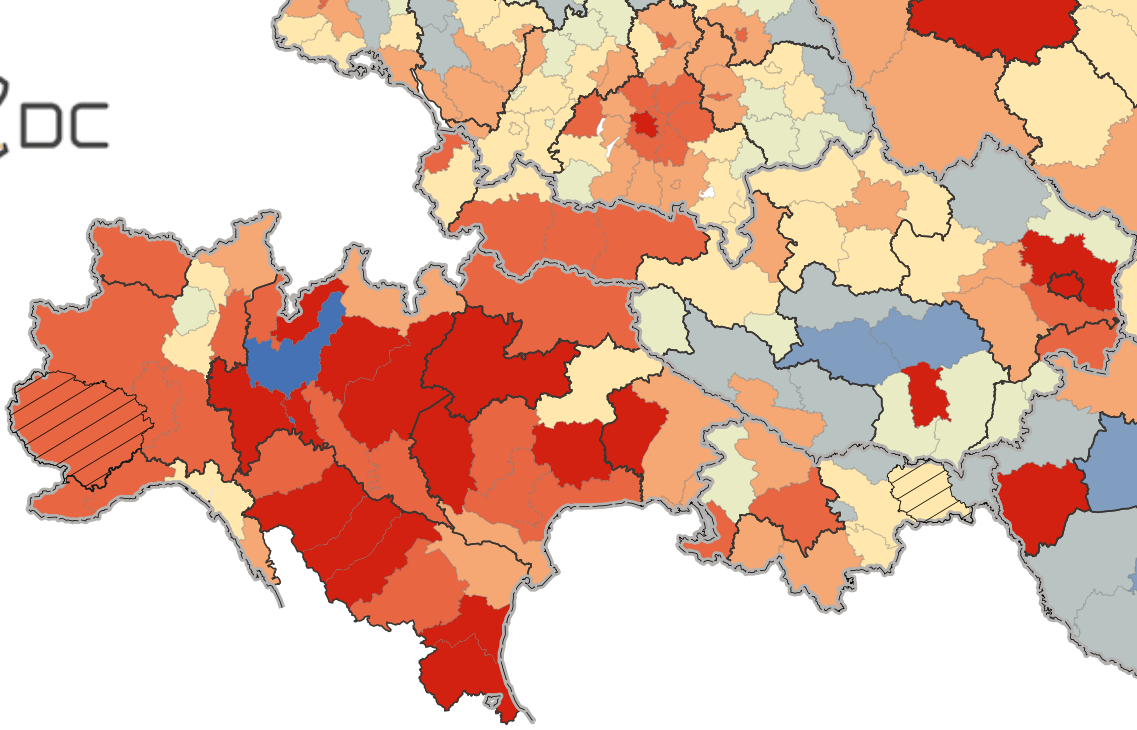
ADAPT2DC



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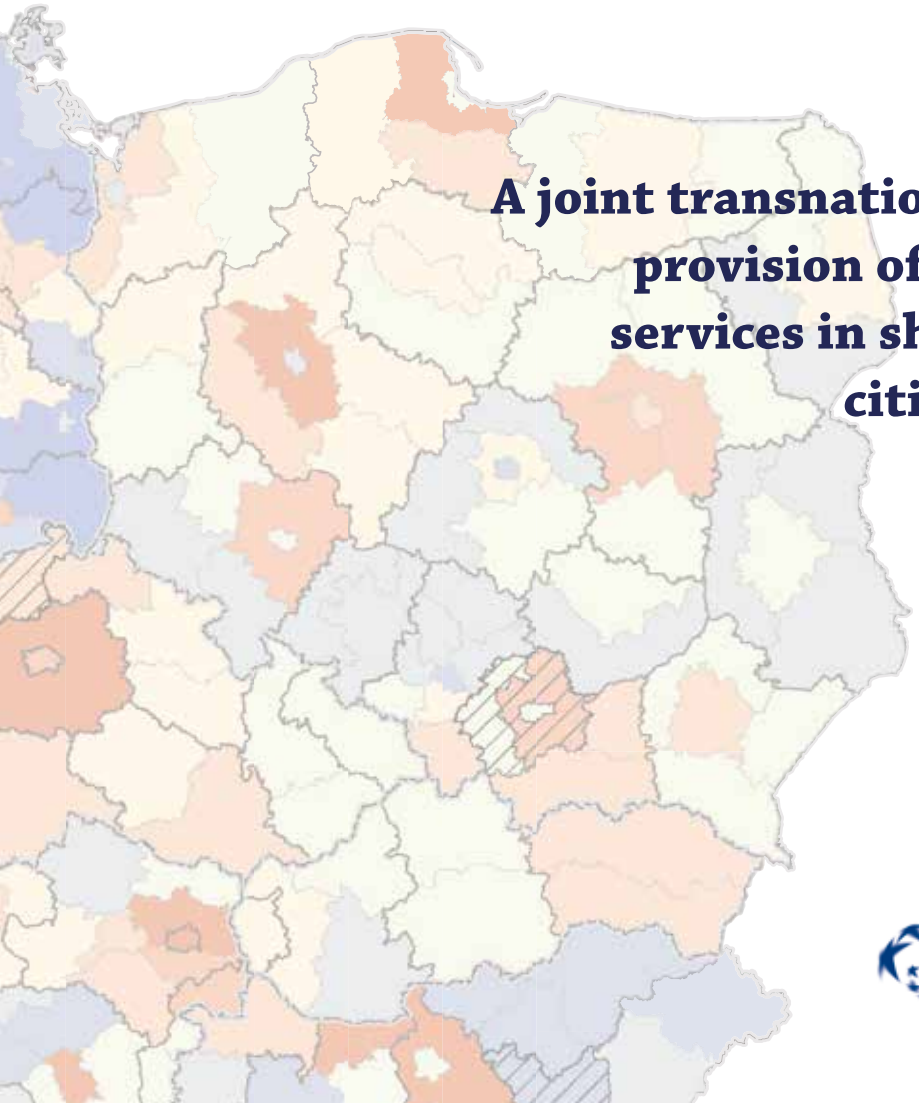

A joint transnational vision for future provision of infrastructures and services in shrinking regions and cities of Central Europe

Output 3.3.5

CENTRAL EUROPE
COOPERATING FOR SUCCESS.
EUROPEAN UNION
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A joint transnational vision for future provision of infrastructures and services in shrinking regions and cities of Central Europe

Revision: Final

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Contents

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1 Introduction

On the EU-level, policies and strategies have already been developed in order to cope with demographic change[1] (chapter 2). Nevertheless the project team of ADAPT2DC is convinced that it is necessary to develop further policies and recommendations, especially highlighting the consequences demographic change will have for the provision, management and financing of public infrastructures and services in shrinking regions and cities in Central European (CE) regions and countries. The existence of fundamental infrastructures and services such as roads, a functioning public transport system, day-care services for the elderly or doctors are decisive when it comes to retaining and/or attracting residents to regions and cities. With shrinking population fewer and fewer people have to finance the provision and management of such infrastructures. Therefore it is important to intensify and promote thinking about innovative ways of providing, managing and financing infrastructures and services also under shrinking conditions. In this Position Paper we start with a brief summary of the findings we have gained thus far in the project that highlight key challenges (Central) Europe already faces or will face in the coming years due to processes of demographic change (chapter 2.1). We will also refer to other studies that have been dealing with the challenges and consequences demographic change means/will mean for the European Union and its inhabitants (chapter 2.2). We will summarise the cross analysis report which helps to better understand changes in infrastructure and service costs in relation to demographic change (chapter 2.3). We will then bundle identified needs and challenges in the pilot regions of the project for different infrastructure areas, bringing together the regional and transnational perspective (chapter 3). Then we will take a look into the future regarding the provision with infrastructures, applying a regional, national and transnational perspective (chapter 4). Finally, we will present general recommendations for the handling of demographic change through policies (chapter 5.1) and give specific recommendations for various infrastructure areas (chapter 5.2).

This Position Paper is the basis for the development of a European Transnational Strategy (WP 5) within the project for tackling the consequences demographic processes will have for the provision and financing of public infrastructures and services.

1 In the project we apply the term "demographic change" in a rather narrow sense. Some aspects of demographic change such as intergenerational relations are not considered.

2 Key challenges across (Central) Europe

Most of the policies related to demographic change are developed by the member states of the European Union. However, the EU has formulated strategic aims regarding its demographic development and its appropriate handling. This is especially expressed in five central strategic documents:

1. *Lisbon Strategy* (2000)
2. *Europe 2020 Strategy* (2010, succession programme of the Lisbon Strategy)
3. *Leipzig Charter on Sustainable European Cities* (2007)
4. *Green Paper: Confronting demographic change. A new solidarity between the generations* (2005)
5. *The Demographic Future of Europe - From Challenge to Opportunity* (2006)

One of the main reasons for the EU's increasing focus on demographic change can be seen in the predicted fall of economic productivity due to rising welfare costs and a possible labour shortage (Gerőházi et al. 2011).

The *Green Paper* (2005) emphasises that demographic change should be treated as a development that will influence and change the entire European Union. It bundles several challenges that should be addressed in order to cope with the consequences of demographic change:

- Reach greater employment participation of young people, women and older people who want to enter the labour market
- Generate productivity growth through economic reforms, research and innovation
- Introduce incentives to raise fertility levels
- Stimulate outside immigration and integration
- Develop a global approach to the working life cycle: Younger people might want to work less and stay more with their children, while they might want to work more later on
- Build more flexible bridges between work and retirement (Commission of the European Communities 2005: 1–12).

In its document *The Demographic Future of Europe* (2006) the European Commission stresses that current policies are not viable in the long term, as they do not sufficiently address the expected decrease in the active population as well as shrinking public finances. It sees the source of the problem not in higher life expectancy (which is evaluated positively), but rather in the inability of current existing policies to adapt to the expected demographic developments. In this respect, in this document the Commission develops a reference framework at Community level for Member States' policies since both national and supranational policies need to be attuned to the challenges that result from demographic change. The Commission especially highlights five areas as key targets of action:

- Support families;
- Promote employment;
- Introduce reforms for better productivity and economic performance;
- Promote immigration and secure integration of migrants;
- Develop sustainable public finances (Commission of the European Communities 2006: 12–14).

Also the issues of natural population development and pension systems are part of and/or closely related to demographic change. Although combating the consequences that result from demographic change falls into national competency, some attempts have been made also by the EU to influence fertility levels and to make sure that pension systems function adequately. These attempts are mostly restricted to general recommendations, and directives are mostly aimed at either ensuring a minimal level of benefits (e.g. extension of maternity leave)[1] or making sure that pension funds will not be cut.

1 The European Parliament had been adopting a directive in 2010 about the extension of maternity leave from 14 to 20 weeks. Since this decision will result in higher costs, the Council has rejected this directive and it could not come into effect.

Although the EU does not influence the particular set-up of the pension systems in its Member States, the Economic and Social Committee (2001) suggested using the open coordination method to establish common objectives and indicators across its Member States. The three objectives behind this suggestion were obtaining the adequacy of pensions, ensuring the sustainability of private and public funds and modernising pension schemes. In 2007 the Committee then issued a general statement on the budgetary impact of ageing populations. It underlined the importance of proper pension systems for future generations, saying that supplementary pensions, if required, must be reliable, secure and shielded from unforeseeable developments on the financial markets. It also stressed that the evasion of tax and social security contributions in some countries endangers the reliability of pension systems, and, as a result, strict measures should be introduced. Furthermore the EU regulates the pan-European pension market through consecutive directives, making sure that citizens of EU Member States enjoy both their state and occupational pensions regardless of whether they live in the same country where they accumulated these funds (Gerőházi et al. 2011).

