ESPON

EUROPEAN UNION

Co-financed by the European Regional Development Fund

Inspire Policy Making with Territorial Evidence

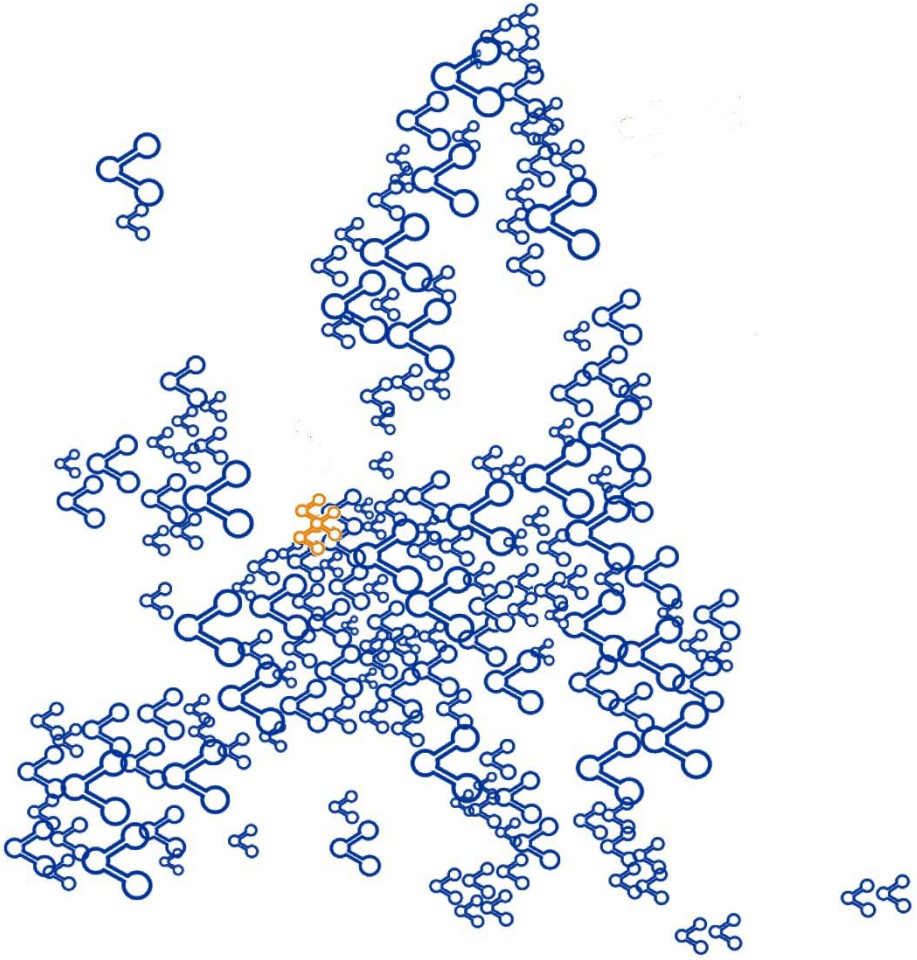
Territorial fiche

Territorial patterns and relations in the Netherlands

Development of the European Space

Sustainable use of natural resources

Socio-economic developments



Interactive version:
https://www.espon.eu/topics-policy/publications/territorial-patterns-and-relations-netherlands-country-fiche

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. Its main goal is to showcase the wide range of ESPON research and, by zooming-in on a specific country, spark interest for the results at a national and regional scale.

The indicators and analyses in this document represent the data availability at the time when the research was undertaken and not the most recent data. This overview is should therefore be regarded as a collection of available findings with different time stamps and not as an up-to-date, comprehensive analysis. Moreover, the analysis is based on data which could be collected or interpolated at the European level, and therefore may not reflect national-level information, which is likely to be more detailed, recent, and accurate. The maps can therefore best be read as benchmarks or to identify international patterns of spatial developments.

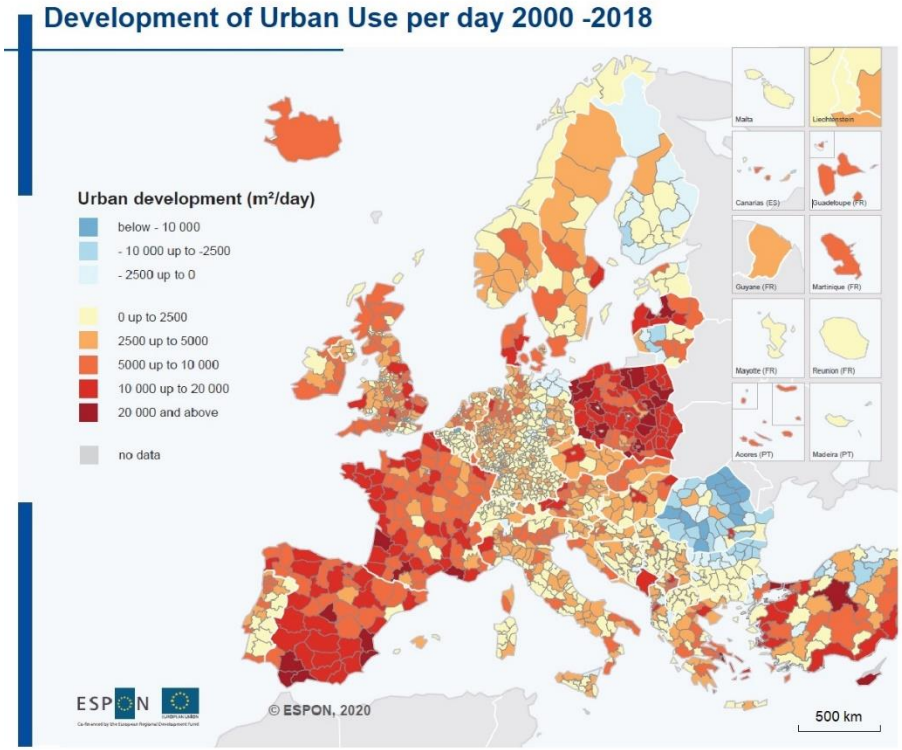
Development of the European Space

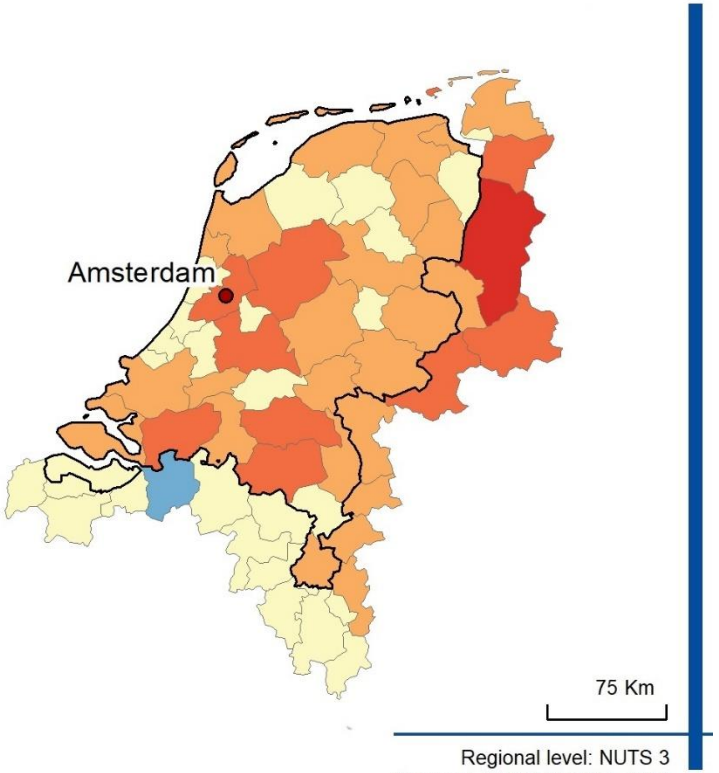
Daily urbanisation rate

Typology of urbanisation per capita

Growth of city regions

The amount of land in Europe is fixed, but its use changes every day. Agriculture and nature convert back and forth at approximately the same rate. Urbanisation, however, is steadily increasing, usually at the expense of agriculture. Given that land is converted to urban use over eight times more than the opposite – called 'land take' or 'urban sprawl' in European policy documents and studies – limiting this has become an EU policy objective, although not one prescribed by law (yet). Evolving land use is, however, highly territorially differentiated and complex and cannot be captured by a single indicator. The ESPON maps presented in this chapter provide insight into how land use has changed over the 2000-2018 period, particularly with respect to urban development. The analysis implies that there is no simple metric to measure the sustainability of land-use change.

