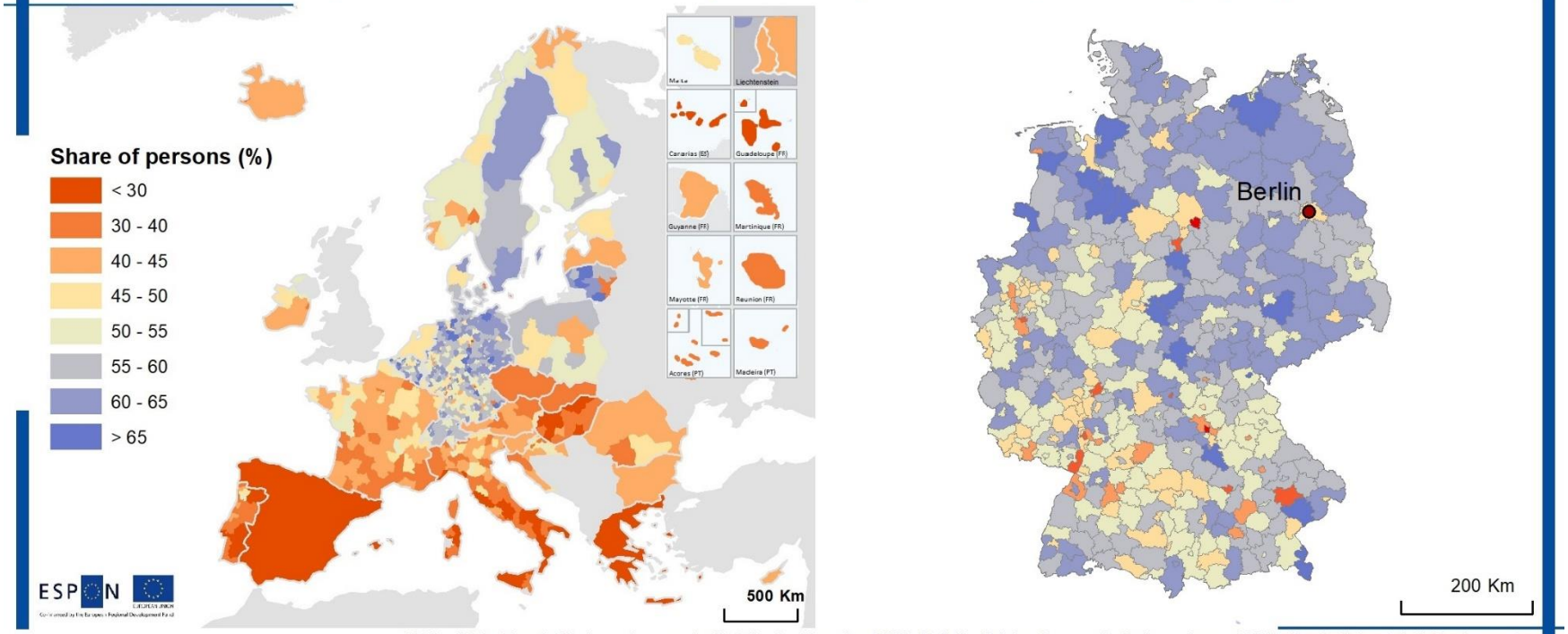
In contrast to many other countries in Europe, manufacturing is still the economic basis of many regions in Germany. Even with a relatively low rate of employment in manufacturing in Germany, it is still an above-average value compared to many other countries. The regions with the highest rate form a central, North-South oriented band, reaching from Schleswig-Holstein, East Westphalia , Lower Saxony, and Hesse to Baden-Württemberg, and East and Northern Bayern.



The regional innovation scoreboard (RIS) measures the regional potential in respect to the educational qualifications of the population, the role of science, the innovation activities of enterprises, the capitalisation of innovation, the application of research and the investments in research and development. To a certain extent, a kind of North and West to South and East divide becomes apparent. Hotspots of RIS are Switzerland and the respective southern regions of Germany, Sweden, Finland, and the Netherlands. Estonia is the only Eastern European region grouped in strong RIS regions.

Based on this index, many parts of Germany belong to the leader regions in innovation in Europe. Upper Bavaria, including Munich and its surroundings, is one of the few Leader+ regions in Europe, followed by Brunswick in the east of Lower Saxony. Almost all regions of Baden-Württemberg are leader regions. In the Eastern part of Germany, the regions of Dresden and Leipzig join the group of strong European regions in innovation. On a lower level, but still Moderate + according to the index, the more rural regions of Bavaria, Rhineland-Palatinate and Lower Saxony are at the level of areas such as Lombardia in Italy.