2.1 Main results from the socio-economic background report (SEB) (Action 3.1)[2]

The socio-economic background report (SEB) is focused on understanding population shrinkage processes as part of demographic change in Central European regions. The analysis is provided at NUTS 3 instead of NUTS 2 level, which allows perceiving processes of demographic change to be spatially more detailed.

The main conclusions drawn from the SEB regarding current and future challenges are the following: the effects of demographic change such as population ageing and population shrinkage will become even more relevant in the next ten years. Therefore it is necessary to have (or develop) adequate strategies and policy tools for adapting the provision, management and financing of public infrastructures and services to demographic change, since it means fewer people living in an area, changing demands of the population and shrinking public funds for the provision of infrastructures and services. It is expected that there will be fewer regions with a growing population. Conversely, there will be more regions affected by population ageing and more regions affected by simultaneous population ageing and population shrinking.[3]

Population ageing is widespread in almost all regions in Central Europe (except northern Italy with an already aged population and high immigration of younger generations). This also means that regions which currently have a younger population will experience faster population ageing in the next few decades. Inherited population structures as reflected in fertility and mortality rates and growing life expectancy in the regions will contribute to further population ageing.

Population shrinkage is more spatially selective than population ageing: at the Central European level there is a concentrated macro-regional space of population growth from northern Italy to western Austria to southern Germany. National metropolises and several second-rate metropolitan areas also show population growth (e.g. the Graz region, Innsbruck region). The remaining non-metropolitan areas have a stable population or are experiencing population shrinkage. This interpretation of population development is considered a broad generalisation to which there are several exceptions. Firstly, the cores of some metropolitan regions are experiencing population shrinkage because there is a trend towards metropolisation and population de-concentration from urban cores to wider metropolitan areas (e.g. Prague, Warsaw, Budapest). Secondly, metropolitan regions not only compete for labour force (e.g. ICT and similar business) with other regions in the country but also with metropolitan regions in other countries. Therefore, smaller metropolitan regions or economically less successful metropolitan regions may also experience population decline. Thirdly, not all rural regions show similar population development, due to varying demographic structures and inherited infrastructures. Contemporary population developments are

2 Chapter 2.1 was provided by ISCAS, author of the SEB report (Šimon, Mikešová 2013).
3 In the project, population shrinkage is understood as the relative decline of the total population size within a region in a ten-year period. Regions with a total population decline are therefore considered shrinking regions.

shaped among others by the changing economy, the environmental qualities of regions and the accessibility to metropolitan areas. However, in principle, sparsely populated rural areas are more vulnerable to population shrinkage because of their generally lower population density than urban and metropolitan regions.
Total fertility rates are low in all Central European regions and it is unlikely that they will approach replacement level in the near future (2.1 children per woman). This development indicates the future course of population shrinkage due to natural change.

The analysis of the current values of old age dependency ratio and its development reveals large differences between countries. Demographic ageing measured by growth of mean age is widespread in Central Europe; thus the economic burden on working-age populations will probably grow. The analysis of the current young age dependency ratio and its development reveals the continuing decline in the number of young people in most regions in Central Europe with the exception of northern Italy and some metropolitan regions. As projected for 2030, the regional dimension of population change shows a prevalence of shrinking over growing regions in Central Europe. Only the metropolitan hinterlands of metropolitan cores and rural regions with currently younger population structures show growing demographic trends.

The described developments (population shrinkage, ageing) in Central European regions will pose several challenges regarding financing public infrastructures and services, maintaining intergenerational solidarity, adapting the pension systems to the changing population structures, guaranteeing the accessibility and availability of services and infrastructures, especially services targeting specific age groups such as schools or day-care services.

2.2 Main results of similar studies

For this Position Paper other studies have been analysed in order to identify further challenges that are also important to consider when it comes to adapting public infrastructures and services to demographic change. Besides demographic change, ageing and shrinkage further challenges come to the fore in addition to migration and the financial crisis that might hinder the necessary adaptation processes. Although all cited studies and projects mainly focus on urban areas, they are closely connected to their surrounding (rural) regions. Moreover, the communes are increasingly overstrained by adapting their infrastructures alone to demographic change. Regional cooperation and thinking is necessary for the development of sustainable adaptation modes. That is why we think the results of these studies will be valuable for the ADAPT2DC project, which deals with shrinking regions **and** cities:

ESPON: SeGI (Main Report, 01/2013 + Constantin, Grosu, Iosif 2013)

The future developments of European territories will be influenced by **external** (climate, demographic change) and **internal** (ideological positions of member states regarding infrastructure provision) **challenges**. Especially economically and demographically disadvantaged regions face the risk of becoming even more disadvantaged as a consequence of the **budget cut-backs needed to manage the financial crisis**. This would violate the policy ambitions of economic, social and territorial cohesion as the gap between rich and poor regions can be expected to increase. Therefore one challenge is the extent to which regional policies in support of social cohesion are effective given the significance of the national context. Regarding the provision with (social) infrastructures and services (here called social services of general interest - SSGI)[4] the project highlights various challenges in three different areas:

4 The project mainly refers to social services since they are exempted from the competition and single market rules of the EU. In this respect the project refers to the education, (health) care, labour market, social housing and insurance schemes.

1. territorial capital:
   – clear concentration tendencies in remote, sparsely populated, mountainous regions towards major towns and cities;

   – agglomerations creating imbalances in SSGI provision;
   – low or lack of SSGI provision in less attractive territories from a market perspective;
   – peripheral, sparsely populated regions experiencing population decline often face significant problems in maintaining or financing service standards

2. global competition:
   – significant cut-backs in the provision of SSGI, not only in already disadvantaged regions, but in all regions as a result of the global economic crisis
   – structural crises and economic change impacting on the provision of SSGI

3. policy on territorial cohesion:
   – centralisation of services
   – ongoing economic and financial crisis as well as the deregulatory and liberalisation processes
   – reduction of investments in SSGI in Europe due to the economic crisis
   – poorly professionalised bureaucracy and frequent changes in the law negatively impacting the provision of SSGI

ESPON: Demifer – Demographic and Migratory Flows affecting European Regions and Cities (2008–2010, Final Report 2010)

The Demifer project developed a typology of seven regions, especially regions with population decline (1 + 2) and disparities (3 + 4) face challenges:

(1) *Challenge of Labour Force* type + (2) *Challenge of Decline* type feature a negative natural population development (1) and a negative migratory balance (2). Both lead to depopulation accompanied by demographic ageing.

(3) *Challenge of Ageing* type + (4) *Young Potentials* type constitute demographic growth regions with above average GDP-PPP per capita and average labour force participation; strong net migration gains and population increases. However, the labour force in these regions is over-represented by low-qualified, low-wage sectors such as agriculture, hotels, construction and tourism (3). The challenge is to create better, higher-qualified jobs in the regions.

Key challenges in declining regions concern the (1) low fertility level which leads to a decline in the growth of the working age population. Policies aiming to raise the level of fertility will not be effective if the general economic situation will not improve. Furthermore the (2) different life expectancy in the regions is related to lifestyle factors. (3) Massive streams of migrants may cause social problems as the current cultural abilities to integrate migrants are inappropriate.

Interreg IV C: DART (Final Report 2012)

The project explored the challenges specific European study areas will be facing in relation to population decline, ageing and regional transformation. Here, specific **regional strategies** have to be developed. Those **should not only be limited to demographic change**, but also consider at least four areas of intervention:

(a) Health Care, with an overall objective of improving general health conditions in the region

(b) Social services, with an overall objective of increasing social cohesion in the region

(c) Education/labour market, with an overall objective of increasing the employment rate, improving the quality of education

(d) Economy, with an overall objective of increasing the economic competitiveness through more innovation and technology transfer

FP 7: Shrink Smart (Research Brief No. 2, 2012)

The project highlighted the **challenges that result from urban shrinkage** in general:

- declining population densities
- growing imbalance between the supply of and demand for housing
- growing imbalance between the supply of and demand for social infrastructure, transport and utility infrastructures
- declining demand for local commercial services
- the emergence of vacant and derelict land and buildings (brownfields and vacancies)
- changing demographic characteristics (particularly a rise in the proportion of elderly people)
- greater pressures on local municipal budgets

Identified challenges in the study are amongst others related to **financial issues** since the issue of local government resources is crucial. One challenge is that **grants and subsidies provided** to local authorities from higher levels of government are often determined (fully or partially) **by the population**: a shrinking population could mean a loss of local authority income from external sources (in addition to losses from local income) at a time when resources are particularly in need of coping with resultant problems.

URBACT: Cities of tomorrow (Final Report 2011)

URBACT mentions demographic decline as one challenge to reach the key objective of the European Union, territorial and social cohesion. Demographic development is not only determined by birth rates and life expectancies, but also by mobility and migration. The study stresses that the **economic and social dimensions of demographic change** are as important as demographic trends themselves: Cities will face different challenges depending on the composition and evolution of their population structure in terms of age, household composition, the share of migrants, education and socio-economic situation.

The study sees **one challenge** in the **development of appropriate policies**; according to URBACT those need to distinguish between policies for cities in crisis and policies for successful cities, otherwise there is the risk of a two-speed Europe with huge negative social, economic and environmental disparities. **Another challenge** is seen in the **interplay between urban centres and their surrounding regional rural space**, together with the resilience and vulnerability of the natural resources in that peri-urban space.

URBACT II Capitalisation: From crisis to choice – Re-Imagining the future in shrinking cities (May 2013)

URBACT is a European programme for sustainable urban development. 2012 URBACT launched an overarching process to explore what cities themselves can do to address challenges that result from shrinkage. One of the results was that shrinking cities are less able to provide the levels of service expected by their populations. Therefore they have to **develop a realistic vision and set of sustainable strategic choices**, followed by **activating and engaging citizens** to help release the social and economic resources of the population. The **physical environment also leads to challenges for urban areas** due to the necessary use of vacant land, the interim use of buildings and the need to develop models that aim at revitalising stagnant land markets.

Hungarian Presidency of the Council of the European Union: The impact of European demographic trends on regional and urban development (Synthesis report 2011)

Shrinkage not only means population loss, but also leads to the problem of **oversized infrastructure** compared to the number of households. Oversupply can be witnessed in the case of housing and educational infrastructure since its development goes by the number of children, not that of households. Furthermore experience shows that downsizing the infrastructure and closing schools is always much more complicated than building new ones, since people **protest strongly against it**. The oversupply of other types of infrastructure (e.g. sewers, roads, heating) **causes the fixed costs of the system to be divided into fewer and fewer parts**, which makes operation less and less economical and affordable for the residents.

OECD/LEED: Demographic change and local development. Shrinkage, Regeneration and Social Dynamics (Final Report 2012)

The OECD/LEED final report mentions various challenges shrinking regions face and tries to give recommendations for them, among others

- for the development of economic sustainability, **the local economic base should be diversified** and local resources exploited
- national and local governments have to develop instruments together for **better management of fluctuating trends** (i.e. population growth and shrinkage in a given geographic area) and to respond appropriately to the changing environment. Efforts made at the city/municipality level alone may not be sufficient, and more consolidated regional efforts may be required
- environmental sustainability needs adequate management and resources to ensure the sustainability of cities/regions
- inclusion of stakeholders in decision-making processes, particularly local communities that are most affected by the shrinkage process
- careful assessments are necessary on local government level for prioritising and allocating appropriate funds (e.g. EU funds) in managing community shrinkage.