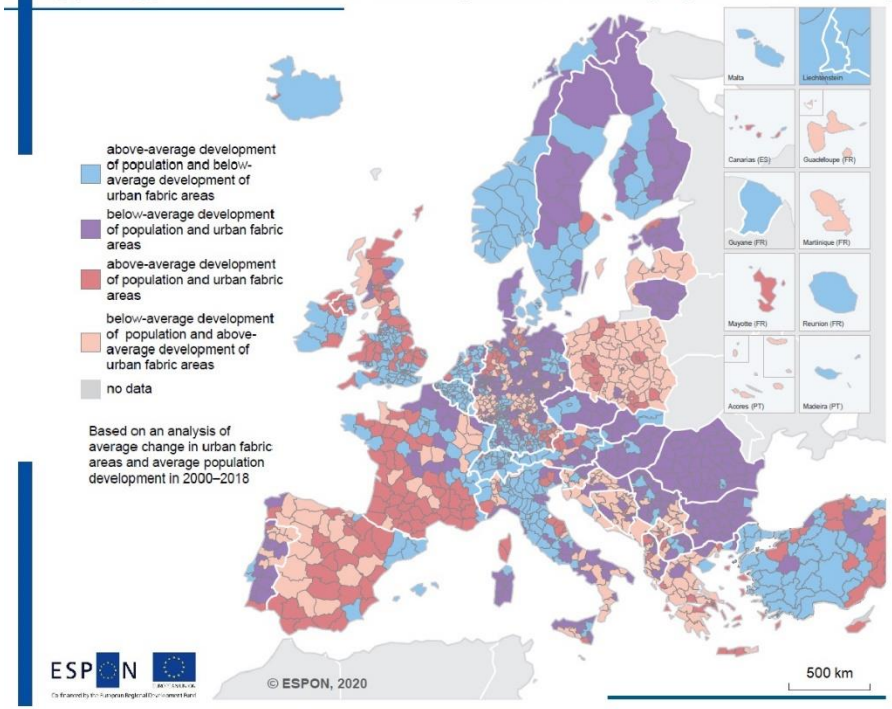


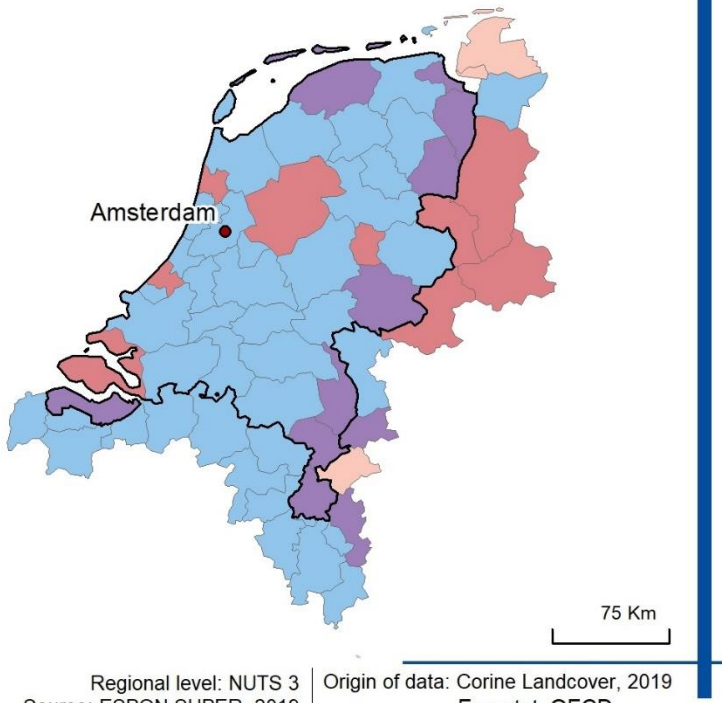


The European Union has set a goal for 'zero net land take in 2050' in its 2011 Roadmap to a Resource Efficient Europe. However, the figures show that actual developments are not in line with this policy objective. Over the period of 2000-2018, 1.17 million hectares of land was converted to urban use, or about 248 football fields per day. This map shows that urbanisation takes place at different rates across Europe, with hotspots in Poland, Spain, France, and Turkey. In general, urban regions such as those around capital cities show the largest increase. This concentration suggests that controlling urban growth will require active involvement of the major cities. A few regions in Europe, however, particularly in Romania, Bulgaria, and Germany, show deurbanisation.

The Netherlands has seen a large increase in urban land over the period of 2000-2018 with respect to its surface area. However, the daily urbanisation rate of Dutch regions is about average for Europe. The most rapidly urbanising NUTS3 regions in this period include cities such as Amsterdam, Rotterdam and The Hague, Utrecht, and Eindhoven and more suburban regions such as Flevoland and Rijnmond, where peri-urban agriculture gave way to housing and commercial developments. Relatively stable regions within the Randstad are found in the Green Heart and along the North Sea coast in the urbanised west part of the country. Others are located in Gelderland and Overijssel and in the middle of the country and Limburg, Groningen and Friesland. Strict spatial planning policy and low demographic pressure can largely explain the geographical distribution of the daily urbanisation rate.

Typology of urban fabric development versus population development



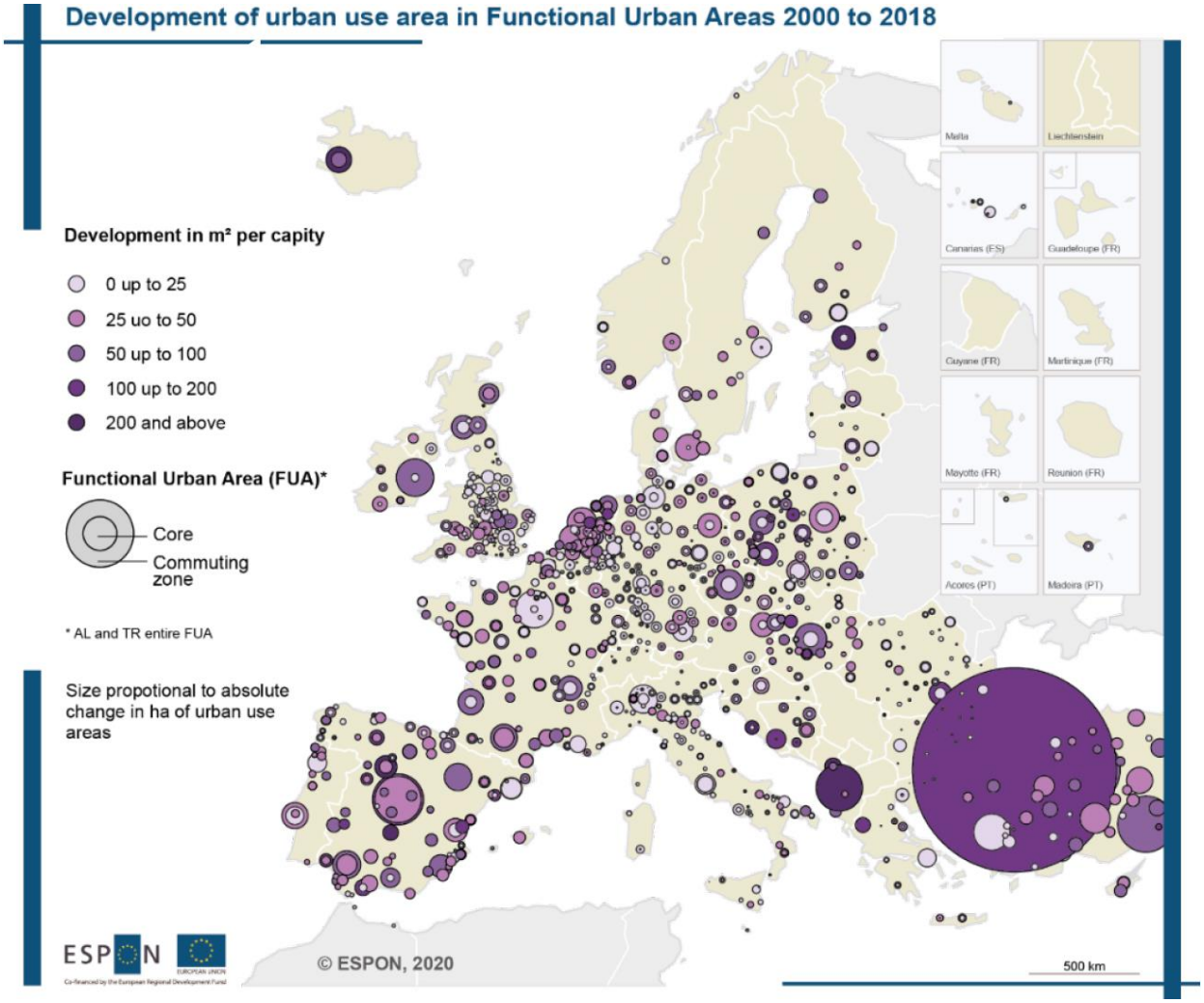


Regional level: NUTS 3
Source: ESPON SUPER, 2019

Origin of data: Corine Landcover, 2019
Eurostat, OECD,
national statistical office

The relationship between change in urban area and population change between 2000-2018 varies across Europe. As a whole, urban land use is increasing faster than population, often one-and-a-half times to twice the rate, indicating declining urban densities. This map displays urbanisation per capita with respect to the European average. Many regions (light red) show above-average urban growth despite population growth below the European average; this category can be viewed as problematic from a sustainability perspective. The shades of dark red indicate above-average increases in both urban use and population. Light blue areas indicate above-average increases in population but below-average urbanisation, suggesting relatively compact or dense development. In purple areas, both urbanisation and population development are below average. This analysis underlines that urbanisation does not necessarily follow population development.

Except for a few peripheral regions, most of the Netherlands experienced above-average population growth between 2000-2018. Of these regions, most also had below-average urbanisation rates, indicating more compact development than the European average. Exceptions include parts of Zeeland, IJmond, The Hague and Flevoland where the rate of urban development exceeded the European average. Even though this interpretation may suggest unsustainable low-density development, we should also remember that existing urban areas in the Netherlands are highly compact. In addition, most low-density suburban development still provides cycling infrastructure and proximity to public services and amenities, thus reducing vehicle travel distances. No Dutch regions fell into the problematic category of high urbanisation and low population growth.



Most urbanisation occurs in or around existing urban centres (functional urban areas (FUAs)), but the magnitude and rate differ across Europe. It is comparatively low in Greece, much of Italy, Romania, and Bulgaria but relatively high in Albania and Turkey, both of which also high with respect to population development (dark shade). The absolute and relative growth of Istanbul with respect to the rest of Europe is remarkable, as is the fact that the urban growth is outstripping the population development by far. The urban densities and growth can be observed, when available, by comparing the colours and size of the concentric FUA circles, respectively. Higher growth is typically found in the commuting zone than the core city, especially around Dublin, Prague, Budapest, and Berlin. This is less pronounced around Athens, Paris, and Barcelona. As urbanisation typically crosses over municipal boundaries, cooperation at the FUA level or higher is advisable to achieve sustainable urbanisation goals. Given the different rates of change and core/suburb relationships, a place-based approach should be followed.

