



Greening the Future: Policy Options for Greener Cities

Increasing levels of urbanisation are one of the biggest challenges facing Europe. It is expected that 88% of the population of the EU will live in urban areas by 2050. This raises a number of inter-related policy challenges, such as road congestion, sustainability, the environment, well-being, income, housing and accessibility of regions.

While the expansion of urban areas can lead to more jobs, higher incomes and higher standards of living, the negative impacts of urbanisation can lead to increased greenhouse gas emissions, urban sprawl, higher crime levels and destruction of ecosystems. This paper will examine the increasing levels of urbanisation experienced at a European level from 1990 to 2018 and consider what the potential impact will be for Europe in the future (2050). This will have important implications for sustainability, economic prospects, environmental outcomes and quality of life



Introduction: Urban population Rising, Land Use Changing, Cities as Centres for Employment

While 50% of the world's population lived in cities at the beginning of the twenty-first century, it is estimated that by 2050, 66% of the world's population will live in cities (OECD, 2015). Europe is more urbanised with 75% of the population living in cities, compared with a global figure of 55%. The EC's Joint Research Centre predicts that the EU's urban population is set to reach 88% by 2050.

As the urban population grows, land use is changing. In Europe between 1990 and 2006, 1,000 km² of land was converted to be used for housing, roads and industry. Half of this land was artificial land use or was subject to soil sealing. Soil sealing involves the covering of soil with impermeable materials such as concrete to create roads and parking spaces and has several associated negative impacts such as: loss of water retention, flooding, loss of biodiversity and unsustainable living patterns. It is regarded as one of the main factors threatening the state of soil in Europe.

of the population, and businesses concentrated in urban areas benefit from agglomeration economies such as labour market pooling, input sharing and knowledge spill-overs.

High wages, in turn, result in higher costs to firms but are attractive to workers. However, the theory of spatial equilibrium suggests there are advantages to firms in high wage areas which offset the costs of conducting business in cities.

The Spatial Equilibrium: Trade-offs between Commuting Costs and Price of Living Space

According to traditional urban economic theory, cities can be analysed in relation to distance to and from the city centre. Von Thünen (1875) recognised that an interaction exists between space and the economy. The rent for agricultural land was modelled as a function of yield per unit of land and transport costs. Other models were based on the idea that differences in commuting costs are traded off with differences in the price of living space. Such models have aided policy makers in organising places of residence in relation to places of work.

The Impact of Urban Sprawl on Agricultural Land and Ecosystems

Another negative side-effect of urbanisation can be urban sprawl. Planning becomes difficult for polycentric cities where there is a main centre with the highest population density co-existing with other sub-centres. Poor planning can lead to increasing levels of urban sprawl, which makes the provision of utilities, water supply, energy, waste management, and public transport more difficult. The European Environment Agency (EEA) has described urban sprawl as the pattern of low-density expansion of large urban areas into surrounding areas which are mostly agricultural. Increasing urban sprawl means that built-up areas are dispersed over a given landscape but there is low utilisation intensity in the built-up area. Other negative effects include loss of agricultural land, increasing fragmentation, destruction of ecosystems, higher transport costs and increases in greenhouse gas emissions.

Increased Emissions have Serious Health Implications

As city population increases, so too do CO² emissions. Due to the dense nature of cities, and higher population density compared to rural areas, emission density will also be higher. Cities are currently responsible for over two-thirds of energy consumption and more than 70% of CO₂ emissions globally according to the OECD. This can have serious health implications for city dwellers as a result of these higher emissions. In European cities, up to 30% of citizens are exposed to levels of air pollution which exceed EU air quality standards. Given the amount of GHG produced by cities, through transport in particular, sustainable development is required in order to minimise the negative impact of growing cities on the environment.

How to Create Sustainable Cities

The need for environmentally sustainable development is recognised in the UN's 'New Urban Agenda.' Sustainable development will require analysis not only around city size, but also of the changing internal structures of cities. In other words how a city distributes its population and structures across the urban space will determine the sustainability levels of that city.

Some argue however that bigger cities are 'greener', as there is a critical mass which cities reach, making them more efficient at providing public services such as utilities and mass transport. Competing uses for water resources in cities can also improve efficiency and cities can also provide better services in the delivery of health, education and governance.