2.3 Provision of social and technical infrastructure and services: main results of cross analysis of infrastructure and service costs (Action 3.2)

The results of other studies presented in the previous chapter show that various challenges are related to processes of demographic change, but it has also become clear that the issue of rising costs in most cases is not being addressed directly. The demand for basic public infrastructures and services depends on the population in a given territory. A declining and ageing population may cause shifts in demand and rising costs. The ADAPT2DC project focused on this issue and asked how cost-effective provision of public infrastructures and services can be achieved. Until now, such macro-regional analysis in a central European context has rarely been done. One reason might be that cost related data of infrastructure and service provision needed for predicting the consequences of demographic change does not exist across (Central and Eastern) Europe on the same levels (local and sub-regional) and for all infrastructures. Since the desired data was neither available from Eurostat nor national statistical sources, the partnership decided to concentrate on commercial business intelligence data (for details see: Baron, Ochojski, Polko 2014). This allowed a wider cross-country analysis in a Central European perspective.

The project partners checked the availability of NUTS3 level data concerning costs of local public services delivery in national statistic offices, ministerial and regional repositories. NUTS3 level was considered the basic statistical unit for the national cross-check. The timeframe for the cross-check within the field studies included the year 1995 and the years 2000 to 2010. Infrastructure and service data described in national and sector specific statistics were cross-checked with cost-related parameters (cost, expenditure, demand, supply and bound external factors) by the ADAPT2DC project consortium. The results of the national cross-check showed that:

- within the scope of the ADAPT2DC project some data concerning costs of services and infrastructure is available in national statistics on various levels including LAUs;
- national approaches to the collection of data concerning costs of services and infrastructure are different, on average similar datasets can be obtained for 2-3 countries maximum;
- timeframes of available data are not always equal;
- national methodologies of gathering and aggregating data may differ even though the data set name matches (see: Baron, Ochojski, Polko, 2013a).

The lack of extent comparable data on public service economics across Europe that could be supportive in policy making was the reason that the project consortium decided to use commercial business intelligence data. Access

to business intelligence data (Amadeus by Bureau van Dijk) was obtained by the University of Economics in Katowice. A tailor-fit model was elaborated and implemented as a consequence. A so called proxy cost ratio (PCR) was calculated using the business intelligence data. The **proxy cost ratio (PCR)** shows the average sales of specific services per inhabitant of a territory**.** It should be pointed out that lower PCR levels are not to be valued more than higher ones and vice versa. The PCR proposed is rather "neutral" in that meaning it shows a certain comparable value of service delivered to citizens. It means that NUTS3 regions can be described by a value of service sold in the investigated fields. It is not the price of the service. The ratio remains at the heart of the cross analysis of infrastructure and service costs, even though bottlenecks of the approach have been identified. The PCR could only be calculated within the study as a static picture covering average values of the last five years. This was due to limitations in business intelligence data available for Central Europe (for method and details concerning the results presented below see: Baron, Ochojski, Polko 2014).

Social care, health care, public housing, public transport as well as water and sewage have been analyzed in terms of PCR at NUTS3 level and further statistically tested against demographic change, spatial and economic parameters. Observations regarding the proxy cost ratios are amongst others (for details see: Baron, Ochojski, Polko 2014):

- In terms of health care the greatest spatial variation of ratio was recorded in Germany. The ratio shows some regularity. The highest values in most countries are usually in large urban areas: Bratislava, Kosice (SK), Graz (AT), Budapest (HU), Kraków, Poznań (PL). These observations might be linked to the relatively small size of NUTS3 regions in Germany and the spatial concentration of specialised hospitals within large urban areas.
- In the case of water and sewage, the PCR values are quite diverse in Central European countries. There are some nationally observable peaks, but they may simply result from concentration of large suppliers of service.
- A study in housing was possible only for most regions in Poland and Germany. The values of ratio are higher only in some large urban areas, such as Gdańsk, Warszawa, Katowice, Wrocław and Szczecin. In Germany, the observed ratio is more spatially diverse than in Poland. However it should be noted that NUTS3 units in Germany are usually much smaller than those in Poland.

All the PCRs have been calculated as a base for further analysis against demographic changes as well as other economic and spatial characteristics of the NUTS3 territories. The analysis for all available PCR observations in Central Europe shows that for all cases the ratios are negatively correlated with long term population changes (not significantly correlated for social care). The PCRs are also positively correlated with population density (not significantly for water and sewage). The PCR for public housing is significantly correlated with all of the analysed variables (long term population change, medium term population change, average rate of natural increase, population density, elderly to active ratio, GDP per capita). PCR for health care is significantly correlated with all variables except the elderly to active ratio. Moreover numerous contextual and qualitative premises pinpoint that public service provision much relies upon the spatial characteristics of the territory. For this reason focused mapping and statistical tests have been done with reference to predominantly urban regions, intermediate regions and predominantly rural regions, according to the typology provided by Eurostat (Office for Official Publications of the European Communities 2010, p. 239-253)[5]. Also, the method has been applied to nationally tested variables (for details see: Baron, Ochojski, Polko 2014).

Finally a **clustering of NUTS3 territories** based on a joint computation of the proxy cost ratios as well as economic, spatial and demographic variables was conducted. The variables taken into consideration for the demographic performance of a territory are:

- the proxy cost ratios (PCRs) of public service costs within the different infrastructure sectors
- the population change (years 2000–2010)

5 The division into different territory types is based on the update of the urban-rural typology for NUTS3 regions of the European Union, see: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban-rural_typology_update (access 24 Feb 2014)

- the long term population change (years 1990–2011)
- the average rate of natural population increase (years 2000–2010)
- the elderly to active population ratio (year 2008)

The spatial characteristic of a territory was measured by the population density (year 2008) and the economic performance by the GDP (Gross Domestic Product) per capita in PPS (Purchasing Power Standard) (year 2008). A set of different cluster-types was generated for each infrastructure. Within the cross analysis of infrastructure and service costs, the clustering of NUTS3 territories that share resembling characteristics is meant to enable a better future transfer of solutions and best practices among Central European region (for identified clusters see: Baron, Ochojski, Polko 2014).

More detailed insights were provided through the **thematic field studies** on local level. Micro-cases, based on a common methodology for the investigation, were chosen to depict differences in economic performance. Furthermore, the overview of specific national and local contexts of service organization and delivery as well as the influences of political, social, technological and spatial determinants on local public services in Central European territories is described. The studies are sample cases of infrastructure and service provision in shrinking areas. Fourteen studies in comparative groups have been conducted in seven territories. The partnership distinguished between network (public transport, roads, water) and social infrastructures and services (housing, social and health care) conducting research on:

- social care (Jászárokszállás (HU), municipalities of Po Valley (IT) and Kozłów (PL))
- health care (Kozłów (PL) and Jászárokszállás (HU))
- housing (Katowice (PL), Vejprty (CZ) and Ljubljana (SI))
- public transport (Saale-Orla-Kreis (DE) and Vejprty (CZ))
- roads (Saale-Orla-Kreis (DE) and Ljubljana (SI))
- water (Katowice (PL) and municipalities of Po Valley (IT))

The **results of the field studies** can be summarised as follows:
Social care services show similar patterns in the studied cases. In general, the average cost per beneficiary rises. Social care services seem to be most vulnerable to population decline. Sudden changes to population structures directly raise expectations towards service delivery (more nurseries, shelters, subsidies paid, etc.). In other words, the increase in demand directly calls for an increase in supply of social care services.

Concerning the supply of **health care** services a general issue observed is the pressure to control the state expenditure on health care. That is, both related to the macroeconomic situation of a certain state and to demographic change. In that case, service quality and service supply are mainly impacted by state policy.

Regarding **public housing**, territories with a significant share of public housing stock can be more vulnerable to the economic consequences of population decline. The more the housing relies upon the public sector and its ownership, the more the demographic changes affect economic stability of local authorities. On the other hand, "cumulated" ownership allows easier facility management including relocation of tenants, deactivation of blocks of flats and other adaptation processes. In certain cases the public housing sector may use mechanisms of selective privatisation (single flat, single house).

The costs of **public transport** in the analysed cases are either balanced according to inflation or slightly going up. Although the return on public transportation ratios is not favourable, it is obvious that public transportation serves to achieve other general objectives, e.g. labour market dynamics and mobility and therefore needs public co-financing in most cases. In the analysed cases the share of subsidies goes up over the years and compensates the losses to the public service. As the population change is believed to influence the future situation of the service and its infrastructure, there is a question whether it may impact only the demand for the service or it will severely change the economy of operations. In other words, the subsidies delivered to the system are key to its functioning.

There is a basic mismatch between supply and demand in **road infrastructure** due to the fact that established

roads can hardly be deactivated, yet the maintenance intervals can be modified. While any significant increase in population may impact new road investments, the depopulation trend will rather not lead to road abandonment. For this reason, the main concern of any authority will probably be turned to the costs of maintenance. Investments and spending on new infrastructure would only be linked to development processes focused on boosting territorial attractiveness of precisely defined areas.

In general, as **water provision** is the basic public good, its demographic elasticity of supply is rather small. In other words, the demand must be fulfilled in any case; the only issue is whether the final beneficiary is able to cover the costs. So, the question is whether the (usually) increasing costs of water provision/ sewage treatment are transferred to the final user (citizen, company) or subsidised by public authority of any level. The fixed costs of the system mainly determine the economics of water provision/sewage treatment services and infrastructure. Maintenance costs and investments cannot be stopped over the depopulation processes as technical operation of the system needs to be kept. In certain cases either decentralisation or centralisation of water provision/sewage treatment can facilitate an efficient adaptation.

2.4 Lessons learnt

The aim of the EU (social and territorial cohesion) as well as the project define new modes for the efficient management and financing of social and technical infrastructures and services under shrinking conditions and can only be reached if national particularities regarding the **constitution of social welfare systems and of spatial planning systems are analysed** profoundly. The distribution of social services and infrastructures is especially embedded in national policy frameworks. It will only be possible to transfer functioning modes of adaptation from one region/country to another when enough knowledge about the different responsibilities and modes of providing and financing infrastructures and services is available. In the case of the New Member States in Eastern and Central Europe, a far more extended analysis of their welfare systems, the territorial and spatial planning and thus the responsibilities for providing and financing infrastructures and services is especially needed (see Humer, Rauhut, Marques da Costa 2013) if good practices of adapting infrastructures and services are to function in these regions as well. Another important point in CE countries is the development of further policies on the local, regional and/or national level that are clearly related to population decline.

In order to develop efficient management structures for infrastructures and services in conjunction with cost savings, it is furthermore necessary that **comparable and spatially locatable infrastructure data** exist across the European Union. The project has revealed that there is no extent comparable data on public infrastructure and service economics gathered across Europe (see Baron, Ochojski, Polko 2013a). This makes it difficult to understand the effects that demographic change and related processes have on the provision, management and financing of infrastructures and services. A way out of this situation had been shown by the project consortium by using commercial business intelligence data. The approach of delivering proxy cost ratios (PCRs) has been an attempt to overcome the data shortage in public statistics. A similar attempt has already been introduced by the OECD for microanalyses across countries. Regardless, the PCR could only be calculated within the study as a static picture covering average values of the last five years. This was due to limitations in business intelligence data available for Central Europe. Therefore this method should be further developed to achieve a dynamic model. This is a challenge for research groups or partnerships between researchers and Eurostat which have been set up within the framework of Horizon 2020 or ESPON. In addition, the studies on services of general interest (ESPON SeGI, see chapter 2.2) could be extended by cost-based analyses. Finally, the joint effort could enter the yearly statistical agenda supporting EU policies in further years. Therefore we recommend to Eurostat and/or national statistical offices as well as the European Commission to intensify the collection of such comparable data which could also be combined with business intelligence data. This would be the basis for appropriate policies and adaptation processes. The lessons learnt within the cross analysis of infrastructure and service costs and the proposed research method are believed to be a meaningful attempt that can be further developed and utilised.