Zooming into the Netherlands, it is obvious that the European classification of FUAs is problematic. The highly polycentric structure makes it very difficult to distinguish between core and hinterland given the high interconnectedness. The city/commuter zone analysis is only visible in a handful of monocentric areas in the Netherlands such as Leeuwarden and Groningen. In comparison to Flanders and the Ruhr area, virtually all FUAs in the Netherlands are growing rapidly with respect to population development, indicating decreasing densities. This is particularly pronounced in the more suburban FUAs such as in the province of Zeeland and Flevoland. Still, the most important message may be that the FUA classification is problematic for polycentric areas.

Sustainable use of natural resources

Spatial Distribution of Green Infrastructure

Urban use in protected areas

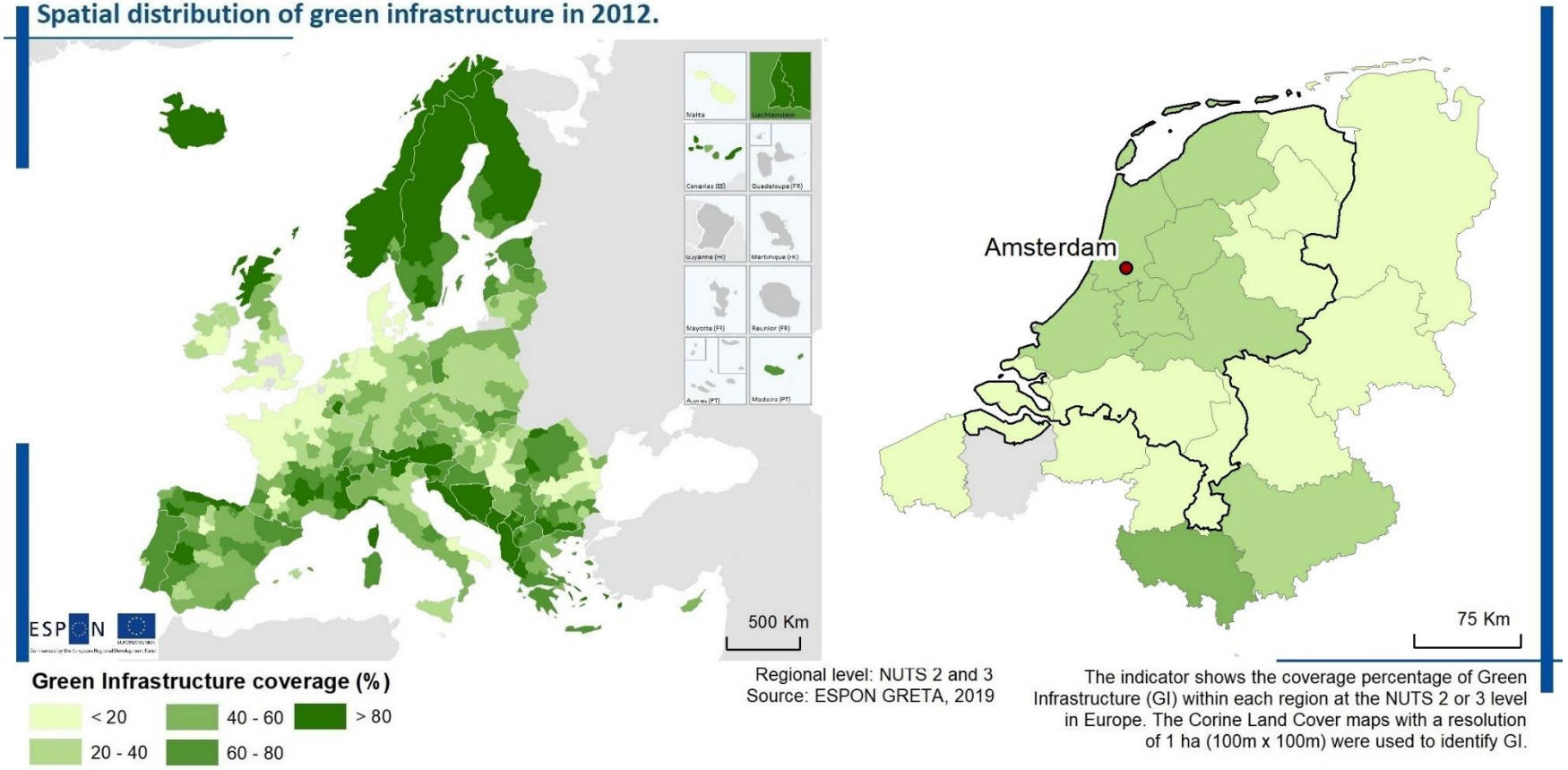
Climate change impact

Climate change resilience

Consumption and waste

This chapter focuses on green infrastructure, protected areas, land-use and artificial areas, waste management, and circular economy as well as their contribution to a more sustainable Europe. However, ESPON evidence shows that not all regions have the same resources and opportunities for sustainable solutions. In this context, Dutch regions are well situated when it comes to sustainable use of natural resources. This chapter tells the story of the importance of natural resource management in all European regions.

Spatial distribution of green infrastructure in 2012.

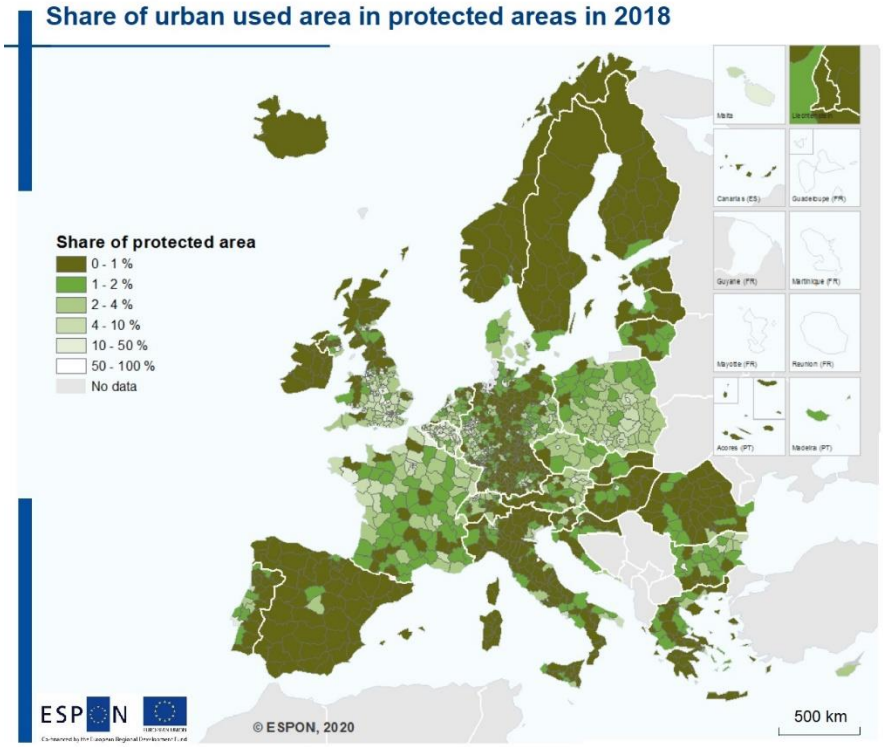


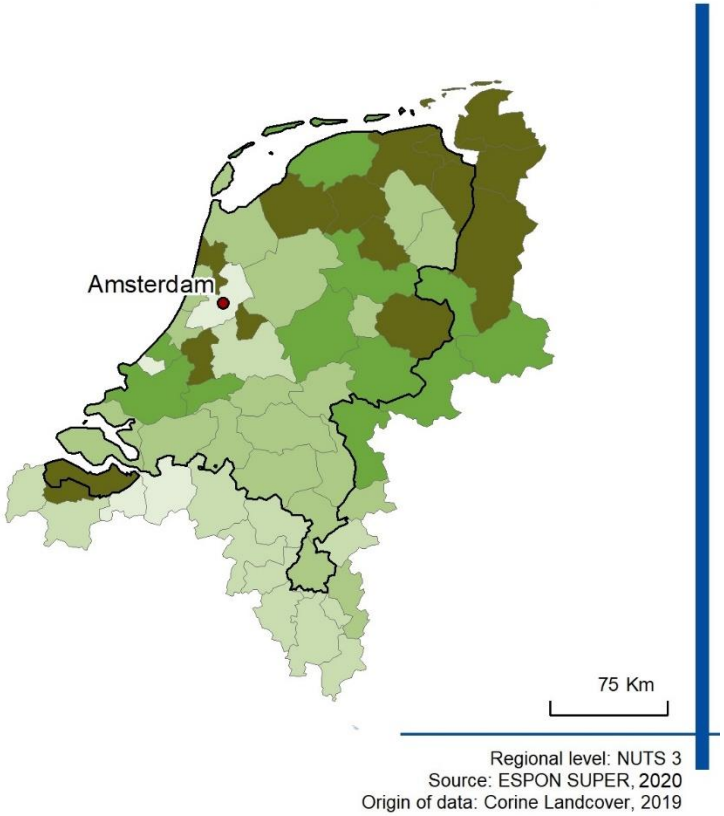
Regional level: NUTS 2 and 3
Source: ESPON GRETA, 2019

The indicator shows the coverage percentage of Green Infrastructure (GI) within each region at the NUTS 2 or 3 level in Europe. The Corine Land Cover maps with a resolution of 1 ha (100m x 100m) were used to identify GI.