Share of persons employed in small and medium enterprises enterprises in 2014 (10 - 249 employees)

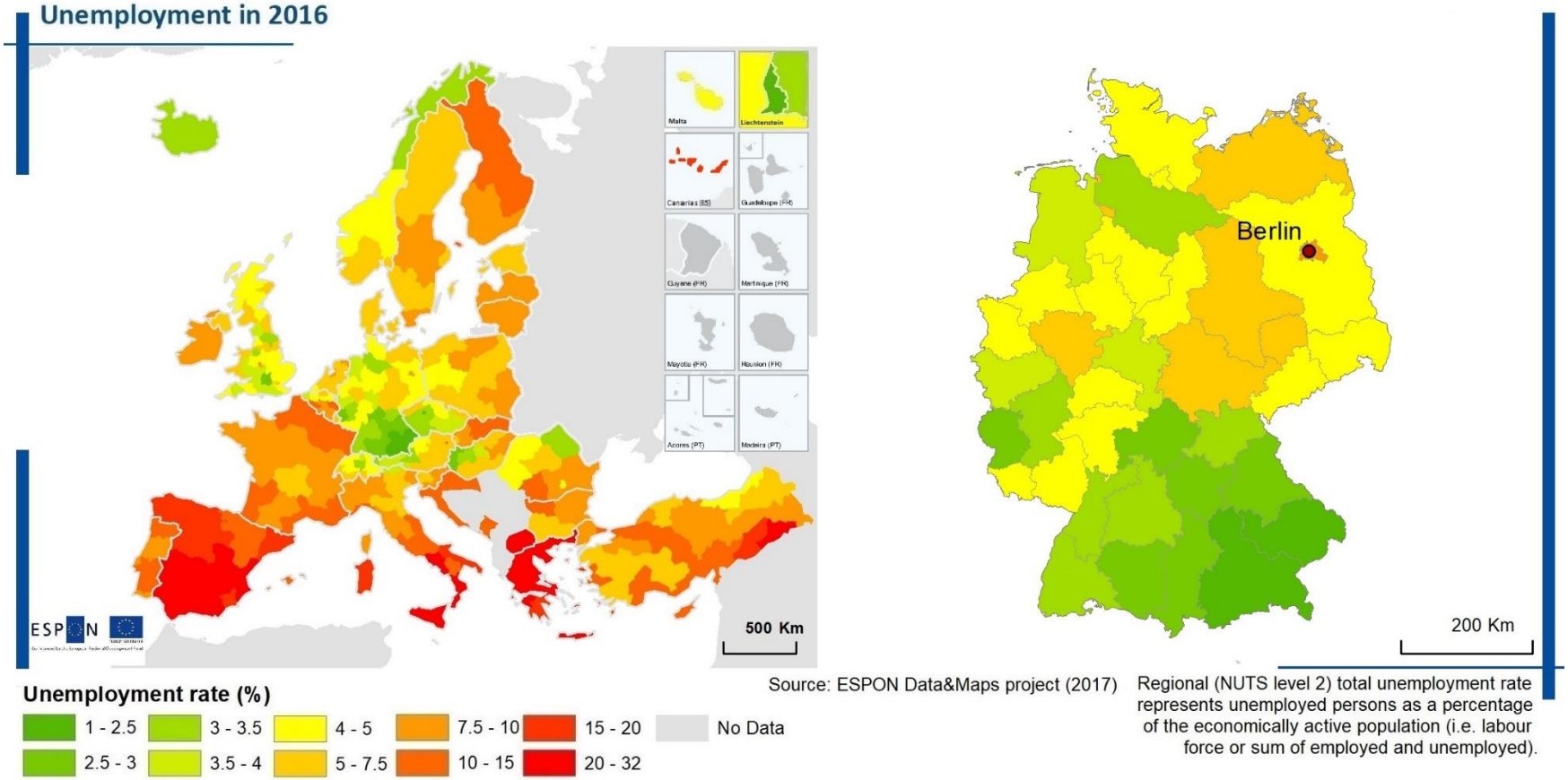


Regional level: NUTS 2 & 3
Source: ESPON SME, 2018

Origin of data: Eurostat Business demography,Statistics Austria national SBS, Statistics Belgium Demografie Ondernemingen, ORBIS, Beschäftigtenstatistik Bundesagentur, national SBS, Statistics Finland national BD, Insee. Direction des statistiques démographiques et sociales (DSDS), Financial Agency, Central Statistics Office (CSO) national BD, Statistics Iceland national BD, Amt für Statistik Fürstentum Liechtenstein - Beschäftigungsstatistik, Statistics Norway national BD, Central Statistical Office Poland national BD, Statistics Portugal Integrated Business Accounts System, National Statistics Institute Romania national SBS, Statistics Sweden Business Register, Bundesamt für Statistik Schweiz, Small Enterprises' Institute of the Hellenic Confederation of Professionals, Craftsmen and Merchants (IME GSEVEE)