3 Challenges and needs for the management of infrastructure and services in the pilot regions (Output 3.3.1)

Regional workshops were organised in the pilot regions during the course of the project. The main goal of the regional workshops was to gather regional stakeholders and to discuss with them the issue of shrinkage and its general consequences for the provision, management and financing of social and technical infrastructure and services in the pilot regions. Together with the stakeholders, the partners were asked to identify regional needs in terms of:

(1) Counterbalancing infrastructure and service costs, and

(2) Avoiding pitfalls in infrastructure development in shrinking regions and relating them to national, European and global (future) trends.

The partners were asked to summarise the results of the discussions in the form of an opinion catalogue; a template on how to fill in the catalogue was distributed in advance. The procedures for organising the regional workshops had also been distributed several months in advance.
The following regional workshops were organised by the partnership:

- Schleiz/Saale-Orla district and Arzberg/Oberfranken Ost (GER)
- Usti Region/Usti nad Labem (CZ)
- Krakow (PL)
- Maribor (SLO)
- Ostana (IT)
- Debrecen/Észak-Alföld region (HU)

3.1 Lessons learnt in the pilot regions

The regional workshops in the pilot regions highlighted that there are already many good examples and projects existing across Central and Eastern European countries that allow an adaptation to the consequences of demographic change in the field of social and technical infrastructure and services. Although nothing completely new needs to be invented, it is important to adapt existing good examples to regional and national frameworks. Several key challenges and needs were identified in the workshops. Some results are identical in several regions, whereas others were only mentioned in one or two regions. This highlights the importance of differentiating between specific local and/or regional and national and/or transnational challenges, needs and solutions. The needs and recommendations identified in the regional workshops include very general observations and very specific observations related to the infrastructure field with which the pilot action is dealing. The table below starts with more general observations:

Improve coordination, cooperation and communication: – within/across fields, administration, supplier, users; public, private; between communes to receive funding – on various levels (local-regional-national-supranational) – across borders (GER, SLO, CZ, PL, IT)
Raise (more) awareness amongst the population for issues of demographic change which might lead to personal constraints (GER, HU)

Activate the local population to increase voluntary engagement in infrastructure/service provision > strong dependency on voluntary engagement is a risk/does not allow long-term planning (HU, GER, IT)
Create more stable administrative situation/responsibilities (CZ, IT)
Adapt legal framework that allows: – flexibility of standards (e.g. number of pupils that are necessary to run a school, number of passengers using public transport) – more efficient distribution of taxes/subsidies (GER, PL, HU, CZ)
Adapt infrastructure to changing demands (e.g. public transport needs to be adjusted to the needs of the elderly; health care system will have to increasingly take care of very old people) (GER, PL)
Bundle – costs – (administration, infrastructure) structures – functions (GER, CZ, SLO, PL, IT)
Use existing infrastructure and adapt it to the special needs (of migrants, ageing society) (GER)
Long-term/sustainable planning of financing (PL- medical equipment; IT – after public funding for infrastructure projects terminates)
Change rules of how to obtain public funds for investments since co-financing is often impossible because local budgets have a spending freeze due to their debts (GER)
Combine different fund sources (local, regional, national, EU + private investments) (IT)
Consider the geographical location of a shrinking region when distributing taxes and subsidies and developing funding programmes (CZ, IT)
Secure broadband provision in all regions for supporting tele-/homework (cushions lack of jobs) (GER, CZ, HU)
Consider culture an instrument to increase attractiveness/economic basis of a region (SLO)
Introduce time and cost saving technologies (PL– telemedicine, GER- Ambient Assisting Living Systems that allow elderly to live in their homes longer)
Standardise technology in health care to allow stronger cooperation across communes (PL)
Improve early diagnosis of civilization diseases > improved training of medical personnel (PL)
Distribute funds in the health care sector which is more prevention based (PL)
Revitalise (city) centres to reduce land-use in the outskirts of the city/bundling of infrastructure: identification and support potentials vacancies are offering; create consciousness amongst real estate owners; provision of advice for owners/buyers, finding and applying new forms of vacancy management (GER)
Shape strong, innovative, flexible public transport that connects all relevant infrastructures in a region; considers needs of the elderly and allows commuting, therefore cushioning a lack of jobs (GER, CZ, HU, PL)

Table 1: Needs and recommendations identified in the regional workshops and related to the particular infrastructure field of the pilot action

The results of the regional workshops show that although the regional situation regarding geographical characteristics, legal framework etc. in the pilot region is very different, several similarities can be found. This supports the need for a transnational vision for the management and adaptation of public infrastructures and services to the consequences of demographic change. Nevertheless, regional and national contexts and frameworks need to be considered while transferring good examples and experiences from one region to another. Transferability can only be reached if there is enough knowledge about responsibilities and financing structures in the different infrastructure and service areas in the respective countries.

Another point which also came to the fore during the workshops was that although improving infrastructure and service provision is an important issue, it is not the main point for people when they decide where to live; above all is the question of finding a job. If people cannot earn their living in a region they will hardly move to or stay in a region, even if this region offers attractive infrastructures and services.

4 Future visions for management of infrastructures and services in different territories (Output 3.3.2)

The ADAPT2DC project not only deals with current demographic developments in Central European regions, it also focuses on future trends regarding demographic changes and asks what consequences it might have for the management, provision and financing of social and technical infrastructures and services. Since fewer population may lead to higher costs for the consumers and an ageing population means changing demands (e.g. day care services for the elderly, disabled-friendly public transport), it is necessary to adapt infrastructures and services and their management and financing to these new circumstances. To find out to what extent demographic change will influence the provision and financing of infrastructures and services (and which adaptation processes are needed) in the future, the project consortium asked experts and stakeholders in the participating countries for their opinion. The used method was a Delphi Study (see Mils 2007; Cuhls 2007; Baumgartner, Lehmann, Weber, Pütz 2010).

4.1 Delphi Study: method and implementation in ADAPT2DC[1]

The Delphi Study method has been used for the development of future scenarios on the provision, management and financing of infrastructures and services. It has helped supplement the findings from the previous research and regional workshops (see chapter 3). Its main results will contribute to the development of a joint transnational vision regarding the future provision of infrastructures and services.

In general, a Delphi Study has the aim of developing consensus amongst experts regarding their opinions over future trends. In the case of the ADAPT2DC project the future management and financing of infrastructures and services under shrinking population conditions and changing demands was addressed. Since this method is being used for the assessment of long-term issues, various experts across the participating countries were asked to judge different hypothesis regarding demographic change and its impact on management of network and social infrastructures and services before and after 2020 (Baron, Ochojski, Polko 2013b). The coverage of the Central European (CE) territory has been provided by addressing the Delphi Study at experts and stakeholders from the CE countries; this includes: Austria, Czech Republic, Hungary, Italy, Poland, Slovakia and Slovenia. Some limitations apply for Austria and Slovakia, as there were no country-dedicated stakeholders under the project framework to control the process.

The experts had different backgrounds; amongst others they came from the following fields: regional administration, NGOs, infrastructure provision, research institutions.

A Delphi Study provides potential answers or estimations to problems that can be identified today; in the case of ADAPT2DC it dealt with the consequences that may arise from decreasing total population for the provision with public infrastructures and services. To attain more precise answers the partnership divided the Delphi Study into two different territory types (rural and predominately rural territories; urban and intermediate territories)[2] and two different infrastructure and service types (network infrastructures and services such as roads, transport, water; social infrastructures and services such as social care, health care, housing). Therefore, four types of questionnaires had been distributed to the experts: urban/social, urban/network; rural/social and rural/network. The experts had been asked to give their answers for at least one territory type[3] and one infrastructure area. The study was organised into two rounds: after the first round the participants were informed about the results. Hypothesis that did not reach a consensus amongst the participants were included in the second round

1 The University of Katowice (ADAPT2DC partnership) was responsible for developing the Delphi Study. They were supported by ISCAS, TMBLV and IfL.

2 The division into different territory types is based on a new urban-rural typology for NUTS3 regions of the European Union, see: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Urban-rural_typology (access 05 Feb 2014)

3 Each questionnaire listed those NUTS3 regions in urban/rural territories in the CE countries to which the experts could refer.

(8 hypotheses for urban network infrastructure, 12 hypotheses for urban social infrastructure; 10 hypotheses for rural network infrastructure and 8 hypotheses for rural social infrastructure needed to be targeted again).

	First round	Second round
urban-social	32	21
urban-network	22	13
rural-social	43	21
rural-network	25	20

Table 2: Number of participants in Delphi Study

In total 197 stakeholders and experts from all over Central Europe participated in the Delphi Study (first round: 122, second round: 75). There were 88 completed questionnaires regarding urban areas, filled out by Polish, Czech, Italian and Slovenian experts (first round: 54, second round: 34) and 109 on rural areas filled out by experts from Czech Republic, Germany and Hungary (first round: 68, second round: 41). We received 80 replies on the network infrastructure (first round: 47, second round: 33) and a total of 117 responses describing influences of demographic change over social infrastructure (first round: 75, second round: 42). The study can definitely be further extended and enlarged to encompass every single NUTS3 region in Central and Eastern Europe and thus provide even more comprehensive expertise from experts and stakeholders.

4.2 Rural and predominately rural territories

4.2.1 Network infrastructures and services

Water
The experts expect a rise in water and sewage maintenance costs (per capita) in all countries due to a decreasing number of citizens. There was a consensus among the experts that the accessibility of water and sewage infrastructure will hardly be decisive for the local population development.

In Hungary, a significant number (> 70%) of respondents expect that investments of private businesses into the water infrastructure will significantly supplement public water systems, before and also after 2020 – whereas Czech and German experts are much more sceptical about this idea. The reason for the expectations of Hungarian experts might be that the communes in Hungary often lack the money to invest in modernised water infrastructure although it is urgently needed. About 10 % of the population does not have access to clean drinking water.[1]

Experts in all countries agree that climate change will not or only marginally influence the prices of water in Central Europe. For the timeframe after 2020, the influence of climate change on water prices is expected to increase slightly, but the overall importance remains low. Similarly, the experts see only moderate influence on the price of water for tourism and related public services.

Transport
All experts expect a strong or moderate increase of individual transportation due to a decrease in public transport

1 See http://www.pesterlloyd.net/html/1246arsentrinkwasser.html (access: 04.02.2014).

offers. Although one expert pointed out that the share of individual transport is already extremely high in German rural areas and only "dependents" such as pupils and elderly people use public transport. Another one pointed out that carpooling may increase. This may be connected to new communication technologies which make it easier to organise carpools.

German and Czech experts were convinced that territorial reorganisations and closures of schools will strongly reduce the supply of public transport. In Hungary only half of the respondents expect such a reduction. One respondent pointed out that closure of schools does not lead to a reduction in the offer but only to a shift in destinations.