The European Natura2000 network covers approximately one fifth of the territory of the member states. This, plus national policies (including those of non-EU members) can be called the European Green Infrastructure (GI). GI is, therefore, a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services. This map visualises the differences in the spatial distribution of GI coverage across European regions in 2012. Regions along the Northern Sea have relatively low GI coverage while it is high in Nordic countries, the Balkan countries along the Adriatic Sea, and in the eastern Alpine regions. Generally, regions in southern Europe had a high percentage of GI coverage in 2012.

The Netherlands is famous for its main ecological network policy, launched in the 1990s. This comprised the basis for the current Natura2000 network at the European level and has since been redubbed as 'green infrastructure'. The share of GI is below the European average as is much of northwest Europe. The fact that so much of the Netherlands exceeds the 20% threshold is remarkable given its population density, reflecting decades of restrictive planning and active purchasing of land for preservation. Moreover, the figures for the Netherlands might be an underestimate due to small green spaces that lack formal designation, for example rivers in cities (Rotterdam) and GI in small towns.

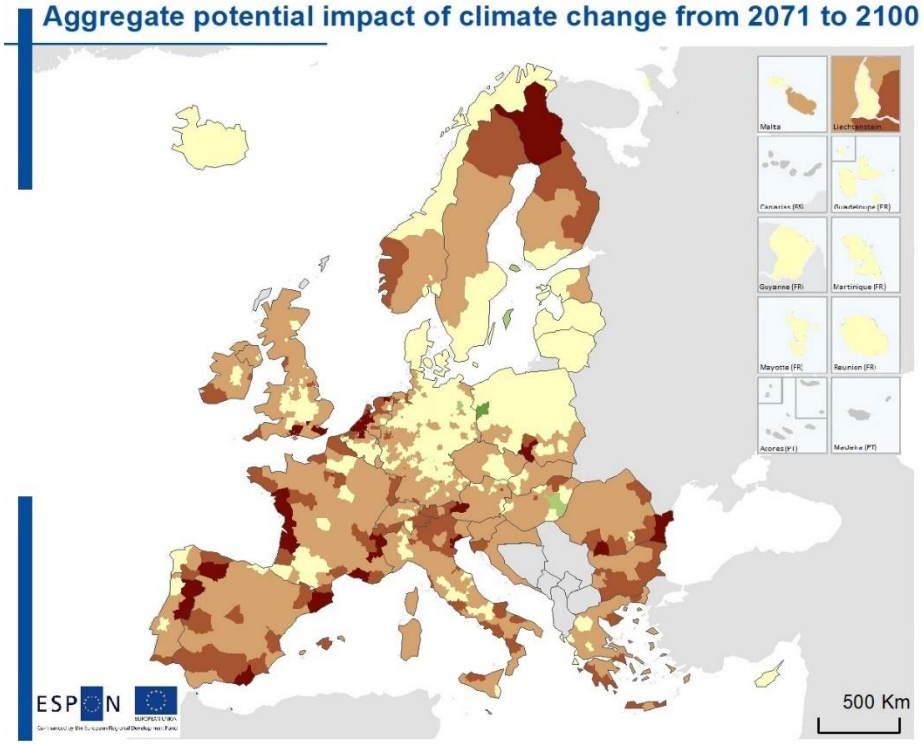


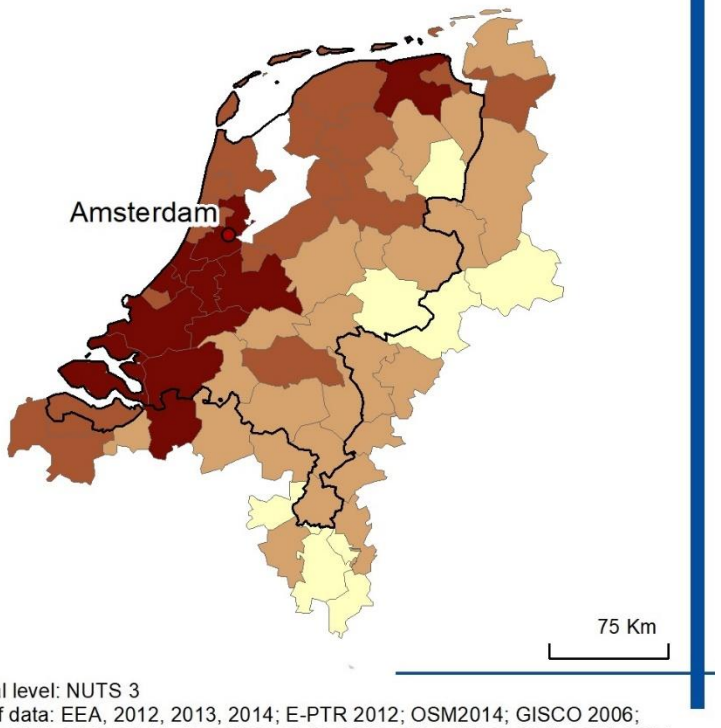


Regional level: NUTS 3
Source: ESPON SUPER, 2020
Origin of data: Corine Landcover, 2019

European Green Infrastructure (GI), shown in the previous map, is generally easier to implement in areas with little competing land-use claims. In some parts of Europe, GI has been implemented in urban regions, giving it a different function and character than more remote areas. In order to gain an impression of the differing types of GI (and the associated ecosystem services) this map shows the share of urban land use in protected areas at the NUTS3 level. In some parts of Europe, this is minimal to non-existent, particularly at the European periphery. Other regions show a high level of overlap between natural and urban uses, such as in Poland, Denmark Belgium, and England. In these areas, GI is likely to be an important spatial planning issue and likely more fragmented.

It is interesting to compare the Netherlands and Flanders as both have similar levels of urban density, but rather different urban and GI structure. In general, the Netherlands has designated larger areas for protection than Flanders and has a more compact urban structure, which is reflected in the lower shares of urban use in protected areas. In fact, some regions near Amsterdam have extremely low levels of urban use in protected areas, indicating strong separation of functions. For both countries, the high development pressure and existing urban densities mean that GI policies are soon considered as parameters (either as limits to or requirements for) for urban development, thus complicating spatial planning.

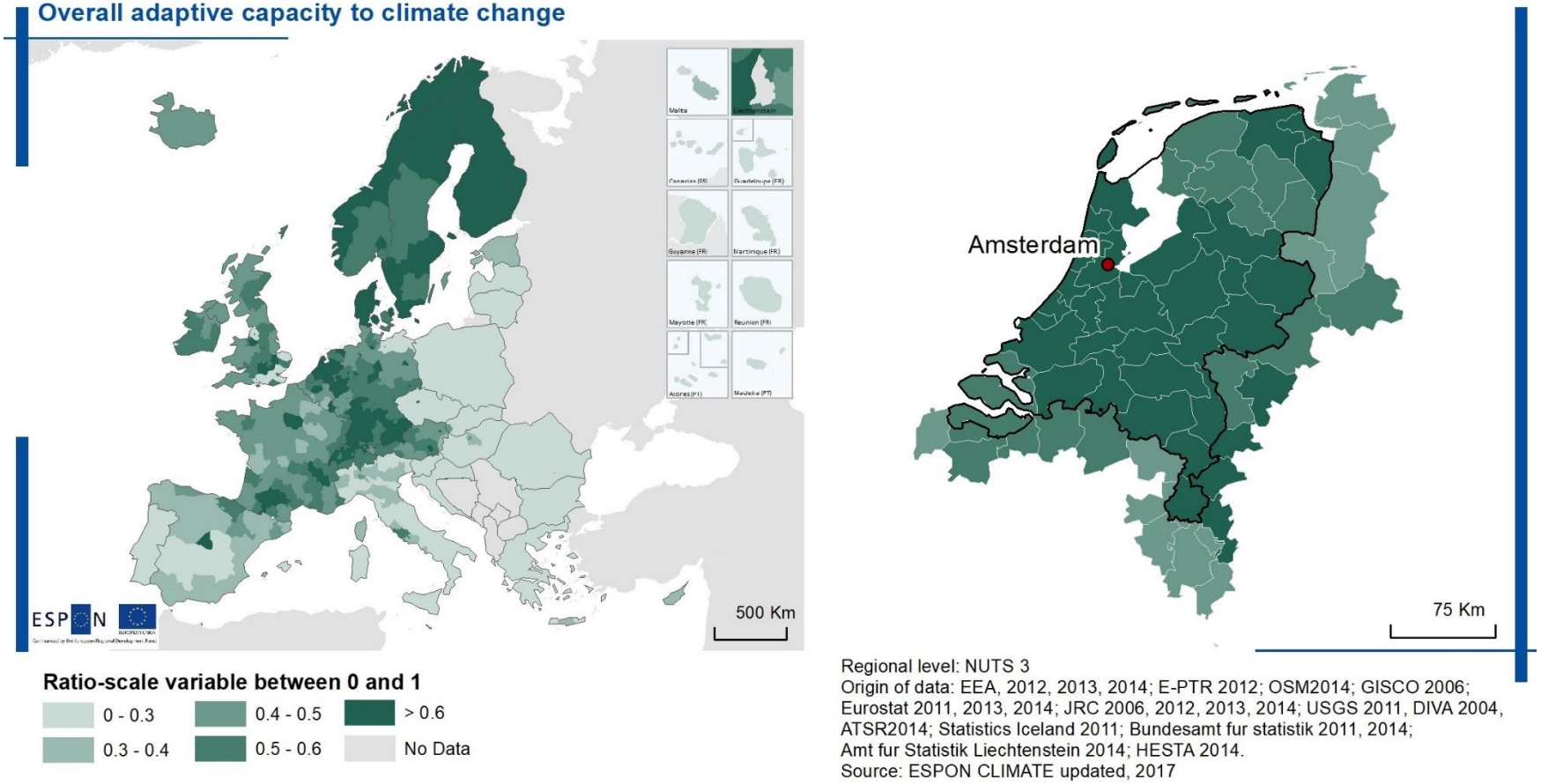




Regional level: NUTS 3
Origin of data: EEA, 2012, 2013, 2014; E-PTR 2012; OSM2014; GISCO 2006; Eurostat 2011, 2013, 2014; JRC 2006, 2012, 2013, 2014; USGS 2011, DIVA 2004, ATSR2014; Statistics Iceland 2011; Bundesamt fur statistik 2011, 2014; Amt fur Statistik Liechtenstein 2014; HESTA 2014.
Source: ESPON CLIMATE updated, 2015

Climate change is expected to impact most European regions by 2100. The computed potential impact is aggregated into the degree of exposure (the extent to which a region is facing natural hazards or climate change impacts), the sensitivity of the region (the economic, social and ecological damage potential which is assessed, in this context, by using the regional GDP per capita) and their capacities to respond (the ability to react to and mitigate which, in this context, is addressed by taking into account national GDP per capita). The impact of climate change concentrates mainly along regions with natural borders (rivers, mountains, coastal regions).