The importance of small and medium enterprises (SMEs) for employment is quite different depending on the European country. The role of SMEs is more prominent in Belgium, Germany, Sweden, and in Lithuania, but also in Poland and Finland. In almost all regions of these countries, more than half of persons employed work in SMEs, in some regions that number increases to more than two thirds. Employment in the other countries is more concentrated in larger enterprises. Rates of employment in large enterprises between 30% and 50% are common in France, Austria, and Italy. In Spain and Greece, they contribute up to 30 % of employment.

Germany, in general, seems to be a hotspot of SMEs. To some respect, the overall picture corresponds with the share of employment in manufacturing. In regions with important rates of employment in industrial production, the role of SMEs appears less important. This does not necessarily mean that large enterprises dominate the labour market in these regions, the so-called Mittelstand (SMEs) in Germany includes enterprises up to 500 employees. In must be noted that in more rural areas more than half of the workforce work in SMEs.



Southern Europe suffers from higher rates of unemployment than the central and northern areas. Spain, southern Italy, Greece, and Croatia have some of the highest unemployment rates at 20-32%. These countries were generally hit harder by the financial crisis of 2008. Many regions in Germany, Luxembourg, the Czech Republic, Austria, Norway, North-Eastern Romania, and the UK have very low unemployment rates.

In Germany, the highest unemployment rates concentrate in the eastern, central and northern regions. The regions in the South belong to those regions in Europe with the lowest rates of unemployment, Bavaria with the lowest rate of all. The level of the highest unemployment rates in German regions is still below the lowest rates in many countries like France and Spain.