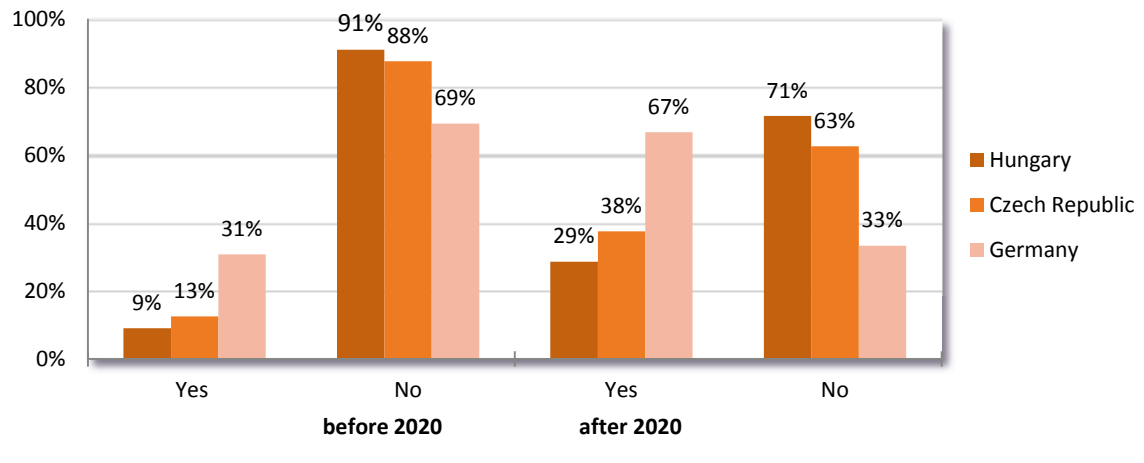
A majority of experts believes that the costs for operators of public transport will rise strongly or moderately because the EU will impose new regulations and new technologies, for instance environmentally-friendly technologies. At the same time, a majority expects rising public co-financing in the future – the same is true for investments in public transport. Asked for cost-saving solutions (for instance "call-a-bus" services) the point was made that this may be a supplement to existing offers but not a real alternative since communities are mostly legally obliged to maintain certain transport, in particular pupil transport.
Concerning the costs of road maintenance the majority said that a closure or deactivation of roads will only have moderate influence on controlling excessive spending.

On a more general level: on the question of whether investments in network infrastructure, such as roads, water and energy networks will have an influence on inverting depopulation trends, experts were split. Whereas most Hungarian and Czech respondents deem that this will not have an influence on depopulation trends, some experts in Germany find that there could be at least a moderate influence.

4.2.2 Social infrastructures and services

In general, the experts anticipate an increased concentration of social services, particularly in the long run: for the period after 2020, 78% of the respondents agree with the statement that the delivery of social services will be concentrated in one or a few multifunctional centres. For the period before 2020, only 56% agree with this hypothesis.

Figure 1. **The territories affected by depopulation and ageing will [...] deliver social, counseling, welfare, referral and similar services mostly as e-services**



Source: ADAPT2DC Delphi Study

In the course of the study, the hypothesis was formed that in the future administrative services would have to be delivered mainly as e-services (e.g. issuing of official documents, download of documents, e-government) in territories that are strongly affected by depopulation and ageing.

However, a large majority of the respondents do not agree, at least not for the timeframe before 2020 (> 80%). Different obstacles have been pointed out: to use e-services a decent broadband connection is necessary, which is not the case in all rural areas; especially elderly people may not be comfortable with e-services; computer-literacy may not be high enough; certain services demand face-to-face contacts.

A typical statement was that "e-services can supplement but not replace current services". However, for the period after 2020, the expectations towards e- services are higher. For that timeframe, 41% of all respondents claim that e-services will play a role in depopulating areas.
Unsurprisingly, it is generally expected that ageing and remote areas will suffer from population outmigration even more due to exclusion from social services – although a number of respondents underline that access to infrastructure is not the heart of the problem; it is the lack of jobs that are the reason for outmigration out of those areas. This corresponds with findings from regional workshops which had been organised within the project. However, when asked whether governments will subsidise these remote areas particularly to compensate for the disadvantages, most experts see no chance of this or only a moderate chance. Some even question whether subsidies would be suitable at all, emphasising that the flexibility of standards is more urgent for shrinking remote areas.

Childcare
A near-consensus (> 88%) was reached on the statement that "new forms of child nursing services" or at least a flexibility of operation times of childcare institutions will be necessary due to the stronger flexibility of working hours and working models. Respondents seemed to feel strongly about this issue, many underlining the importance of sufficient childcare opportunities for the different work-time models of parents. A German respondent pointed out that childcare will not be the main issue in the future, but rather care for seniors ("But it should be considered that in the future childcare will not be the main challenge. The main challenge will be care for seniors. The current discussion is fixed too strongly on childcare"). A Hungarian respondent stressed the importance of working opportunities for women which are connected to childcare facilities ("Trends of population decline could be reversed by the increase of women employment, by the capacity building of childcare institutions and by the increase of the quality of these services").

Housing
A serious drop in the property value of houses is expected for rural areas affected by demographic change. 73% of the respondents expect the property value to decrease. Similarly, the volume of vacant houses is expected to rise by 80% of respondents. Many respondents pointed out that the differentiation between "rural" and "urban" areas is important in this regard: whereas property prices will rise sharply in urban areas, rural areas will rather be affected by vacancies2 ("In rural regions I expect shrinkage, ageing, vacancies of buildings and decay and loss of value of buildings"). At the same time, the maintenance costs for the housing stock are expected to rise in rural areas. In the comments it became evident that many of the respondents seemed to think of the costs for conversion into barrier-free homes adapted to the needs of the elderly, even though one respondent also emphasised the significance of rising energy prices.

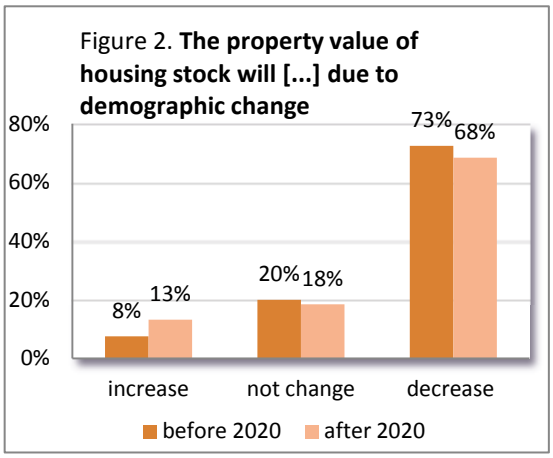


Figure 2. **The property value of housing stock will [...] due to demographic change**

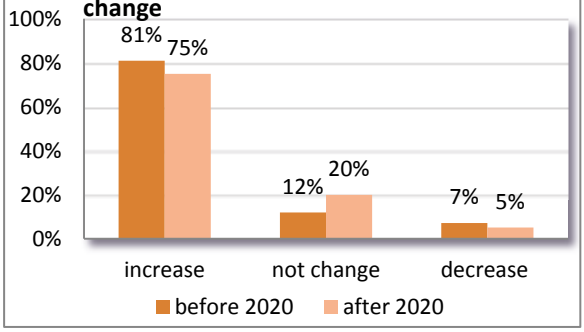
Source: ADAPT2DC Delphi Study

In the face of vacancies, a majority expects a rise in the number of deconstructions of houses in rural areas in

2 The trend of urbanization was mentioned in all countries.

the long run – however, some seem to be sceptical about the importance of this trend, particularly in the short run (comments in Germany: "Deconstruction usually needs additional public finances. If these are not available, there will be more decay than deconstruction", "There are tendencies of inertia: unrealistic perceptions of value or the idea that population will increase again later"; comments in Hungary: "It is not realistic that unused houses are going to be demolished: the licensing and financial implications of the demolition are significant, thus there will be hardly anyone to undertake them"; comments in Czech Republic: "This isn´t a common phenomenon yet"). A comparison by country shows that experts from the Czech Republic are the most sceptical about the trend of deconstruction: here, 75 % expect "no change" in the amount of deconstructions in the timeframe before 2020 (but after 2020 already 50% do expect deconstructions to happen).

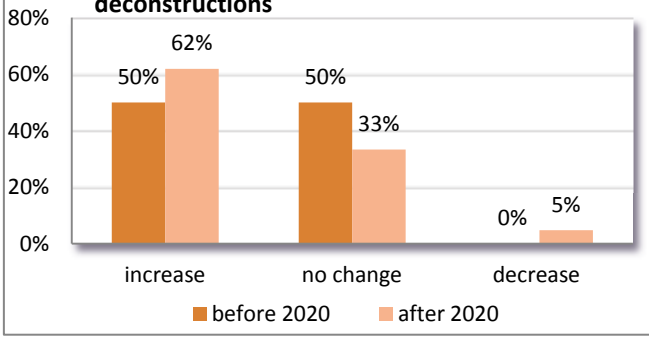
Figure 3. **The volume of vacant housing stock will [...] due to demographic change**



Source: ADAPT2DC Delphi Study

When asked whether "the demand for public housing among elderly people will change due to demographic change" respondents were split: only 53% expect an increase in the demand, the rest sees no difference or even a decline in demand. Many experts seemed to associate the demand for public housing entirely with poverty and unemployment but not necessarily with old age or demographic change. Others expect old age poverty to rise.

Figure 4. **Housing vacancy resulting from population shrinkage will lead to [...] in deconstructions**

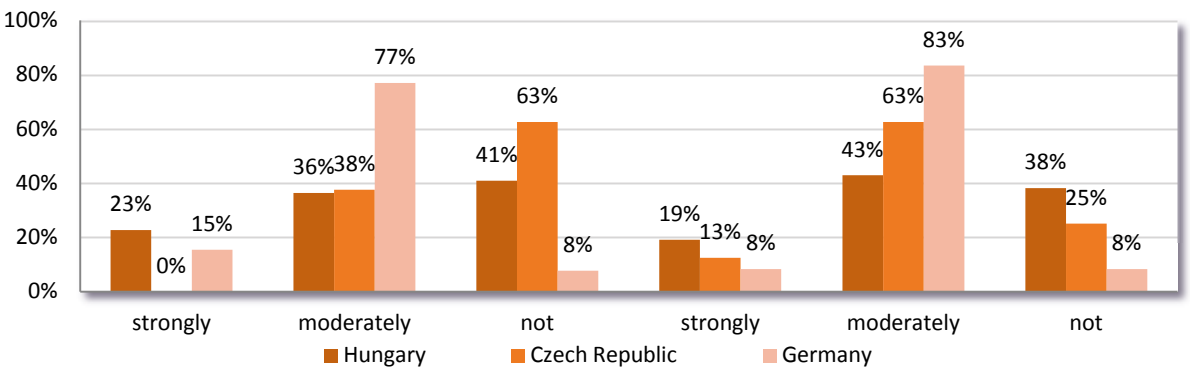


Source: ADAPT2DC Delphi Study

Health

When questioned whether the operator costs for health care services will be reduced due to increased co-financing by patients, most experts responded that this will not be the case or only moderately. The comments make it clear that several experts do indeed expect an increase in patient's co-financing, but this will not be sufficient in compensating rising costs in the health system ("Co-financing by patients cannot reach such levels that they

Figure 5. **Investments into diversification and quality of health care and social care services will [...] determine inverting depopulation trends**



could totally compensate additional funding needs generated by persistent service development demands"). Similar to before, experts are of the opinion that investments into the quality of the healthcare system will only have moderate or no influence on population trends. Here again, the quality of infrastructure is not seen as the main influencing factor but rather the availability of jobs. One respondent from Germany also emphasized that not the quality but the maintenance of health care services in general should be in the centre of attention ("At the moment it is important to maintain the facilities: if the facilities are not there anymore, there is no need to ask about the quality").