As a significant portion of the Netherlands lies below sea level, the country is particularly vulnerable to flooding, compared to its immediate neighbours. The expected effects of climate change regarding more river discharge from the east and rising sea levels to the west, lead to a high potential impact. Except for a few regions where a low impact is expected, the entire country falls into the negative potential impact category. This is most predominant in the low-lying western part, which is also the most populous and with the highest GDP, indicating high sensitivity. An option to reduce vulnerability would be to shift urban development to the national periphery. However, predictions seem to indicate the opposite.

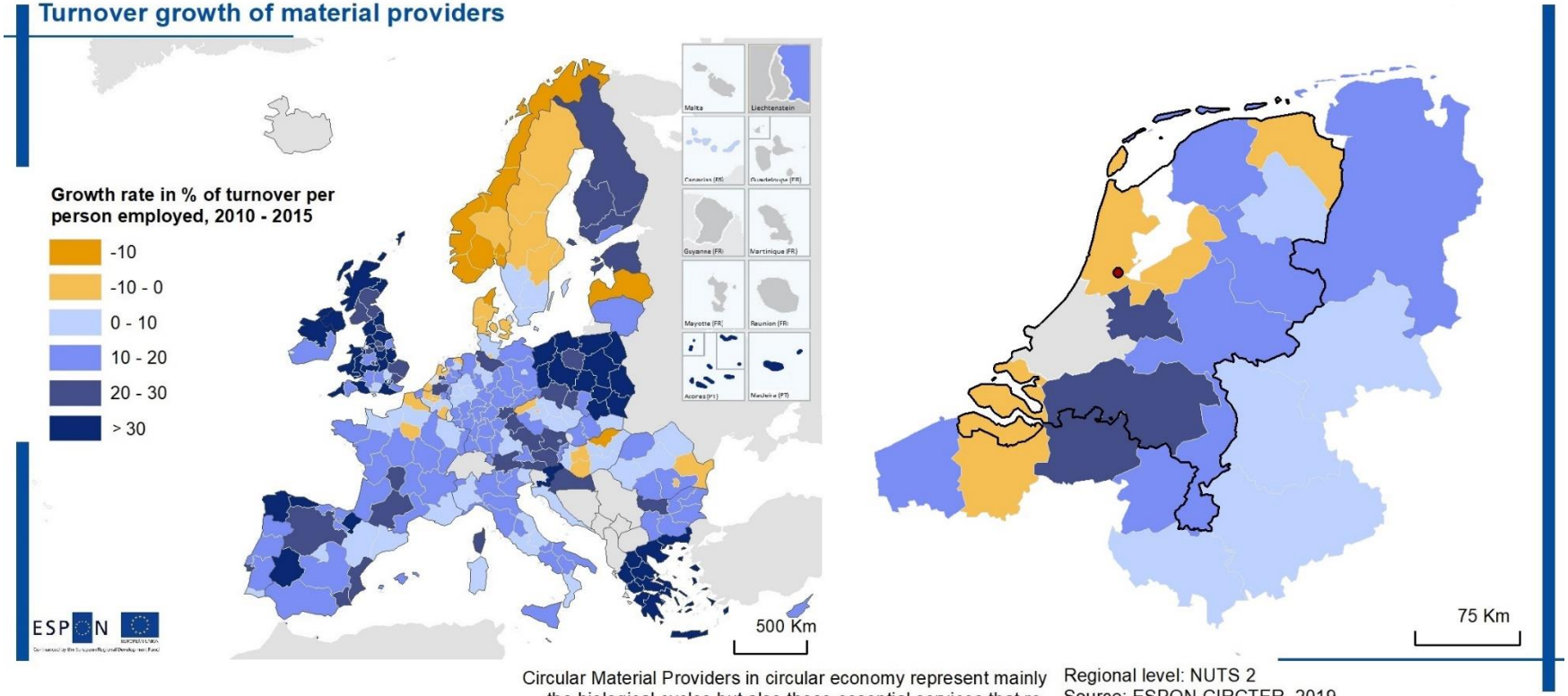


Regional level: NUTS 3
Origin of data: EEA, 2012, 2013, 2014; E-PTR 2012; OSM2014; GISCO 2006; Eurostat 2011, 2013, 2014; JRC 2006, 2012, 2013, 2014; USGS 2011, DIVA 2004, ATSR2014; Statistics Iceland 2011; Bundesamt fur statistik 2011, 2014; Amt fur Statistik Liechtenstein 2014; HESTA 2014.
Source: ESPON CLIMATE updated, 2017

This map shows the overall adaptive capacity of European regions in 2017. The overall adaptive capacity is an aggregate indicator composed of indicators from the ESPON Climate project (including annual mean temperature, annual mean precipitation, change of inundation through river flooding etc.). The overall adaptive capacity is calculated as a weighted combination of economic capacity, infrastructural capacity, technological capacity, knowledge and awareness, and institutional capacity. Three types of regions score high on this indicator: the vast natural lands in Scandinavia with few settlements, national capitals, and Austria and the Netherlands.

A long tradition of water management in the Netherlands has contributed to its high adaptive capacity. It is interesting to compare this map of adaptive capacity to the potential impacts of climate change. Whereas the latter indicates a high level of potential negative impact, this map shows a high capacity to adapt. Given that this adaptive capacity largely regards national policy and know-how, and that infrastructure capacity is shared, this should probably be the same throughout the entire country. The regional differentiation is likely a function of the economic capacity.

Turnover growth of material providers

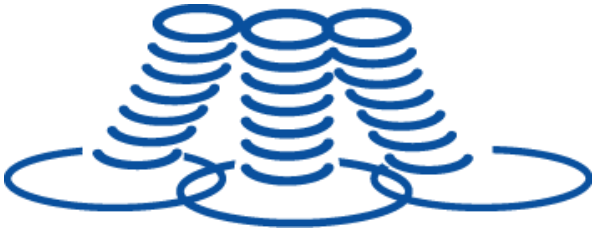


Circular Material Providers in circular economy represent mainly the biological cycles but also those essential services that re-introduce wastes as resource into existing value chains. They provide materials comprised of renewable and recycled materials.

Regional level: NUTS 2
Source: ESPON CIRCTER, 2019
Origin of data: Eurostat, 2019, calculated by Prognos AG.

This map shows the growth rate of turnover of material providers per person employed in 2010-2015. Specific indicators were developed and used for this map based on the ESPON CIRCTER project. Organic farming, sustainable forestry, and the provision of wood materials, waste collection, and recycling services are examples of the circular economy material providers sector. Circular economy providers make an important contribution to the economic structure of regions, with up to 13% of employment in some European areas. Sustainable agricultural and forestry activities have an important role, especially in rural areas. Thus, this map also shows the mechanisation, intensification and specialisation of forestry and agriculture. Poland, Greece, and regions in Spain have an above-average turnover growth of material providers.

The Netherlands shows a complex picture, as regions fall into various categories with a decline in the rate of turnover of material providers per person employed in regions in Zeeland, Groningen, Noord-Holland and Flevoland but rather large increases in Utrecht and Brabant. Unfortunately, data is absent for much of the Randstad area. It would be interesting to know if this was also declining or not. Finally, correct interpretation of this map requires local knowledge. Without knowing the starting position of regions, it is difficult to understand the significance of the change during the period of 2000-2015: a very low turnover in 2010 can show significant growth as a percentage but remain insignificant in absolute terms.