Despite this, others have demonstrated that people living in cities were 2.3 times more likely to live in an area with pollution, grime or environmental issues compared to rural areas.

Impact on Rural Areas

With decreasing shares of the population living in the countryside, the importance of rural areas would appear to be diminishing, although the current Common Agricultural Policy (CAP) represents 41% of the total EU expenditure. Increasing urban

Country	Rate %
Austria	5.40
Belgium	2.25
Bulgaria	1.78
Cyprus	1.98
Czech Republic	3.71
Germany	2.04
Denmark	1.40
Estonia	5.02
Greece	2.17
Spain	0.53
Finland	3.08
France	4.42
Croatia	4.14
Hungary	3.22
Ireland	5.45
Italy	1.65
Lithuania	5.23
Luxembourg	8.26
Latvia	5.45
Malta	n/a
Netherlands	0.69
Poland	5.23
Portugal	1.38
Romania	3.76
Sweden	2.29
Slovenia	3.83
Slovakia	2.99
United Kingdom	0.92
EU 28	2.55

Table 1: Rate of Urbanisation by EU 28 – 2010-2050

Source: European Commission, Joint Research Centre (JRC) (Lavalle, 2014)

development is of relevance to rural areas as expanding cities place pressures on the demand for agricultural land. There is a belief that smaller cities/towns and rural areas will be the main subject of urbanisation in the future. As cities expand, is it also crucial to have locally produced food. Efficient urban development and more efficient food production will also benefit from lower fragmentation of the land.

Methodology

In this paper, the data on trends in land use and urbanisation across Europe during the period 1990-2018 is examined using CORINE and LUISA data. Given the increasing numbers living in cities and projections that a greater proportion of people will live in cities in the future, this paper will discuss how this should be managed.

To improve life for all citizens, it is important to analyse both past and future trends and to consider how a number of attributes of the land will be impacted by urbanisation.

Table 1 shows the projected annual rate of change in urban population proportions for the EU28 from 2010–2050. Urban land use is expected to increase across all member states with the highest levels in Austria, Estonia, Ireland, Lithuania, Luxembourg, Latvia and Poland. Of the newly joined

EU member states only Cyprus and Bulgaria have rates below the EU average (There is no data available for Malta), whereas established countries such as Germany, Spain, Italy,

Netherlands and the UK have urbanisation rates above the EU average. These are countries which already have high levels of urbanisation.

Figure 1 shows the percentage of built-up areas for 2009 by EU NUTS-2 region. (NUTS is the geocode for referencing subdivisions of the country for statistical purposes)

The map highlights the high degree of urbanisation in Germany, England, Benelux and surrounding major European cities such as Paris, Rome, Turin and Madrid. There are clear disparities across Europe in the urbanisation of areas with a lot of areas relatively un-urbanised. Predominantly rural areas face challenges of accessibility and distance to labour markets. This makes it difficult for them to benefit from the spill over and agglomeration effects of cities and urban areas such as good employment opportunities, higher wages and an overall higher standard of living.

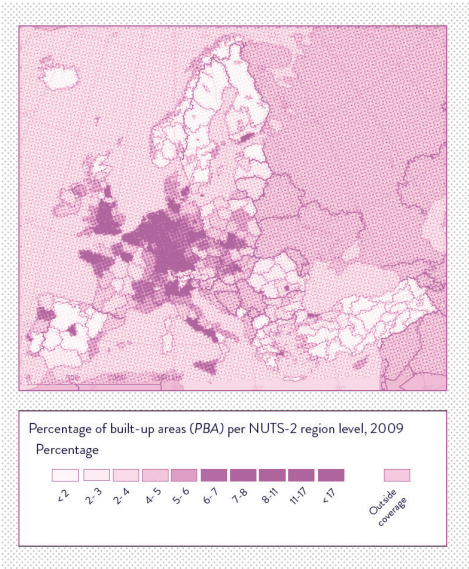


Figure 1: Percentage of built-up areas by NUTS-2 region 2009

Source: (EEA, 2016)

Figure 2 highlights the interconnectivity of EU regions. Regions in mainland Europe clearly benefit from proximity, having the highest levels of accessibility (road and public transport access). This map highlights the areas which are most vulnerable and that have both a low percentage of urban areas and also low accessibility.