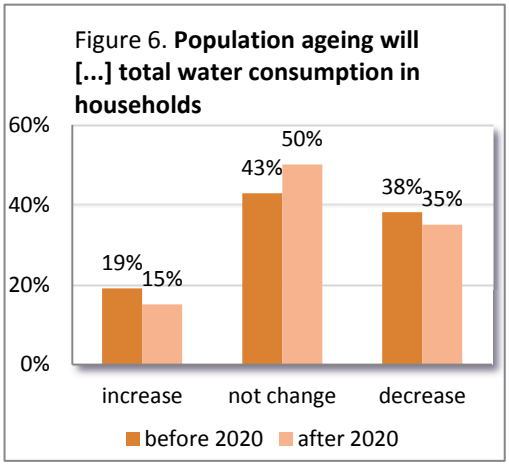
4.3 Urban and intermediate territories

4.3.1 Network infrastructures and services

Water

No consensus was reached for the question of how the ageing of population will influence water consumption in households. Experts in all countries were divided, so that the question was asked a second time in the second round of the survey. This time, the majority expected "no change" and some a "decrease" (but in the second round no expert anticipated an increase in water consumption due to ageing). Similar to the findings for rural areas, the majority of the experts expect rising water and sewage costs for the public sector before and after 2020 due to an increased demand for land in city suburbs.

Figure 6. **Population ageing will [...] total water consumption in households**



Source: ADAPT2DC Delphi Study

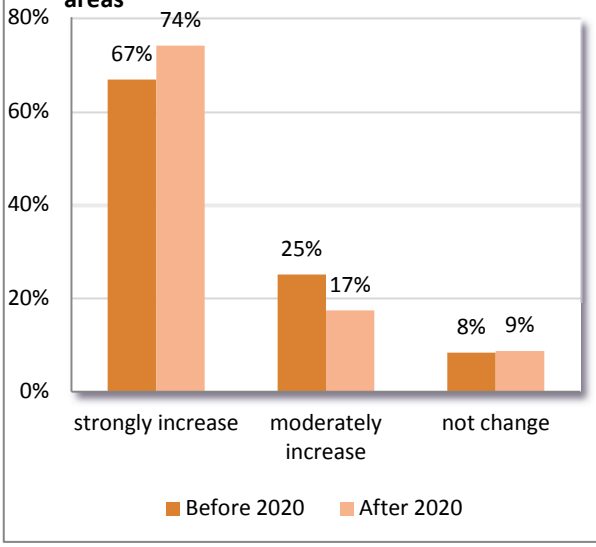
Experts from Poland (64%) and Italy (75%) are expecting an increase of operators' costs of service delivery due to technological innovation in water and sewage treatment before 2020, whereas experts from Slovenia (50%) and Czech Republic (67%) expect decreasing costs due to innovation processes. These differing expectations regarding the cost-savings through innovation might be connected to negative experiences with innovative solutions, often implemented through EU or national funds. As a consequence innovative solutions might be associated with rising prices since the achieved savings are not handed down to the users but go the provider companies. This expectation matches another result from the survey: 77% expected an increase of consumer prices due to technological innovation. One comment emphasised regional differences regarding the rise of consumer prices ("There will be great regional differences. There will be dominance of supply over demand and the other way around").

Transport

The experts agreed that depopulating villages will be much more threatened by a shortage of public transportation services than depopulating towns. At the same time the majority (before 2020: >95%, after 2020: 100%) expected a stabilisation or increase of the role of public transport in urban areas. One Czech respondent emphasised that this is connected to the growing number of senior citizens ("Public transport is mainly used by seniors. The growing number of people using public transport is connected to the expected increase in the number of seniors"). The expected increased demand of public transport makes it necessary to develop new public transportation services, also considering changing needs due to ageing societies.

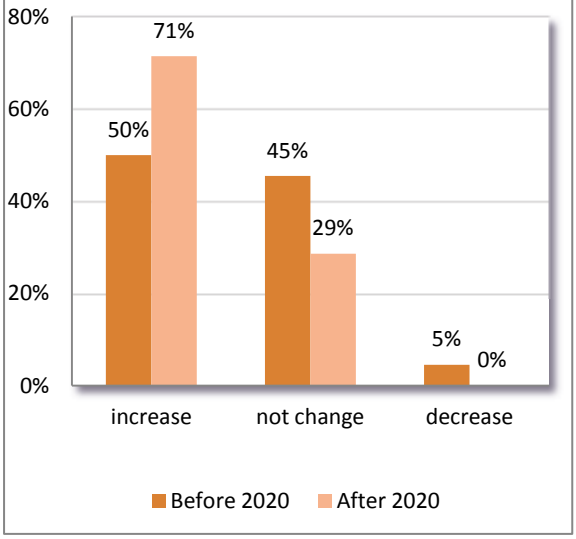
The graphs below shows the strong difference between rural and urban areas: whereas a large majority in rural areas believes that the share of individual transport will increase, the majority in urban areas expects the role of public transport to increase.

Figure 7. **Rural areas: The share of individual transportation (e.g. cars, bikes) will [...] increase due to decrease in public transport offers across the depopulating areas**



Source: ADAPT2DC Delphi Study

Figure 8. **Urban areas: The role of public transport will [...] in the forthcoming years**



Source: ADAPT2DC Delphi Study

The role of state and/or European funds for the development of new transport services was judged differently: the majority of Polish, Czech and Italian experts agreed that the development of new transport services will only be realised if such funds are made available (only for the period before 2020). The Slovenian experts did not agree on this question (50% stated yes, 50% no). For the period after 2020 the experts could not reach a consensus on this question (also after the second round). Half of the experts expected that new services will only be developed if state/European funding is available; the other half did not see this as a requirement.

Another option for financing public transport is the promotion of cost-effectiveness. Asked whether this could be reached if medium/long range transportation operators overtake short range transportation services, the experts considered that this will not or will only moderately be the case. Only the Slovenian experts agreed that medium/long range transportation will overtake short range services significantly. For the period after 2020 this option was evaluated stronger - now the majority agreed that this will happen significantly or moderately. The potential of e-service tools targeting the organisation of transportation services to raise cost-effectiveness was evaluated as moderate or significant by the majority (95%) for the period after 2020.

4.3.2 Social infrastructures and services

In comparison to rural regions, only Czech and Polish experts anticipate an increased concentration of social services: for the period after 2020, 81% of the respondents from these two countries agree with the statement "the delivery of social services will be concentrated in one or a few multifunctional centres" (for the period before 2020, only 67% agree). The experts from Slovenia and Italy did not anticipate this development. The influence of spatial bundling on the general costs for social care delivery was judged rather negatively/with no huge influence: 43% expect a stabilisation of costs, 43% an increase due to spatial concentration of services in multifunction centres before 2020. Only 13% expect decreasing costs due to spatial bundling. This is a clear contradiction to the findings in ADAPT2DC. The spatial bundling of services was often mentioned as one option for cost savings; several best practices also lead to the assumption that this is one option to save costs.

Figure 9. **The delivery of social services will be concentrated in one or a few multifunctional centers/sites**

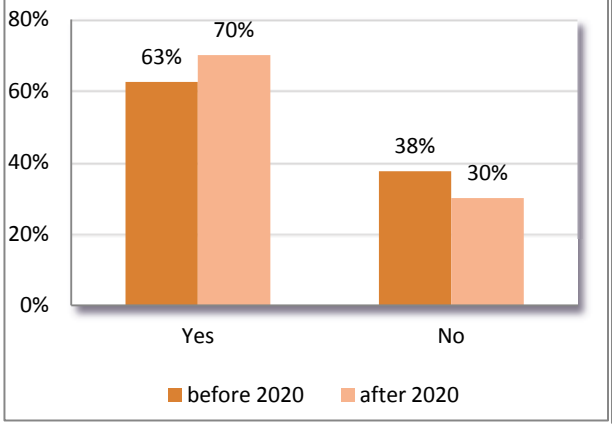
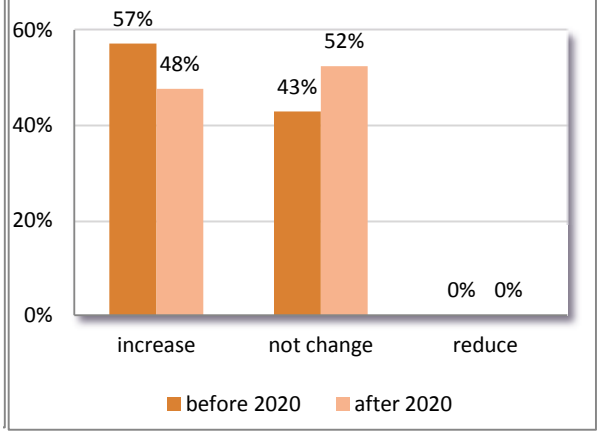


Figure 10. **Spatial concentration of services in multifunction centers will [...] the general cost of social care delivery**



Source: ADAPT2DC Delphi Study

Housing

Many respondents pointed out that the differentiation between "rural" and "urban" areas is important when looking at the influence of demographic processes on the housing sector: whereas property prices are expected to rise sharply in urban areas, rural areas will rather be affected by vacancy.1 The trend of rising property prices in urban areas is quite evidently connected above all to high demand. However, other factors play a role as well. Some experts note that it is connected amongst others to the commercialisation of public housing infrastructure. All experts see a moderate or significant trend towards the commercialisation of public housing. At the same time the majority expects that public housing will dominantly be intended only for households with legally guaranteed support (comment from Czech respondent: "The offer of public housing won't increase in the Czech Republic, conversely it will decrease because of a continuing privatisation of the municipal housing stock"). Asked whether public-private housing will emerge as a new trend that will increase the supply of public housing - and by that help to reduce the pressure on property prices - was evaluated positively by 62% of the experts, but only for the period after 2020. For the timeframe before 2020 the evaluation of the experts was more differentiated: 59% stated that this will not emerge as a new trend; 41% expected an increase of public-private housing.2

The experts had also been asked to evaluate the influence of green technologies on the long term maintenance costs for housing: 84% expect a reduction of maintenance costs through green technologies (after 2020: 96%). Similar expectations were expressed for large scale passive housing sites: 75% expect a significant or moderate influence through the introduction of passive housing on the reduction of maintenance costs (after 2020: 71%).

Health

The cost of service delivery in health care is expected to increase or stabilise due to standards imposed by the national health care funding system in all countries. Concerning the concentration of health care services, it was asked whether this concentration may shift access costs from operators to final users (for instance because final users will have to pay for longer transport to the doctor): the majority of respondents expects that this will be "strongly" or "moderately" the case (before 2020: 90%, after 2020: 96%). Similar to the rural areas, experts are of the opinion that investments in the quality of the healthcare system will only have moderate or no influence on population trends.

1 Although this section is concerned with shrinking urban areas, the experts might point to rising property prices in urban areas in general.

2 Public-private housing is a form of a public-private partnership. Here communes/municipalities hand over public land to private investors so that they can build houses there. This is often done when communes/municipalities lack enough funding to build new public premises.

