

## **JPI Urban Europe – Urban Megatrends Study**

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### **1 ABSTRACT**

For a research initiative, such as JPI Urban Europe (<http://www.jpi-urbaneurope.eu>), analysing the long term trends for urban development is crucial for the strategic focus of the programme. An Urban Megatrend study aims at providing the basis for the integrated, multidisciplinary urban research with a time horizon of 2050+ of JPI Urban Europe.

Global megatrends can be observed in cities in distinct ways depending on the characteristics of urban areas. Therefore, a multi-scale analysis of these trends has been conducted. The megatrend categories to be identified are: demographic evolution, climate change and environmental state, science and technology, economic dynamics, built environment and infrastructure and last but not least social-cultural issues. From these categories, a wide set of challenges for urban areas has been derived.

Beside a detailed data-based study, an intensive consultation and workprocess with experts and national representatives in workshops aimed and will aim at generating a differentiated picture of the urban development across Europe.

The Urban Megatrend Project will be completed in May 2013. Thus, final conclusions can be presented at the conference. This paper summarises our preliminary findings after two workshops and aims at giving an outlook on further research which is going to be conducted.

### **2 INTRODUCTION**

#### **2.1 What is the Joint Programming Initiative (JPI) Urban Europe?**

The Joint Programming Initiatives (JPIs) are transnational research and innovation initiative introduced by the European Commission. The aim is to pool national resources in creating transnational R&D programmes with focus on grand challenges which cannot be solved on level of individual countries. With increasing urbanisation, cities are more and more put in the focus for a variety of reasons and by diverse disciplines. Therefore, JPI Urban Europe is striving to establish a large scale, long term, multidisciplinary and transnational research and development programme dedicated to urban development. JPI Urban Europe has been accepted as one of ten Joint Programming Initiatives.

#### **2.2 Relevance of Urban Megatrends in JPI Urban Europe**

Urban Areas across Europe are going to be faced with a number of challenges in the decades to come. As JPI Urban Europe is currently in its pilot phase, analysing urban megatrends is a central building stone for the strategic direction. The aim of this study has been to identify the trends, to analyse the interdependencies, to create a differentiated picture of the expected development path of cities across Europe and to identify the challenges resulting from the developments. Therefore, a multi-scale analysis, from global to local, has been undertaken.

Although the a majority of urban challenges result from global megatrends, the occurrence and effects on the local scale are very diverse depending on the geographical properties, the governance system with respect to urban planning and development, historical trends and economic performance. Thus, for a multinational long term initiative such as JPI Urban Europe it is essential to analyse the prospects and foreseeing possible trends and challenges on various scales to get a differentiated picture of the urban areas across Europe. The findings of this study are significantly influencing the Strategic Research Agenda of the JPI Urban Europe. Furthermore, in the short term, this study contributes to concrete call topics and to identify the immediate research needs. A comprehensive and differentiated study on urban megatrends and on the resulting challenges is a central building stone for the future strategic orientation of the Joint Programming Initiative.

### 3 METHODOLOGY

The methodology of the study is based on a multi-tire process. Desk research of available literature and exploration of existing foresight documents relevant assessing on urban megatrends provide the basis for further research. Therefore, scientific papers and national planning and development related documents with various thematic views, geographical scopes and time horizons were analysed. Cross linkages between and the integrative view upon the documents is ensuring a holistic analyses.

Representatives and experts from several countries participated in the in-depth research and analyses on national perspectives: Austria, Belgium, Denmark, Finland, France, Italy and the Netherlands. Thus, countries participating in the investigation are geographically distributed throughout Europe which aims at generating an all-inclusive view on the situation in 2050.

A quantitative analysis has been conducted for countries across Europe looking upon developments in demography, climate, social structure and economy. On basis of NUTS 3 regions, regionalised data on European urban regions regarding long-term trends of climate exposure, demographic and socio-economic development have been explored as a European wide data-driven backbone on the major trends.

### 4 MEGATRENDS AND CHALLENGES AT DIFFERENT SCALES

The study analyses urban megatrends at different scales: the global, the European and the national scale. Although global trends and geopolitical shifts are affecting countries across Europe, the occurrence, and thus the challenges stemming from the trends are diverse and depending on the circumstances in the countries and cities.