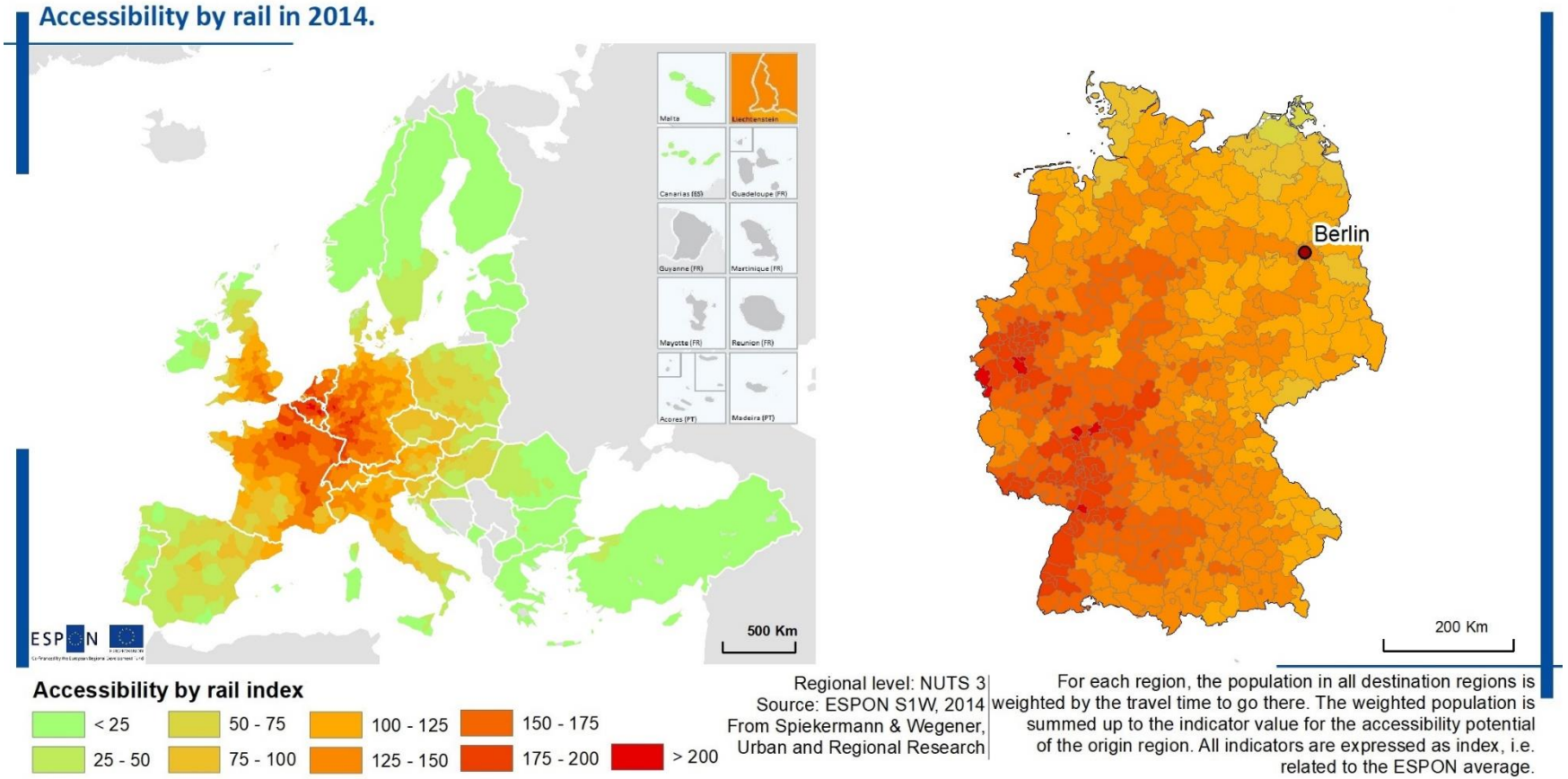
Accessibility and Transport

Accessibility by rail

Cross-border public services

Germany's central position within Europe explains its high potential of accessibility. Corridors of high accessibility indexes by train underline regional integration, in both a national and European context, along the main railway axis to the neighbouring countries and between the national centres.

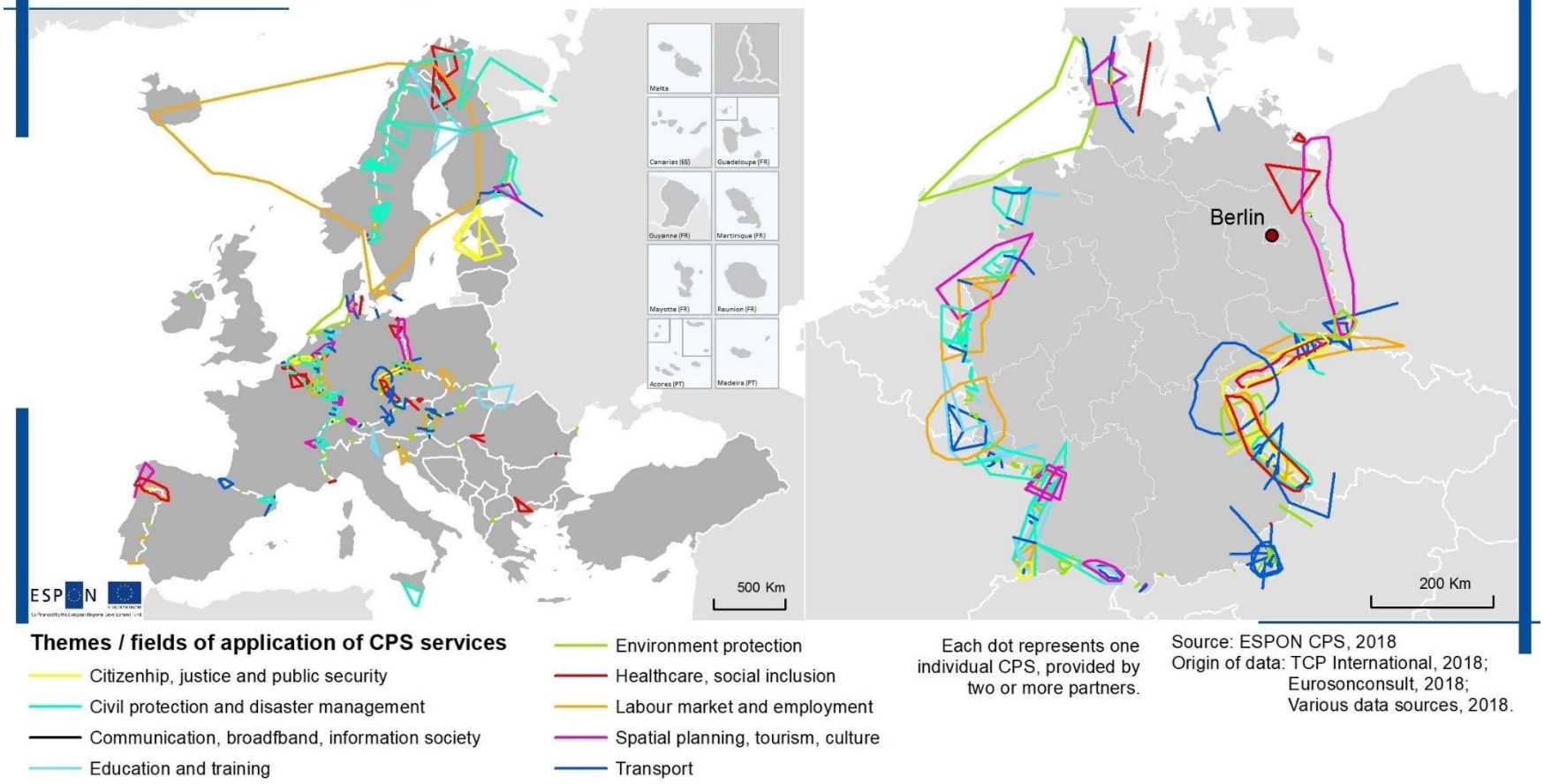
The central position of Germany, which has in total nine neighbouring countries, also explains the intensity and the broad diversity in which it applies cross-border public services.