4.4 Lessons learnt from the Delphi Study

The Delphi study asked for expectations regarding the future development of infrastructures and services. It was partly asked whether investments in infrastructures would have effects on the population size (and if so, to what extent). In this regard, the most important finding is probably that none of these aspects is deemed to be the most important factor for attracting inhabitants. In fact, the **availability of jobs** was repeatedly mentioned as the decisive factor. When it comes to influencing population trends, the lack of jobs is considered to precede the potentials of infrastructural reconfigurations and innovative solutions. This applies particularly to childcare, care of the elderly and transport services and corresponds with findings from regional workshops which were organised within the ADAPT2DC project. There, too, stakeholders had emphasised that people move to those places where they have decent employment opportunities, and not primarily to those places where the kindergartens or care homes are particularly modern. Thus it must always be kept in mind that the quality of infrastructure is important for the quality of life of the local population, but it will not in itself be enough to influence decisions on where to live, respectively to influence population flows.

The Delphi study participants emphasise **rising maintenance costs** and significant **changes in demand for technical infrastructure**, especially in the rural context. This suggests the necessity to revise legal standards and regulatory frameworks to realise cost savings and implement flexible solutions (e.g. in transport infrastructure). Approaching this problem is more challenging for depopulating rural municipalities than urban ones, since technical infrastructure is less flexible due to its spatial dimension and complexity (e.g. water and transport networks). Therefore maintenance costs for technical infrastructure are more difficult to reduce or stabilise.

In general, the costs are expected to rise for almost all types of infrastructures. This is true both for the rural and the urban context. There are also some differences though. One difference pertains to public transport. All experts expect a strong or moderate **increase of individual transportation** in rural areas due to a decrease in public transport offers. In contrast, experts from urban areas anticipate a more important role for public transport in the future. Particularly the obligatory provision of public transport by rural and urban municipalities makes it necessary to develop additional and alternative cost-saving solutions (e.g. call-a-bus services). The increasing **demand of seniors for public transport** urges the adaptation of public transportation services to the changing needs of ageing societies.

Within the survey, some suggestions for "innovative" solutions were also mentioned, such as using e-services for the provision of social services, deconstruction of vacant buildings in rural areas, or new trends in the provision of public transport (such as 'call-a-bus' lines). Interestingly, the scepticism of respondents prevailed. Particularly the "comments" section showed that respondents think firstly about obstacles for new ideas, and not firstly about the chances.

A similar observation could be made for the notion of "spatial concentration". Experts from both rural and urban areas mostly expect a spatial concentration of social services in multifunction centres, particularly for the period after 2020. This presupposes a high degree of inter-communal and intersectoral cooperation, assuming efforts are made by administrations and service providers. However, cost savings are not expected by this type of spatial bundling, at least not in the urban context. This is a clear contradiction to the assumptions in ADAPT2DC which emphasise the advantages of spatial bundling. Two messages could be derived from this: either the assumptions of the project were wrong or indeed the saving opportunities of spatial concentration have not been communicated clearly enough to relevant decision makers. Seeing that all project results (pilot actions, background research, best-practices) point to the cost saving effect of concentration, the latter seems to be the case. Therefore it is necessary to communicate the cost-saving effects of concentration more strongly when addressing stakeholders.

The results should be understood against the backdrop that the experts' estimations are significantly influenced by the different institutional and regulatory frameworks in Central European countries and their geographical characteristics. This complicates the implementation of innovative solutions to adapt governance and management of public infrastructures to demographic change. Furthermore the findings reveal interdependencies and causal chains between the availability and accessibility of different infrastructure sectors.

The problem of cost pressure and marginal funds implies the controversial issue of whether governmental subsidisation should compensate existing deficits while retaining maintenance standards or to emphasise the flexibility of standards and a possible cutback on infrastructure provision in shrinking areas.
These lessons learnt within the Delphi Study lead to the broader context of policy recommendations for a transnational vision for the provision of infrastructure, which will be elucidated in the following chapter.

5 Joint transnational vision for future provision of infrastructures and services in shrinking regions and cities

Coming to the core of this position paper and on the basis of the identified problems and challenges within the ADAPT2DC project, as well as other projects and studies, we have developed on the one hand more general recommendations which we think are necessary to consider while adapting the welfare systems across Central Europe and beyond to demographic change. These general recommendations consider eight areas - some of them are already being considered/practiced to some extent, but from our point of view need to be considered much stronger on various levels in the future.

On the other hand we have developed recommendations for single infrastructure and service areas - on the basis of our experiences with the pilot projects that were carried out within the project, lessons we have learnt from the best practice collection and on the basis of our own research, which we mainly carried out in Germany, focusing on good practices concerning the adaptation of single infrastructure areas to the consequences of demographic change. The focus of these recommendations for single infrastructures and services is on efficient management and cost savings since this was the main focus of ADAPT2DC.

Both types of recommendations shall help develop a joint transnational European vision for the future provision of infrastructures and services in shrinking regions - a core aim of the ADAPT2DC project. The formulation of such a transnational vision will be finalised in the further course of the ADAPT2DC project.

5.1 General thoughts: necessities when dealing with demographic change

This chapter bundles general approaches which the authors of the Position Paper think are necessary for coping with the consequences of demographic change in the future. These recommendations are not only relevant, but for the EU-level as well when developing transnational strategies for appropriate handling of demographic processes.

- **Long-term thinking**

Demographic change is a long-term issue in permanent progress, constantly challenging, but will only unfold its full consequences in 30 years, or possibly even later. However, it is necessary to intensify the adaptation of welfare systems as well as technical and social infrastructure networks and services now in order to cope with the effects that will derive from demographic change such as population shrinkage and ageing. When addressing the challenges associated with demographic change, strategic thinking is necessary; the current focus on legislative periods is not suitable for an issue as complex as this one. Isolated sectoral thinking may also be counterproductive to long-term sustainable development objectives. Hence, a mere reaction to crises will inevitably be more expensive than long-term planning.

- **Acknowledging the reality of shrinkage**

For decades, our economic systems and their accompanying welfare systems have been focused exclusively on growth, both in terms of output generation and in terms of population. However, in the 21st century we are arriving at a point where blind growth is neither no longer desirable – considering the overexploitation of natural resources, climate change or the ongoing financial crisis – nor the reality: societies in Europe and the western world in general are stagnating or even diminishing for the first time - by individual choice, not catastrophes. Demographic change demands a new strategic orientation: clinging to outdated notions of growth will not set our countries on the right path for the future. Several regions in Central Europe are already hard-hit by the out-migration of the population towards their national capital and/or other countries. As a consequence these rural regions are losing tax revenues and potential. These developments have to be dealt with by political concepts which are adapted to the reality of shrinkage and that are already being applied in some regions. One option is to change current growth-oriented strategies into qualitative decline-oriented ones. This would include amongst

others controlling the housing market by demolition, downsizing and introduction of new forms of housing; introduction and/or extension of flexible (e.g. standards, sizes, usage) and multifunctional (e.g. combining offers) infrastructure and service solutions; restructuring the local economy by attracting those economic sectors to a region that meet the education-level of the local population1 and also lures back the educated young people who would otherwise never return to the region (Wiechmann 2006). So far, in most countries the issue of shrinkage has only appeared on the policy agenda when profound problems have already become virulent (from housing vacancies to social segregation). However, a more general re-consideration is necessary. In a context of diminishing population (at least in some regions) and depleting resources, it has to be accepted that eternal growth is not a realistic scenario. At the same time shrinking is not to be seen as a negative phenomenon per se (at least until the point where it endangers the local economic base) since it provides the opportunity to create a more liveable, less dense living environment and it may remove environmental pressures and increase green spaces. Shrinkage may lead to a new equilibrium on a lower spatial and population level but adequate management and resources will be required in order to ensure the sustainability of cities and regions.

- **Revising standards**

In regions characterised by a shrinking and ageing population, many of the existing standards have only limited use. Many standards are tailored for cities with high population densities. However, the necessary investments overwhelm smaller communities (examples are requirements for central sewage treatment plants, minimum sizes of school classes, requirements for the equipment of fire brigades and minimum number of firefighters per community). A flexibility of standards would widen the scope of shrinking regions for innovations. Given the different population densities in different regions, scale-differentiated standards might be an option. The provision of grants and subsidies to local authorities from higher levels of government also needs to be revised, since they are often determined (fully or partially) by population: a shrinking population could mean a loss of local authority income from external sources (in addition to losses from local income) at a time when resources are particularly in need of coping with resultant problems. Therefore, new standards and/or exceptions from existing standards are necessary since they enable shrinking regions and cities to cope with the consequences of demographic change.

- **Cooperation and coordination**

There is an understandable tendency of communities and regions to promote their territories to potential inhabitants, especially young and well-educated people and companies. However, an overemphasis of promotional measures can lead to unproductive competition between communities. The designation of new housing estates or new commercial fields can cause an influx of population, but often at the expense of neighbouring communities. The same is true for expenditure on promotion campaigns. Competition will therefore not lead to ideal overall results; a focus on cooperation is preferable.

A similar observation can be made of the competition for subsidies or grants: the smaller the administrative units, the more lobbying for an indiscriminate distribution of funds. In many cases, cooperation and coordination would lead to better and more efficient results.

- **"Compact growth" instead of sprawl**

As far as settlement structures are concerned, the development of town centres should come before the development of suburbs. Two processes are at work here. Firstly, empty and decaying buildings in town centres are perceived as ugly (or even as "dangerous") and thus have a strong negative influence on the image of a town. They can depreciate the value of property in the vicinity. Secondly, the development of suburbs is associated with higher costs in terms of infrastructure: a new housing estate has to be provided with roads, water, sewage systems, electricity, internet, and so on, not to mention the higher costs for regular commuting or errands.

Potential new inhabitants (or investors) should therefore be directed towards empty buildings in the town centre, not towards the suburbs. In shrinking towns, permits for new housing estates should not be granted at all.

Compact growth strategies should furthermore be combined with adapting the physical environment of town

1 Although there is a risk of a regional lock-in.

centres to (changed) needs of an ageing society: physical barriers should be removed as far as possible to make the centres (more) attractive to the elderly and disabled as well as to families with children. This may also lead to retention and/or attraction of residents.

- **Holistic thinking**

A more holistic thinking is necessary if we want to develop sustainable and long-term solutions that help to adapt to the consequences of demographic change. Mere sectoral interventions will not result in sustainable answers, since different sectors influence those adaptation processes (politics, economy, administration, infrastructure providers etc.). Furthermore, local adaptation solutions are not efficient if they are not coordinated with the regional and national framework. Therefore it is necessary to go on with the development of policy answers on various territorial levels. Finally, the issue of demographic change should more strongly be related to other issues such as economy, environment, infrastructures and migration.

- **Consider regional particularities and differences**

There is often the strong wish to develop a one-size-fits-all transnational strategy, especially in transnational projects. Although some solutions might be developed on the highest level of decision-making, national, regional and local particularities and differences need to be considered.

Regarding the development of new modes of adapting infrastructures and services to demographic change, we can say that a lot of good practices already exist in different regions across Europe; however, in order to transfer them from one country/region to another, it is important to ask which decision-making level is responsible for a certain infrastructure in the country and which one is financing its provision (e.g. in Germany the federal state level is responsible for schools).

One option to facilitate the transferability from good practices to others is the creation of learning organisations within recently shrinking cities and regions that can resort to experiences other shrinking cities and regions have already made. This could help to adapt good practices to new institutional, economic and cultural contexts.2

- **Paradigmatic change of EU regional development policy**

So far, regional and municipal governments have been encouraged to implement investment-oriented policies instead of cost-saving policies while using EU structural funds. Elected regional and municipal governments tend to build any type of new infrastructure in their regions, even if they do not need it or do not have budget for its maintenance. From a short term perspective it is an additional input for municipal/regional budget which is usually positively perceived by the public. However, the main principles of European regional policy might be reconsidered in order to stress long-term sustainability more than before and positively evaluate cost-saving projects and policies.