The data analysis illustrates a European wide image of trends and challenges influencing urban areas in the coming decades. Therefore, all urban regions with an urban population above 250,000 inhabitants within the functional urban areas have been taken into account. In total, 148 city regions were integrated into the analyses according to megatrends in demography, social structure and economy and climate. Data from EUROSTAT, as a baseline data, and projection data from IIASA (demography), the University Paris 1 (economy), the University of Edinburgh (land use) and from AIT (intraregional distribution in the urban regions) carried out within the PLUREL project (dealing with periurban land use relationships – [www.plurel.net](http://www.plurel.net)) and further ESPON projects (particularly ESPON climate as well as ESPON FOCI) have been applied for these analyses. The results clearly show that the megatrends manifest differently in space. In the study, two scenarios based on the PLUREL framework, which have been adapted from IPCC, were considered. Due to the limitation of this paper, only the highlights of the findings can be mentioned here.

#### 4.1 Demography

Most urban areas are going to face a significant change in the demographic composition in the decades to come. Until 2025, while the majority of western European cities are expected to gain in population, especially the Central-Eastern parts of Europe are going to lose population which results in diverse challenges. While an aging society is going to influence urban areas across Europe, Central-Eastern and Eastern Europe are going to suffer even more by continuous out-migration driven by local economic decline. Therefore, this trend is amplified in the region.

In the contrary, urban areas with growing population are less prone from massive aging since the majority of people moving to urban areas are younger ones. Figure 1 shows the detailed expected population change in urban areas until 2025. The graphic is based on the scenario for moderate economic development. The demographic development of European cities is expected to influence the appearance and structure of urban areas significantly. Urban design, urban infrastructure and service provision have to be adapted to the needs of an aging society. Shrinking cities are going to be faced with a wide range of challenges. At the same time growing cities, especially in the European Pentagon (as suggested by ESPON), are challenged by demographic developments influencing the social composition in space as well as the built environment.

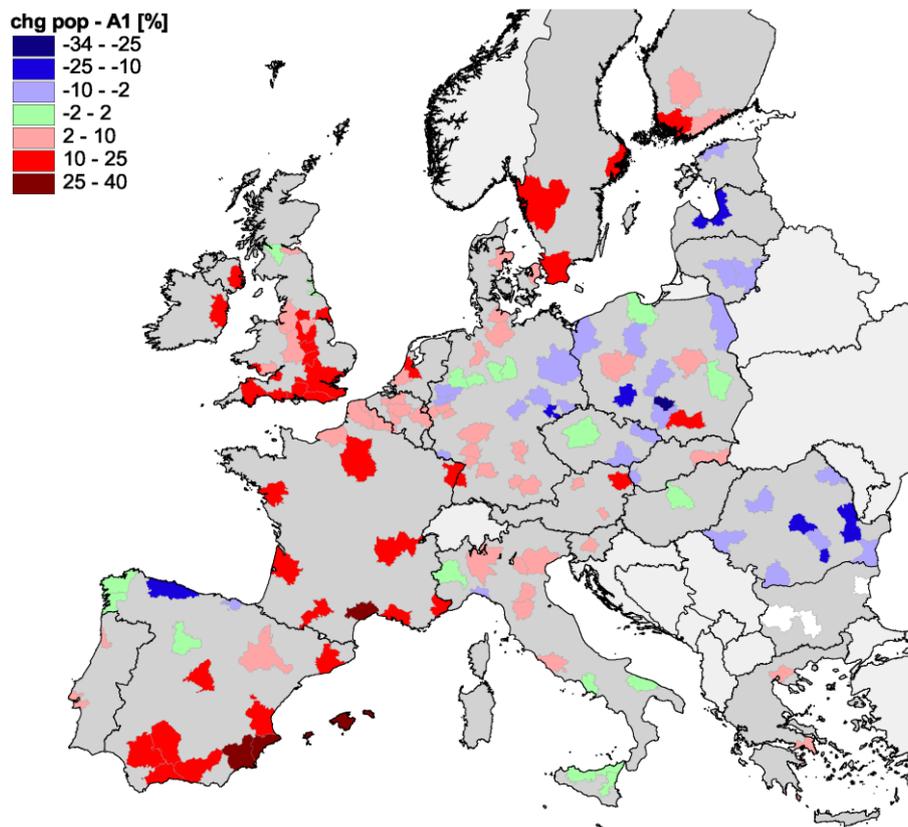


Figure 1: expected population change 2025. Data source: PLUREL project 2007-2010, scenarios A1. Population projections: IIASA, GDP projections: Univ. Paris, Nuts2 to NUTS3 disaggregation: AIT