Conclusion

An opportunity exists for policy makers at national and European levels to play a key role in adapting to, and driving solutions to climate change. Europe currently faces a number of challenges as a result of urbanisation, and they will become more difficult as levels of urbanisation

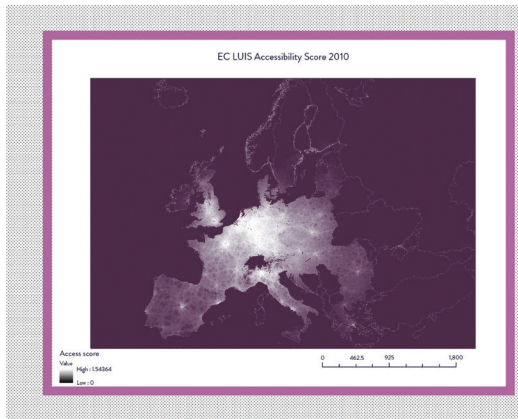


Figure 2: EC LUIS Accessibility Score 2010 - White areas indicate high connectivity
Source data: European Commission, Joint Research Centre (JRC) (Lavalle, 2014)

increase in the future. Among these challenges are traffic congestion, lack of affordable housing and pollution, which impact on public health, well-being, sustainability and quality of life. These challenges are interconnected and improvement in one will impact on the

others. Approaching urbanisation from the perspective of balanced land use creating supply chains for locally produced food, and intensification of the core of cities to provide for affordable housing and more

green spaces could lead to the creation of sustainable, resilient and carbon neutral cities in the future.

Recommendations

1. Reduction of Carbon Emissions by Generating Locally Supplied Food and by Carbon Sequestration through Forestry

Increasing levels of carbon are a problem for every global citizen and the current rising levels of greenhouse gas emissions are unsustainable. Expanding cities will lead to increased levels of consumption. The CAP can play an important role in reducing these overall levels by generating a local supply of food (lowering transport costs by minimising distance from producer to consumer), but also by increasing the levels of carbon sequestration through forestry.

2. Protection of Green Spaces in Urban Planning

Urban Planning can also play a role in the protection of green areas and public spaces in our cities which give residents recreation value and reduced air pollution. Urban sprawl tends to replace public spaces with private space.

3. Creation of the Prerequisites for Sustainable Transport

Policy makers in Europe will have to ensure that cities are attractive places in which to live and work. Less reliance on cars as a mode of transport and more investment in sustainable methods such as walking, cycling and public transport will help to improve congestion levels. The deployment of public transport will, of course, depend on the initial urban development and that there are sufficient numbers of commuters to make it viable.

4. Management of the Sustainable Development of Cities

Policy makers may also wish to consider whether some form of city/urban directives are required at a European level to ensure that the expansion of our cities is controlled in a sustainable fashion. There is currently an overarching link across a number of existing portfolios that deal with climate change, transport, jobs, education and regional policy. The responsibility for such areas will have to be managed efficiently to ensure sustainable development in cities and provide examples of best practice on how to manage development.

5. Development of Inner Core of Cities to Counteract Urban Sprawl

Policies could be developed to incentivise urban core development and living, redevelopment and densification of brown field sites help to reduce levels of urban sprawl.

6. Collection of more Data on the Socio-Economic Impact of Urbanisation

Data that examines land use and urbanisation could be enhanced by harvesting more data on socio-economic factors at the local level such as well-being, income, and house prices to name a few. That would give us more insight into the change in the levels of urbanisation. Models such as Von Thunen and Alonso are still relevant today as individuals trade off housing needs, income and transport costs during their decision making process. Land use is a part of this, however detailed information on the other components is lacking.

7. Coordination at National Level between Government Departments

All government departments should work in an integrated fashion to enable the urban transition to take place in a climate-friendly manner. This should ensure that there are consistencies in overall strategies, for example the construction of motorways is shown to increase urban sprawl reducing sustainability of cities. It will be important to not only consider economic outcomes but also environmental consequences and impacts on individual well-being.

8. Strategic Approach to Policy Making

Every strategy and every policy and financing mechanism should be future-proofed to be compatible with achieving the 1.5°C degree goal of reducing climate emissions.

Paul Kilgariff is a Post-Doctoral Researcher in the Luxembourg Institute of Socio-Economic Research, where he focuses on the area of spatial analysis and urban studies.

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