5.2 Policy recommendations for single infrastructure and service areas

The following policy recommendations for single infrastructure and service areas, presented in bullet points, are conclusions from the pilot actions, the Delphi Study and the field studies, which were all carried out in ADAPT2DC. Additionally, we have included lessons learnt from the best practice catalogue and our own research on successful projects and initiatives that show how adaptation to demographic change can be achieved for single infrastructure and service areas (mainly in Germany). The recommendations will be given for the following thematic fields which go beyond the pilot projects realized in ADAPT2DC. However, one should keep in mind that the responsibilities for providing, managing, organising and financing the above-mentioned infrastructure and service areas differ in the participating CE countries. Therefore not all recommendations will be suitable for every region in CE:

2 For further information on this issue see FP 7 Shrink Smart Research Brief No. 2, 2012 (Bernt et al. 2012: 20).

	Pilot Action (WP 4)	Delphi Study (WP 3)	Best Practices (WP 4)	Field Studies (WP3)
Technical infrastructures				
Transport/mobility		x	x	x
Water/sewage		x	x	x
Social infrastructures and services				
Health Care	x (PL)	x	x	x
Childcare	x (HU)	x		x
Local supply	x (IT)		x	
Housing & public spaces	x (CZ, SLO, GER)	x	x	x

Table 3. Type of action/analysis and respective thematic fields

5.2.1 Technical infrastructures

- **Water and sewage treatment:**

lower standards (not every house needs to be connected to a central sewage plant if there is a local solution) - decentralisation (centralised systems have much higher fixed costs and cannot be adapted rapidly to changing population) - de-connection of disperse houses where possible (find individual solution) - prohibit building of new houses in shrinking regions (aim should be centralisation, bundling, usage of already existing infrastructure) - reduce and refit facilities - adapt tariffs for water supply (the lowest price in areas that are well equipped with water infrastructure) - cooperation between providers - extensive reduction of facilities and building of semi-central nets with decentralised sewage treatment

- **Transport and mobility:**

connect infrastructures in the nearest town with surrounding villages - make public transport more attractive (for the elderly, disabled, tourists) and increase income and attractiveness - combine school, goods and public transport (needs legal adjustments) - promote flexible and alternative forms of mobility/transport (carpools, spontaneous car passenger systems1) - lower standards and create more flexible rules/guidelines - citizens busses as supplements for public transport

5.2.2 Social infrastructures and services

- **Health care:**

bundle services while using modern technology such as telemedicine (avoids travel costs and times) - use unnecessary infrastructure for mobile/local practices and combine it with other offers (health and social centre) - build strong connection/cooperation between regional health care and transport providers (provide health care in the closest agglomeration and connect the region to it) - help the people to stay in their familiar surrounding as long as possible (e.g. with the help of AAL Systems - Ambient Assisted Living Systems)

1 One example of a spontaneous car passenger system is CARLOS. Its main idea is to combine the public with the private transport system. At digital columns that are integrated into the stops of the public transport system passengers can enter their destination and purchase a ticket. The destination is clearly visible for drivers who pass by. The driver who is willing to pick up the waiting passenger receives the ticket which can be exchanged at gas stations or the public transport agency. Then the driver receives half of the ticket price. For more information see http://www.carlos.ch/index_en.html (access: 13.01.2014) or Ehrlich et al. 2013, p. 19-20.

- **Schools and childcare:**

decrease standards (minimum number of children that are needed to keep a school open) - bundle childcare, schools, elderly care in one building, use the same infrastructure and employees - bring childcare and care for the elderly together in one building and offer programmes where both can profit from each other

- **Local supply:**

spatial bundling of different services in one place - one person takes care of several institutions/duties - focus on regional products (less dependency on global chains and regional marketing that attracts tourists) - involve citizens (engagement/money) - introduce innovative financing opportunities (time bank, cooperatives, community supported agriculture) - cooperation between public and private stakeholders for bundling of resources, realisation of multifunctional facilities and a flexible organisation within public facilities

- **Housing and public spaces:**

bundling and centralisation - prevention of sub-urbanisation - introduce energy saving in the buildings to save costs - find new usage possibilities for unnecessary buildings (use empty offices as apartments) - build temporary buildings for temporary events (recycle them)

- **Inter-communal cooperation:**

bundle services in one central place and connect it with the public transport - develop specific features in each town/city, but cooperate while promoting the region (for attracting tourists, businesses, investors, new inhabitants) - cooperation between public and private stakeholders for bundling of resources, realisation of multifunctional facilities and a flexible organisation within public facilities - introduce flexible and mobile solutions that are easily to adapt to population changes (e.g. mobile citizens bureau)

These general recommendations and necessities when dealing with demographic change and the policy recommendations for social and technical infrastructure and service areas build the basis for the formulation of a joint transnational vision which will be developed in the further course of the ADAPT2DC project. Concluding the Position Paper and in context with the presented recommendations, the lessons to be learnt for the improved provision, management and financing of infrastructures and services in shrinking regions in the chapters above are subsumed below.

The distribution and provision of social services and infrastructures is embedded in national policy frameworks. It is only possible to transfer functioning modes of adaptation from one region/country to another if enough knowledge about the different responsibilities and modes of providing and financing infrastructures and services is available. An important point in CE countries is to develop further policies on the local, regional and/or national level that are clearly related to demographic shrinkage.

In order to develop efficient management structures for infrastructures and services in conjunction with cost savings, it is furthermore necessary that comparable infrastructure data exist across the European Union. The project has revealed that there is no extent comparable data on public infrastructure and service economics gathered across Europe (see Baron, Ochojski, Polko 2013a). This makes it difficult to understand the effects demographic change and related processes have on the provision, management and financing of infrastructures and services. A way out of this situation has been shown by the project consortium, using commercial business intelligence data. The approach of delivering proxy cost ratios (PCRs) has been an answer to the data shortage in public statistics. A similar attempt has already been introduced by the OECD for microanalyses across countries. The PCR method should be further developed to achieve a dynamic model. A scrutiny like this could be repeated every two or three years. Therefore we recommend to Eurostat and/or national statistical offices as well as the European Commission to intensify the collection of such comparable data which could also be combined with business intelligence data. It is only possible to understand the interplay between changing demands, population and the costs for providing infrastructures and services if such extended data collection is realised. This would be the basis for appropriate policies and adaptation processes. Moreover, the PCR clustering can be a useful basis for policy makers and managers to transfer and implement best practices. The lessons learnt within the cross analysis of infrastructure and service costs and the proposed research method are believed to be a meaningful attempt that can be further developed and utilised.

The regional workshops in the pilot regions highlighted the importance of differentiating between specific local and/or regional and national and/or transnational challenges, needs and solutions, to adapt existing good examples to regional and national frameworks. The results of the regional workshops show that the transferability of good examples and experiences from one region to another can only be reached if there is enough knowledge about responsibilities and financing structures in the different infrastructure and service areas, as well as the regional and national contexts and frameworks in the respective countries.

Resulting from the Delphi Study that emphasises rising maintenance costs and significant changes in demand for technical infrastructure, especially in the rural context, it is suggested to revise legal standards and regulatory frameworks to realise cost savings and implement flexible solutions. In addition, the notion of spatial centralisation presupposes a high degree of inter-communal and intersectoral cooperation, assuming efforts to be made by administrations and service providers. The assumptions and results (pilot actions, background research, best-practices) in ADAPT2DC emphasise the cost saving effect of spatial centralisation. An important and decisive factor to attract and retain inhabitants is the availability of jobs. When it comes to influencing population trends, the lack of jobs is considered to precede the potentials of infrastructural reconfigurations and innovative solutions.

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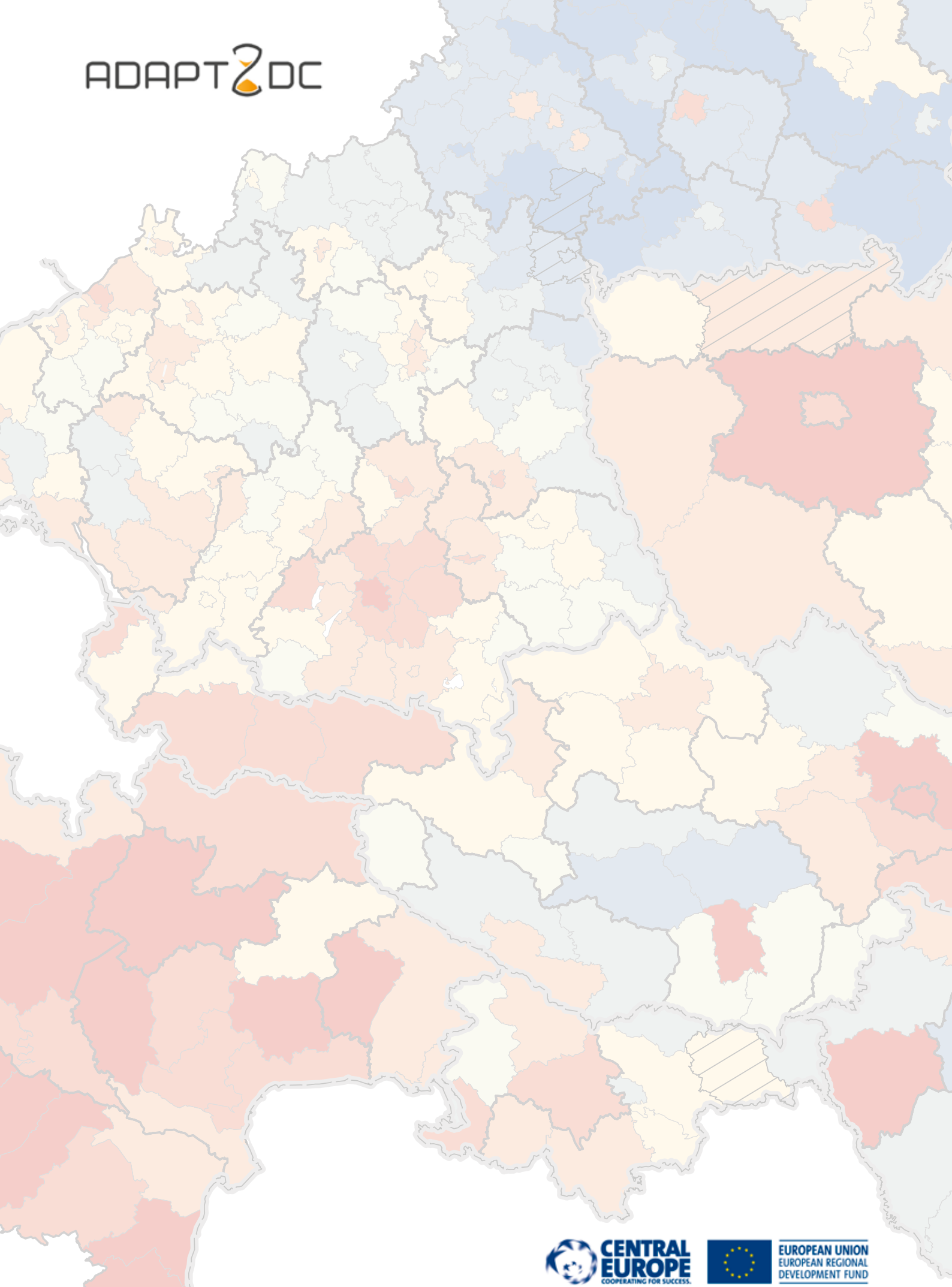

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