As regions with top railway accessibility form corridors along high-speed rail links, Germany, West Germany and France stand out. Especially prevalent are the European core areas and corridors in France towards the Atlantic and via Lyon to the Mediterranean regions, or in Germany towards Hannover and Stuttgart. Conversely, lowest accessibility by rail is found in the far northern regions, the eastern regions in Bulgaria and Romania, and Greece. Looking at the differences between regions, there is a clear dominance of urban areas, followed by rural and mountainous regions.

Germany's central position within Europe explains its generally high index values of accessible population by transport in Germany. The main railway axes in Germany are clearly seen in the Upper Rhine Area and the North-South connection to Belgium and the Netherlands as well as the lines connecting Berlin to the West and the South. The high accessibility in between the region along the Main river and the Rhineland base are due to their position on stops of high-speed trains in rural areas.

Cross-border public services: Types of services



Themes / fields of application of CPS services

- Citizenhip, justice and public security
- Civil protection and disaster management
- Communication, broadfband, information society
- Education and training
- Environment protection
- Healthcare, social inclusion
- Labour market and employment
- Spatial planning, tourism, culture
- Transport

Each dot represents one individual CPS, provided by two or more partners.

Source: ESPON CPS, 2018
Origin of data: TCP International, 2018; Eurosonconsult, 2018; Various data sources, 2018.

Cross-border public services (CPS) address joint problems or development potentials of border regions that are located on different sides of one or more nation state borders. The highest share of CPS is found along the borders between the Benelux countries, France, Germany and Nordic countries. The map also shows a high density of CPS along the German-Swiss, French-Swiss, Czech-German, Austrian-German, and Danish-German border(s). This is largely determined by a long-standing tradition of general decentralised cross-border cooperation.

The cross-border areas in Europe start to grow together to some degree. Despite the present obstacles, especially administrative and legal questions, formerly-separated regions mutually benefit from increased cooperation in many topics. In the German regions, there is a broad diversity of CPS. The German-Czech border area shows many different aspects of CPS, at the Eastern border with Poland and the Netherlands in the West, spatial planning, tourism and culture are in the foreground. In the regions between Germany and the Netherlands, Belgium, and Luxembourg the focus is on labour market and employment, whereas on the Austrian border transport-oriented fields of application predominate.