Socio-economic developments

Regional innovation scoreboard

Global accessibility

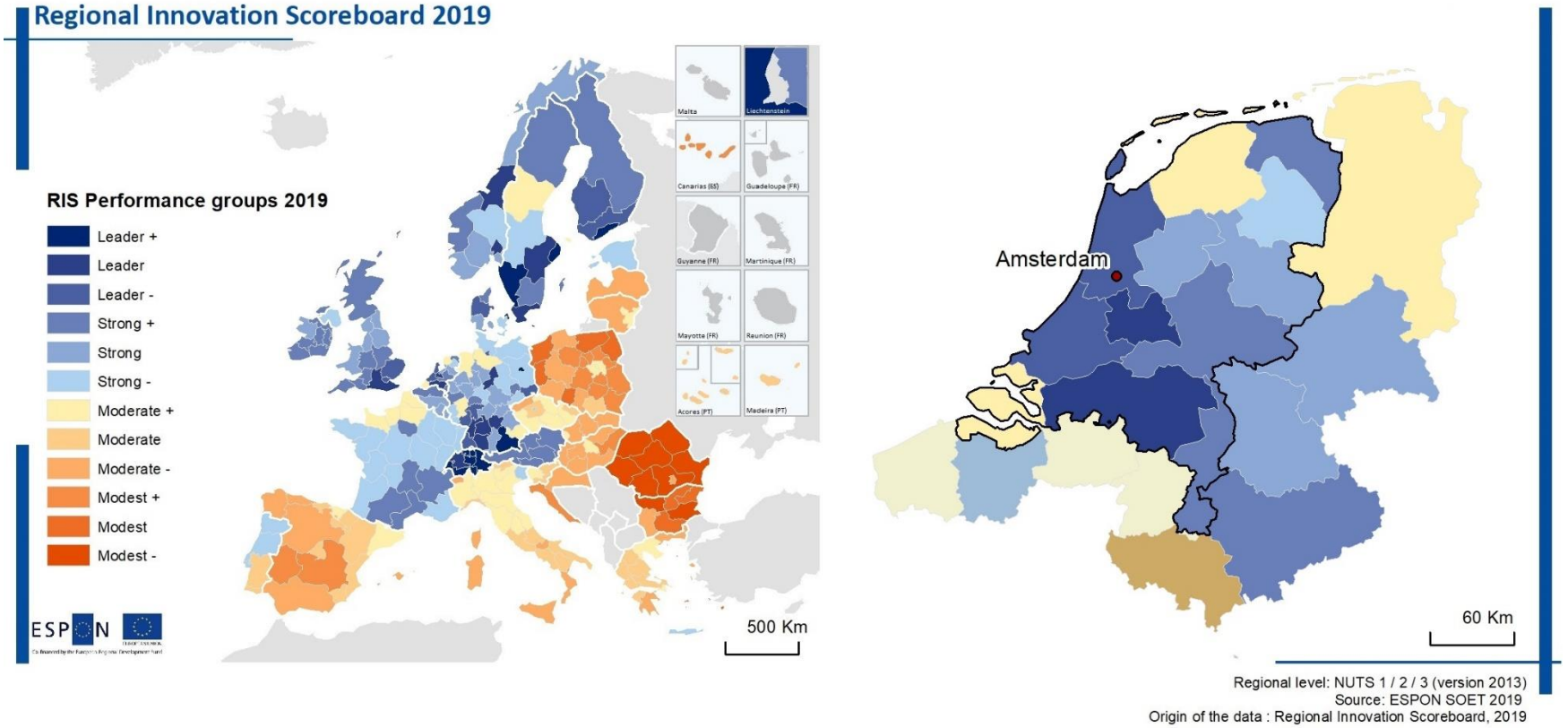
Micro-enterprises

Economic fragmentation

Housing cost burden

Foundations of well-being

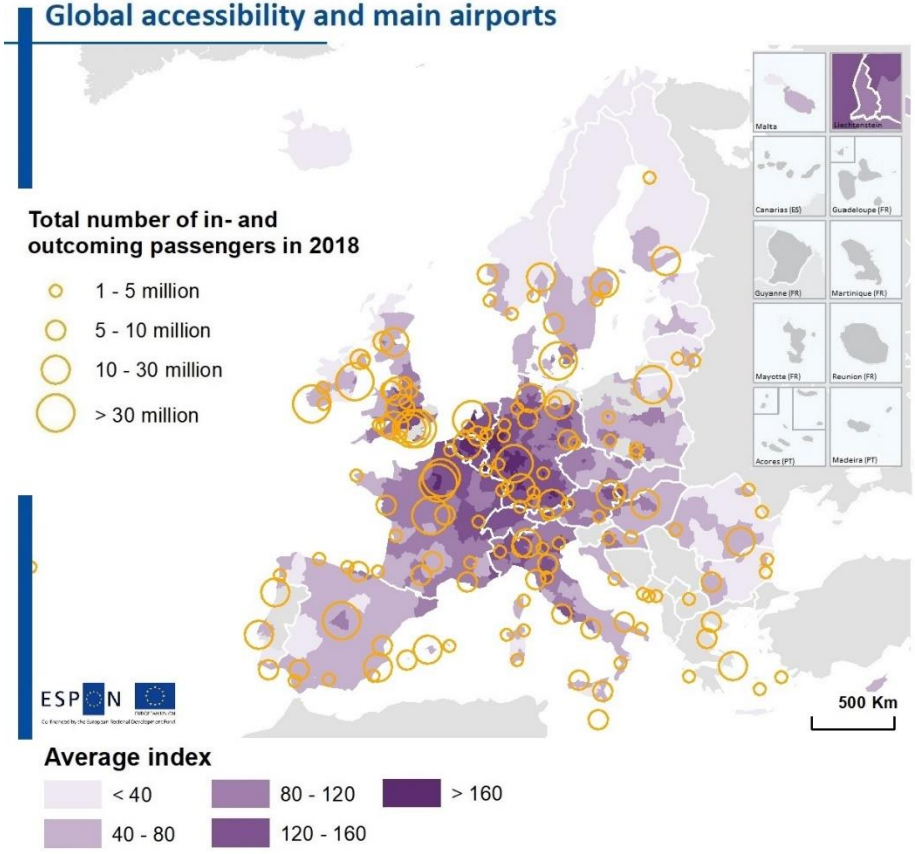
The Netherlands is well-positioned in the global economy. The port of Rotterdam is the largest in Europe, various universities rank in the European top levels and internet speed and capacity are virtually unparalleled. As such, it is a magnet for foreign investments and migrants, which results in high housing costs. How well do Dutch regions perform within Europe with respect to quality of life indicators? Do Dutch households pay too much for housing? What is the share of small firms in the Netherlands? Which regions lag in the Netherlands with respect to the national average? These questions and more are addressed in this chapter.

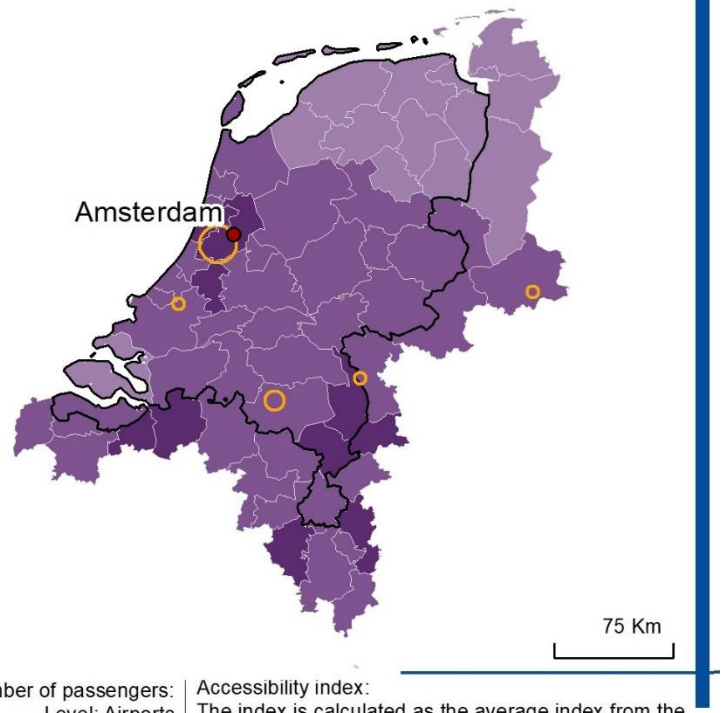


The regional capacity to innovate is an essential parameter for meeting a range of fundamental environmental and spatial challenges, such as adapting to climate change and facilitating the energy transition while retaining spatial quality. There is a tradition in Europe of excellence in R&D and innovation, however, this is unevenly distributed. NUTS2 regions in Scandinavia, north-west Europe, southern Germany and Switzerland tend to be the strongest innovators, while this is comparatively modest in southern and eastern Europe. In addition to the total score, the Regional Innovation Scoreboard defines different innovation types: science-based, applied science, smart technological application, creative diversification, and imitative innovation areas.

The Netherlands is among the top performers in Europe on the innovation scoreboard. This map is scaled at the provincial level, showing the excellent position of Noord-Brabant, owing in no small part to the patents filed by Eindhoven University of Technology and its related businesses. Most of the urbanised part of the country scores strongly on the EU's innovation scoreboard, with only Friesland and Zeeland falling into the 'moderate' category. With respect to the innovation typology, the Netherlands generally falls into the 'smart technological application' category; it is less oriented to the production of basic science and more on its practical use. This seems to fit the reputation of the 'Brainport Eindhoven' as a triple-helix cluster.