#### 4.2 Social-Cultural Issues

Due to the roll back of the welfare state and increased polarisation, social cohesion is expected remain under pressure. Thus, the willingness for solidarity and the further distribution of wealth are endangered. Especially, under the circumstances of an aging society with more retired and thus low income people, this issue is of high relevance. Within the urban regions, as well within entire Europe, the increasing economic polarisation results in higher spatial segregation at the local – as well as the supra-regional scale.

#### 4.3 Economic Dynamics, and the Role of Science and Technology

Throughout Europe, a lack of qualified labour is expected. Due to the demographic dynamics, like the aging society, the workforce is decreasing. In 2050, due to global competition and the uprising BRIC and other Asian countries, the role European cities play in global competition is expected to be changed significantly. Service, high tech and innovative industries are expected to be of great importance for continuous growth in Europe.

Innovation, science and technology are seen as future opportunity for Europe. On the one hand it could significantly increase the sustainable development of cities, and thus contribute to the liveability of urban areas; on the other hand urban technologies bear great opportunities for economic growth. What is needed for a sufficient and successful implementation is the acceptance by the citizens. Furthermore, science and technology has to act and react to the social needs of the people. In the decades to come, the economic situation of and the quality of life in European cities are going to be highly dependent on developments in innovation, science and technology.

#### 4.4 Natural Environment and Climate Change

Climate change is going to influence urban development in differentiated ways until 2050. Coastal urban areas will be affected by storm surges and have to adapt their infrastructure and built environments accordingly. Furthermore, extreme rainfall events with higher frequency and magnitude will be more likely causing river flooding affecting smaller cities by local events more frequently than larger ones by big events. Cities in the Mediterranean region and on the Balkans are going to face significant changes in the number heat days ( $T_{max} > 25^{\circ}\text{C}$ ) and tropical nights ( $T_{min} > 20^{\circ}\text{C}$ ) which can be severe if longer heat episodes will

occur. It is expected that the climate exposure in these regions is going to shift substantially and will affect more the older and ill population. Cities in Central-Eastern Europe observing a continental climate will suffer from more frequent and longer heat day episodes – the climate properties will change to those in near and far South-Eastern Europe. Cities in Southern Europe are expected to suffer from temperatures currently observed along the African and Middle-East Mediterranean Coast. Urban Heat Island effects (lack of nocturnal cooling, lack of open space climate comfort, lack of cooling and ventilation in street canyons and apartments) will turn out to be growing issues. Cities in the Alpine areas will be less, Scandinavian and Baltic cities will be far less exposed by these trends.

## 5 FIRST CONCLUSIONS AND OUTLOOK

In the first part prospection exercise, the urban megatrends and stemming challenges have been identified by experts and committed by representatives of the participating countries. Based on data analyses, and the review of local studies a distinguished picture of the trends of urban space could be developed for the European scale. The multi-scale analyses depicts heterogeneous challenges for urban areas until 2050 across Europe regarding the megatrends in demography, social-cultural issues, economic dynamics, built environment and infrastructure, science and technology and natural environment and climate change.

The study is expected to be finalised in April/May 2013. The findings and storylines are going to be discussed with experts, stakeholders and city practitioners in order to draw robust conclusions how to proceed. By challenging the results with experts from various fields the scope of the study will be ensured and underlined. At the conference we will present the final storylines for urban development upon 2050 regarding the identified megatrends and challenges and draw conclusions for JPI Urban Europe.

This integrated and multidisciplinary study is providing essential input for the strategic research agenda of JPI Urban Europe is gaining in profile for a long term research and innovation initiative. Furthermore, in the short run, topics for research calls and for immediate actions are identified.

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