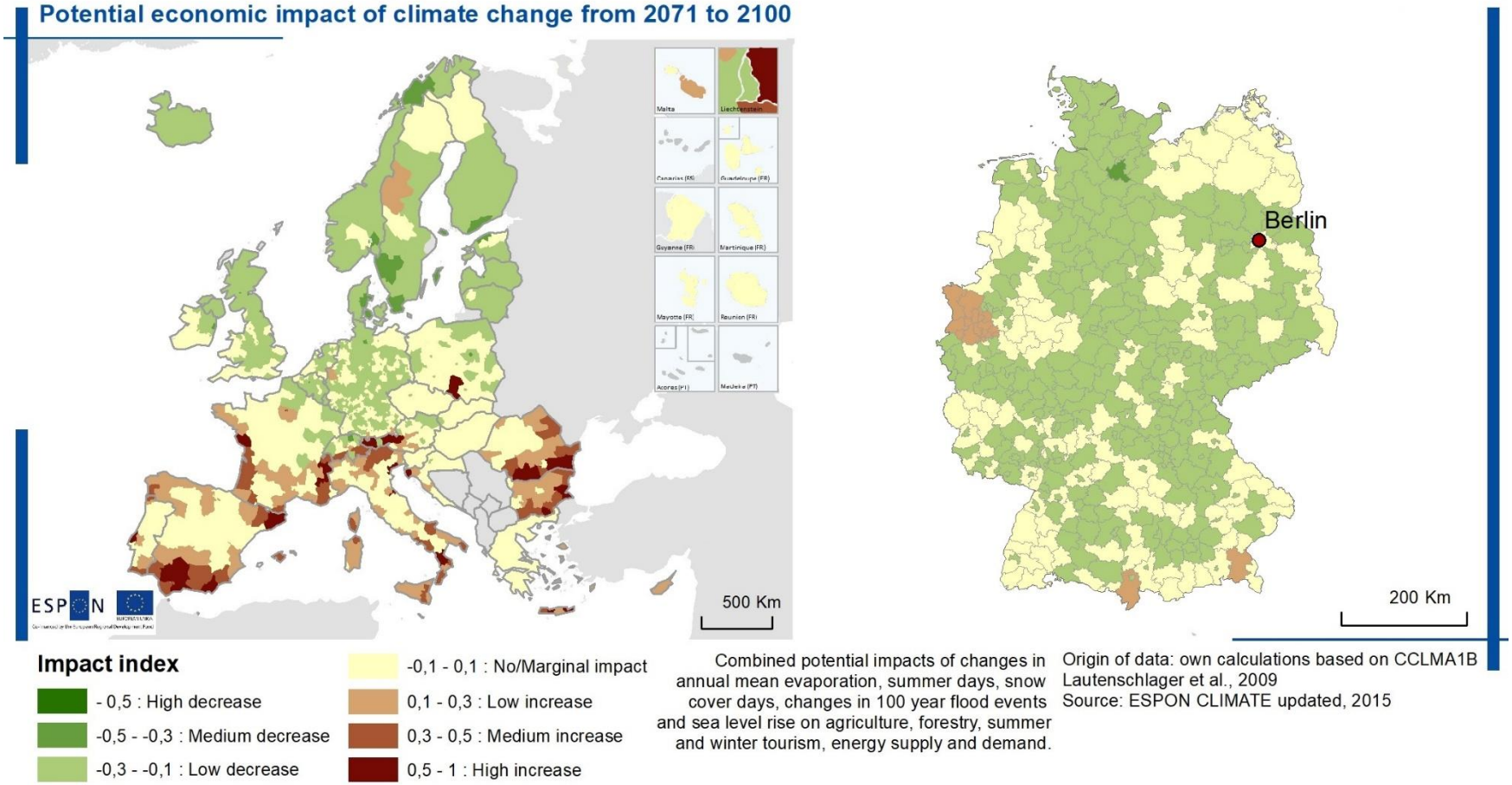
Environment

Climate change impact on economy
Climate change physical impact
Climate change social impact

Climate change will have significant impact in Europe and will increase in the last part of the 21st century. In comparison to other European countries, the potential economic impact of climate change on agriculture, forestry, tourism and energy in Germany will be relatively low or will only slightly decrease in most parts.