Global accessibility and main airports



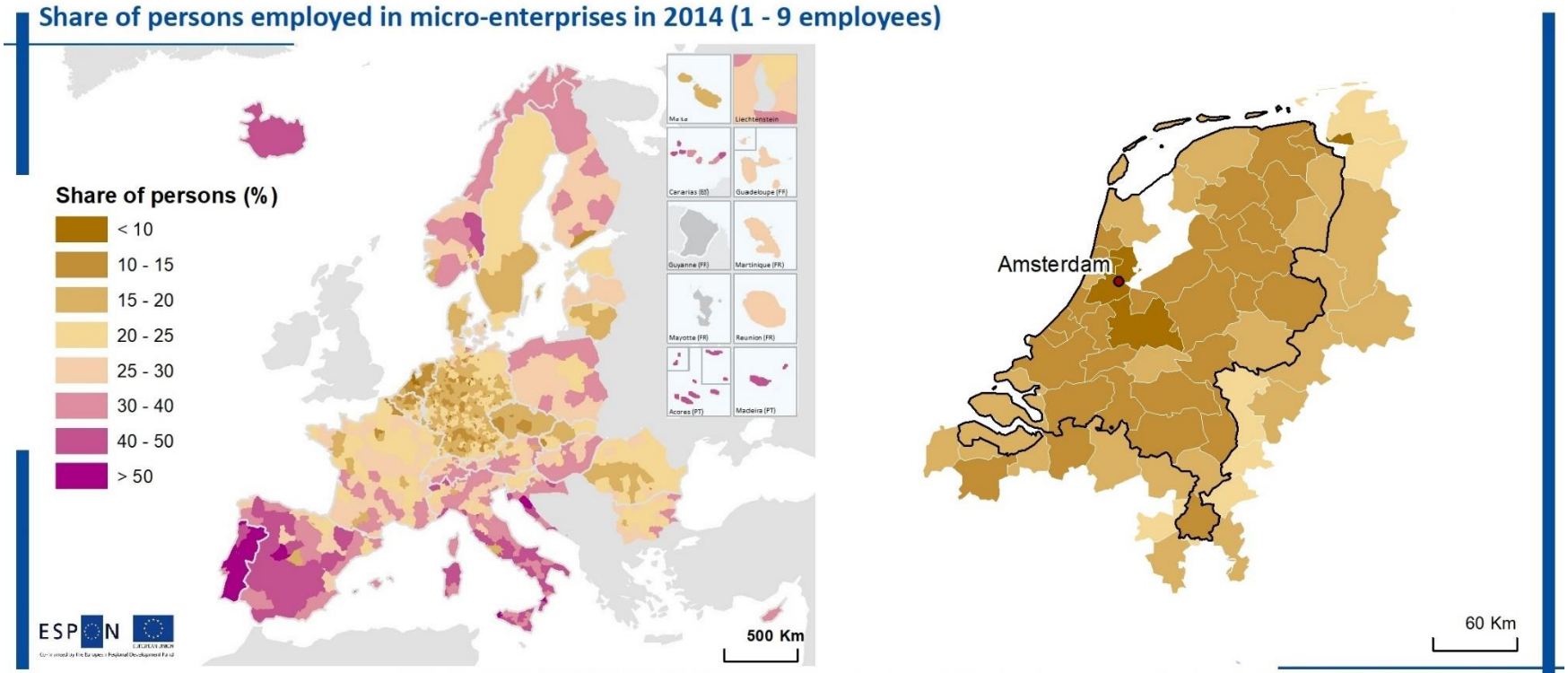


Number of passengers:
Level: Airports
Source: Eurostat, 2020

Accessibility index:
The index is calculated as the average index from the Spiekermann & Wegener study (2014) combining the accessibility by road, rail and air.
Source: ESPON S1W, 2014 I Level: NUTS 3

Accessibility is a precondition for economic development. This is based on the assumption that the attractiveness of a destination increases with its size, and declines with distance, travel time or cost. This map shows the accessibility index of regions by road, rail and air and the total number of travellers in 2018. Highly urbanised regions in central and southwestern Europe have good international travel accessibility and therefore act as gateways to Europe. In contrast, territories with lower density, such as non-capital regions in Central and Eastern Europe and some parts of the Nordic or Meridional states have lower global accessibility.

The map of the Netherlands shows a comparatively high level of global accessibility throughout the country. The highest levels are achieved in Amsterdam region and the south-eastern part of the country which is located close to the highly urbanised Ruhr area in Germany. Thanks to Schiphol airport, Amsterdam is one of the best-connected cities Europe. In the province of Zeeland (in the south-west) and the northern part of the Netherlands the level of accessibility is slightly lower than in the rest of the country. These regions are less urbanised and are further away from major airports.

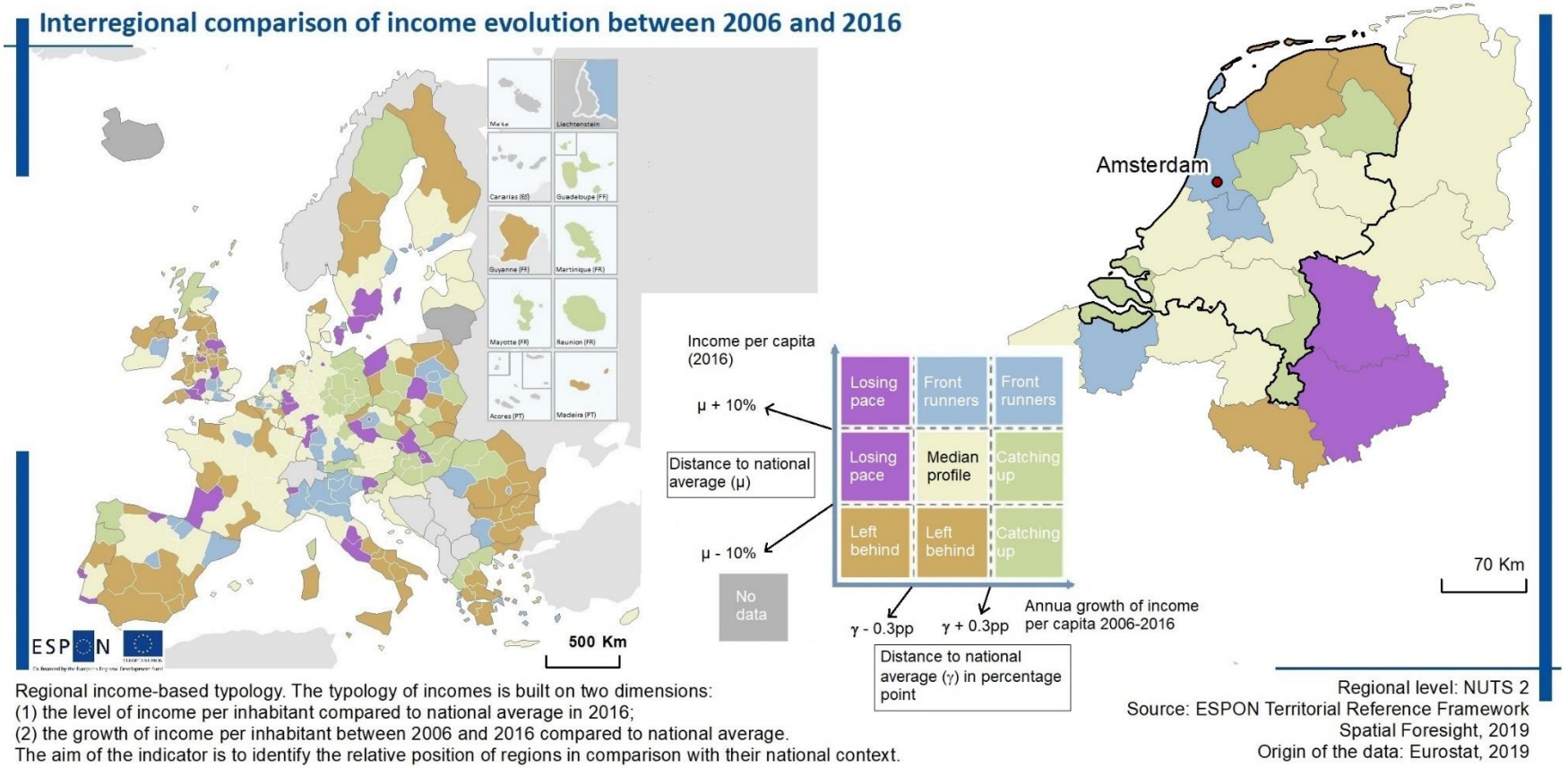


Regional level: NUTS 2 & 3
Source: ESPON SME, 2018

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)

Micro-enterprises are a common part of Europe's employment profile. One-person enterprises or self-employed people are often concentrated in the capital cities or tourist areas. The next step up, enterprises with 1-9 persons employed, show a less urbanised distribution pattern and have the highest rates in the Mediterranean, Norway, Finland, Iceland, parts of UK, Switzerland, Poland, and Hungary. The relative importance of micro-enterprises changed during 2008-2014, with increases in Finland, the Baltic States, Portugal, Spain, the Czech Republic, Bulgaria, and Croatia, while it has decreased in many central parts of Europe. The changes are often associated with the general employment development in a country.

The Netherlands has an extremely low rate of people employed in enterprises with only 1-9 persons. The lowest rate (less than 10 percent, which is among the lowest in Europe) is in the Amsterdam region and the Utrecht region. Most people in these cities work for larger companies or are self-employed. The highest share (between 15 and 20 percent) can be found in peripheral, more rural regions of the country and in a region south of Utrecht. As in other parts of Europe, there seems to be a tendency for rural regions to have higher shares of micro-enterprises than urbanised regions.