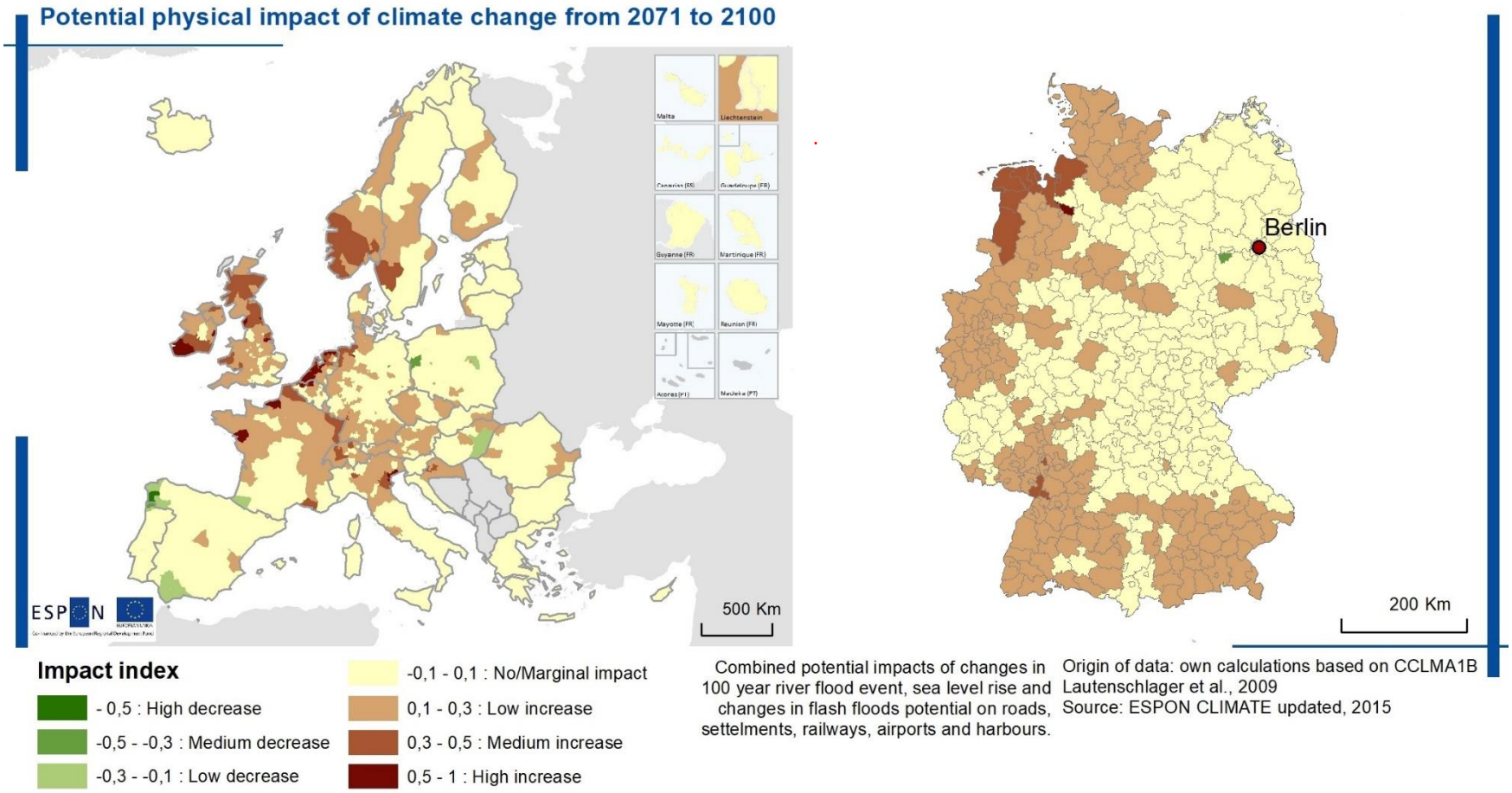
Regarding settlement and transport infrastructure, the impact of climate change will increase in the river basins of the Rhine and Danube and especially along the coastline of the North Sea.

The increase of the social impact of climate change in Germany will occur mainly in urban areas with a higher increase expected in the cities themselves, along the river courses, in coastal regions and especially in the estuaries of important rivers.



Climate change will have significant economic impact in Europe during the 21st century. Some sectors are more sensitive to climate change than others, such as agriculture, forestry, tourism (both summer and winter), and the energy sector. When considering the potential economic impact, there is a clear North-South difference in Europe. To the north, projections are primarily a low decrease in economic impact due to improved environmental conditions for agriculture and lowered demands for heating. To the south, the economic impact is expected to increase due to worsened conditions for agriculture and tourism and increased demand for cooling.

The potential economic impact of climate change on agriculture, forestry, tourism and energy will be relatively low or will only have a slight impact in most parts of Germany in the last third of the century. Low increases concentrate to some respect in the Alpine foothills in the northern extension of high-increase areas in Switzerland and Austria. Another hotspot of increased impact will be the Lower Rhine area, potentially resulting in increasing drought in an already dry area.



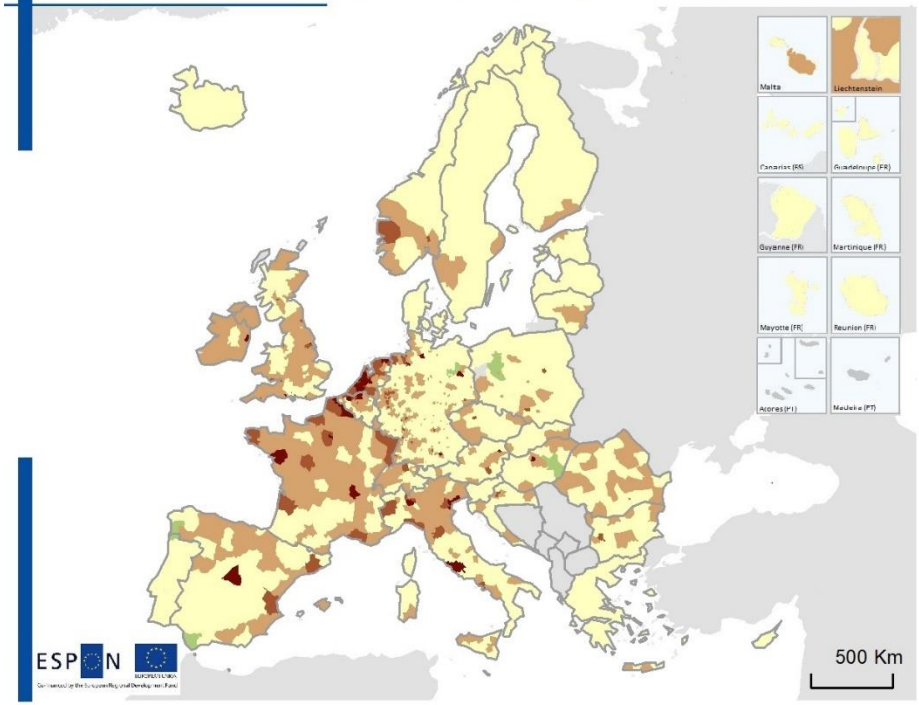
Combined potential impacts of changes in 100 year river flood event, sea level rise and changes in flash floods potential on roads, settelments, railways, airports and harbours.