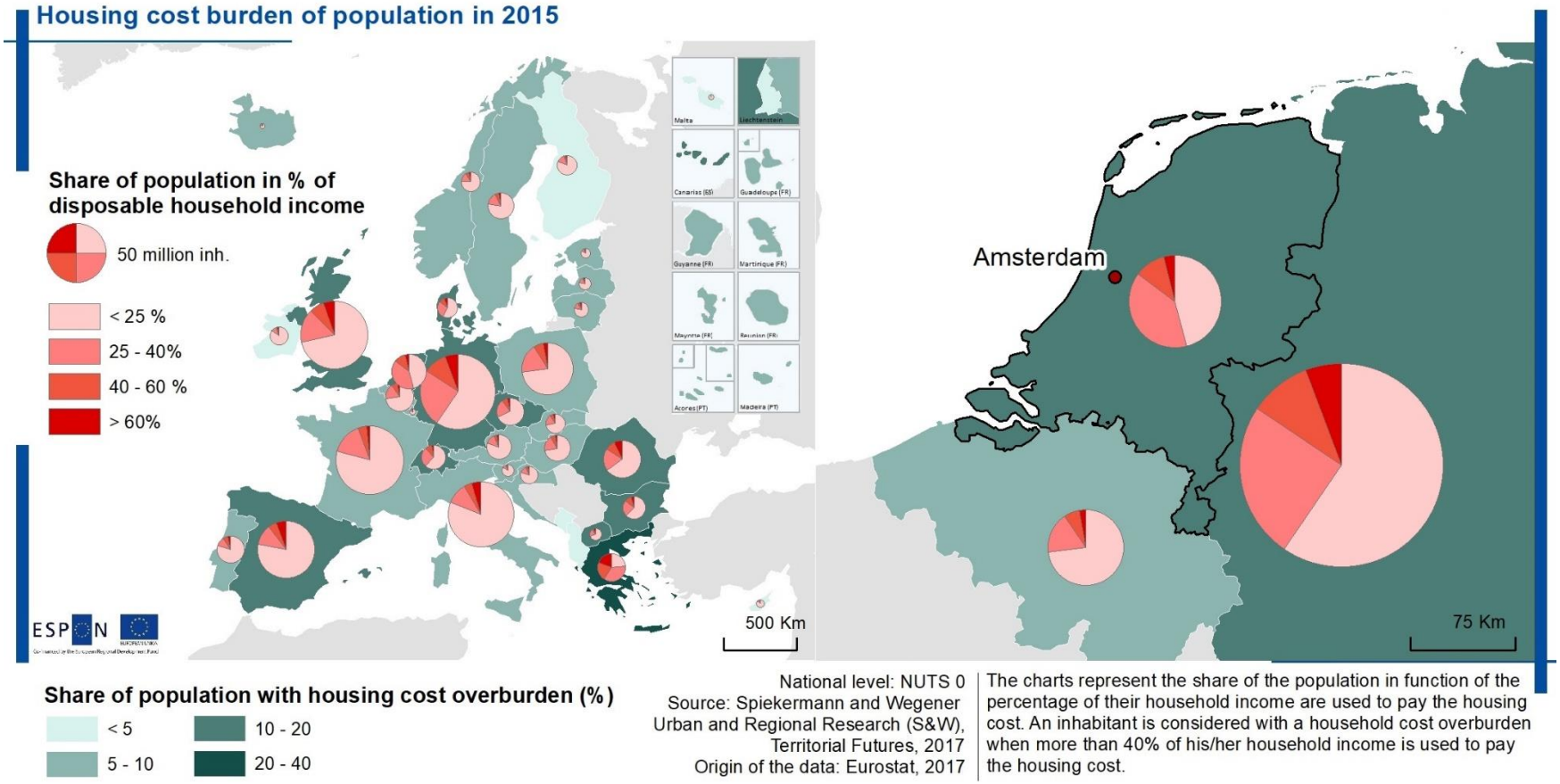


Regional income-based typology. The typology of incomes is built on two dimensions:
(1) the level of income per inhabitant compared to national average in 2016;
(2) the growth of income per inhabitant between 2006 and 2016 compared to national average.
The aim of the indicator is to identify the relative position of regions in comparison with their national context.

Regional level: NUTS 2
Source: ESPON Territorial Reference Framework Spatial Foresight, 2019
Origin of the data: Eurostat, 2019

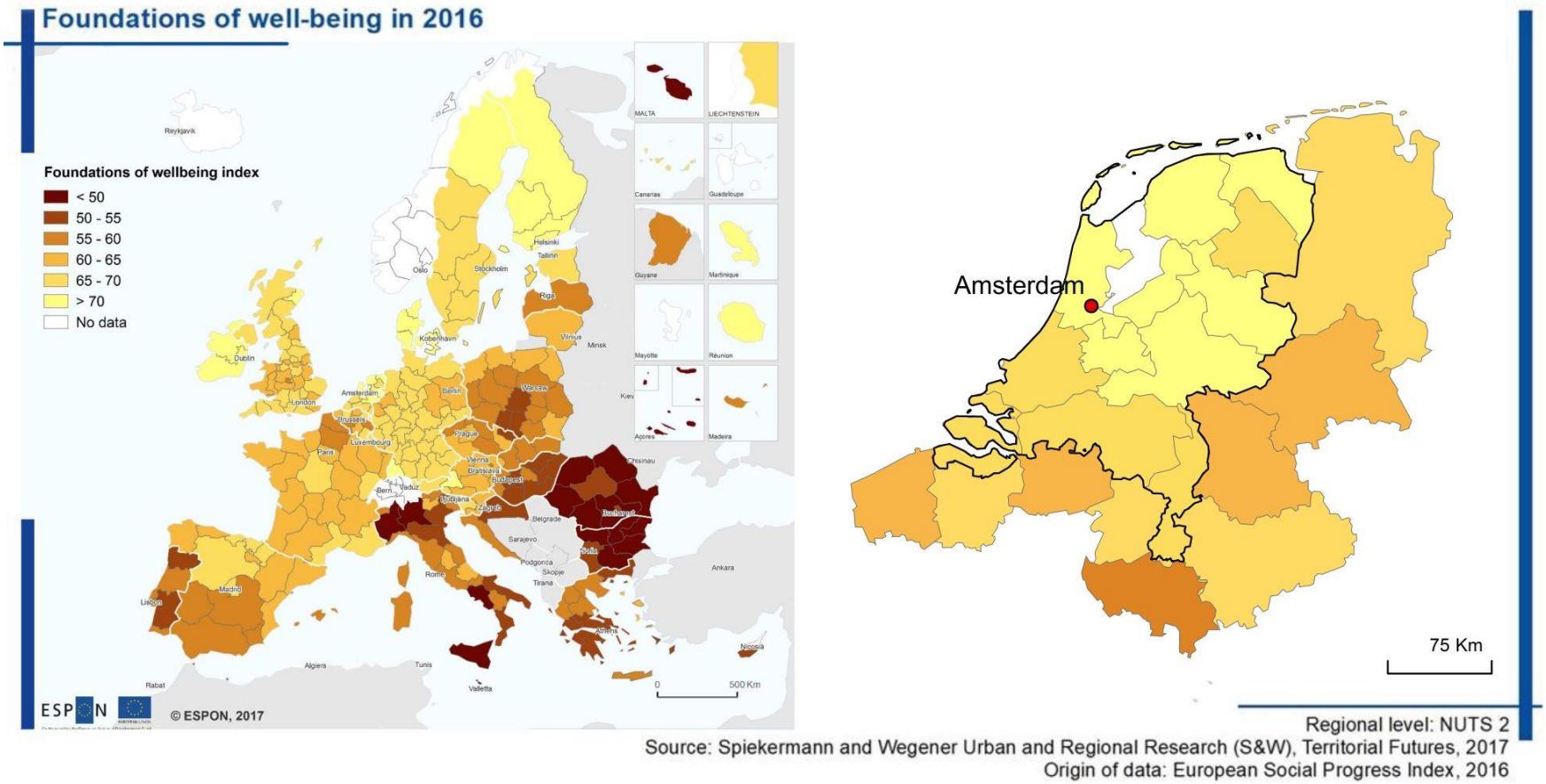
This map indicates relative income as well as income growth per capita during the 2006-2016 period with respect to the national average, not the European average. Southern Germany, Northern Italy, Catalonia, Dublin, London, the Warsaw region, Sofia, and Bucharest are front-runners (high income and high growth within their country), while southeast and southern European regions, together with former industrial regions in France, the United Kingdom, and rural central Europe are left behind (low income, and low growth).

Many regions (in this case provinces) in the Netherlands are relatively stable in terms of their socioeconomic status in the country. However, as with all other European nations, some areas do better than others with respect to the national average. In general, we see signs of divergence between regions in the 2006-2016 period. There are affluent regions becoming even more so (Noord-Holland and Utrecht) and some regions falling behind (Groningen and Friesland) which indicate this. However, there are also two regions that are catching up: Drenthe and Flevoland.



The cost of housing is a major part of household budgets. Increasing shares of housing cost overburden could indicate growing risks of social exclusion or poverty. The map shows Greece, Denmark, the Czech Republic, Germany, the Netherlands, Romania, Bulgaria, Macedonia, Spain, Switzerland, and the UK as countries with the highest share of population with 40% or more of their disposable income being spent on housing.

The Netherlands are among the countries with the highest housing overburden. Given the general affluence of the nation and its high-quality social services, one can ask whether this presents an acute social problem as compared to Greece, Bulgaria, and Romania. However, what is more interesting is to compare the Netherlands with Flanders on this map, which has a lower overburden and around 70% of the population paying only a quarter of their disposable income on housing. This is even more pronounced in Luxemburg (Germany seems to occupy a middle position).



The well-being index is a composite index that describes the quality of life on a regional scale. The map of the well-being index shows significant differences between regions in Europe. In general, regions in Northern Europe show higher levels of well-being than in the south of Europe. The highest level of well-being can be found in Denmark, Ireland, the Netherlands, Finland, and in the northern region of Sweden. Regions with a lower level are situated in Portugal, the north-western and southern parts of Italy, and in Eastern European countries. The lowest levels are found in Italy, Bulgaria and Romania.

The well-being index shows a high level of well-being throughout the Netherlands, with scores above 65 in all Dutch regions and somewhat higher than in neighbouring regions in Germany and Belgium. Within the Netherlands, the northern provinces show a slightly higher index (above 70) than the southern provinces with an index between 65 and 70. However, the regional differences within the country are minor when compared to other parts of Europe.

ESPON EGTC

4 rue Erasme, L-1468 Luxembourg
Phone: +352 20 600 280
Email: info@espon.eu
www.espon.eu

The ESPON EGTC is the Single Beneficiary of the ESPON 2020 Cooperation Programme. The Single Operation within the programme is implemented by the ESPON EGTC and co-financed by the European Regional Development Fund, the EU Member States and the Partner States, Iceland, Liechtenstein, Norway and Switzerland.

Authors: David Evers, Kersten Nabielek, Anton van Hoorn and Tom Goosse

ISBN number: 978-2-919795-51-2

November 2020