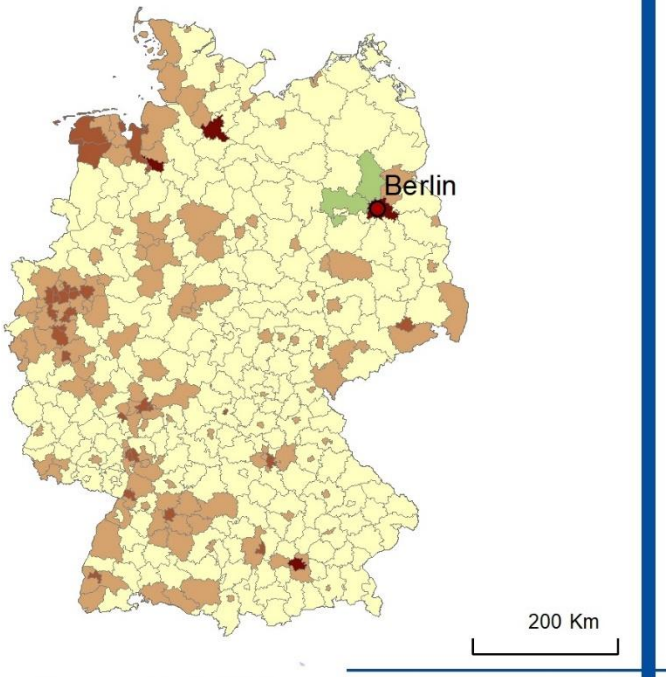
Origin of data: own calculations based on CCLMA1B Lautenschlager et al., 2009
Source: ESPON CLIMATE updated, 2015

A range of physical human artefacts is important to territorial development and can be affected by climate change. These include settlements, roads, railways, airports and harbours. They can be sensitive to extreme weather events, such as floods and storms, which are projected to increase in many areas. In terms of the potential physical impact of climate change, North-Western Europe, regions in and around the Alps and in some parts of Central-Eastern Europe are expected to experience an increase, particularly in coastal areas. The rest of Europe is expected to see only marginal effects.

Sea level rise and flood impacts follow the river basins of the Rhine and Danube. The impact of climate change on infrastructure will be high in these areas, especially along the coastline of the North Sea. The northern part of the Upper Rhine on the German side belongs to a notable cross-border impact area with a large corresponding part on the French side.

Potential social impact of climate change from 2071 to 2100





Impact index

- -0,5 : High decrease
- -0,5 - -0,3 : Medium decrease
- -0,3 - -0,1 : Low decrease
- -0,1 - 0,1 : No/Marginal impact
- 0,1 - 0,3 : Low increase
- 0,3 - 0,5 : Medium increase
- 0,5 - 1 : High increase

Combined potential impacts of changes in 100 year river flood events, sea level rise, changes in flash floods potential and summer heat on population.

Origin of data: own calculations based on CCLMA1B Lautenschlager et al., 2009
Source: ESPON CLIMATE updated, 2015

Human populations may themselves be affected by climate change, for instance, concerning public health and personal mobility. This implies attention to river and coastal flooding, flash floods and heat islands in urban areas threatening senior citizens. The potential social impact of climate change is projected to increase in many parts all over Europe, although somewhat more in western regions, coastal areas and river basins. However, large parts will also experience no effects, or the effects will only be marginal.

The increase of the social impact of climate change in from 2071 to 2100 in Germany will occur mainly in urban areas, with a higher increase expected in the cities themselves. Along the river courses, the population will also be affected by flooding. Higher levels of climate change impact on the population in Germany are also expected in coastal regions and especially in the estuaries of important rivers like the Elbe and Weser and the Jade.

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