

SERVICES OF GENERAL INTERESTS IN MAZOWSZE REGION – ABBREVIATION OF ESPON SEGI CASE STUDY REPORT¹

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Abstract: The main purpose of this paper is to present the most fundamental processes related to location and accessibility of different elements of social and economic services of general interest in the Mazowsze region. In the last two decades, a process of considerable investment in the development of technical and social infrastructure has been observed, but the most important question is whether this process was similar on the whole territory of the region? This study is based mostly on the data from Central Statistical Office and from a survey conducted in 2011 among representatives of all local self-governments; it presents findings of the ESPON SeGI project.

The main finding of this research concerns the distribution of services of general interests, which are concentrated in areas of high demographic density. Such services are often centralised in agglomerations and centres of counties and towns (e.g. education, health service, telecommunications, sewage, etc.). Economies of scale privilege large towns, the larger the agglomeration, the larger the incentives of service providers to serve the region. Small towns/villages find it hard to provide services in remote areas or to maintain high quality services due to financial feasibility of such services.

Key words: economic services of general interests, social services of general interests, spatial analysis, Mazovia, Poland

1. INTRODUCTION

Poland can be described as a transitional country where market rules have replaced the central planning system. Since 1989, local governments have taken on an increasingly important role in providing services of general interests; before this year, the majority of services were provided by central administration by means of sectoral divisions. The socio-economic transition and reforms of the system empowered local administration by providing budget for fulfilling the needs of local communities (which became one of the main tasks of local offices). Apart from services which are provided by local administration (like supplying water, waste collection, etc.), there is a group of

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services which is delegated by the central government to lower levels of administration, including primary education, social care on local level, and health care (hospitals) on county level.

The Polish welfare regime can be described as transitory, starting with economy transformation in the early 1990s and changing towards a market oriented economy. According to the categorisation of welfare regimes of Fenger (2007), the Polish system mix has some characteristics of both the Corporative-Conservative and the Social-Democratic types, while not developing into Liberal types. Fenger (2007) considers the transitory regime of Poland as part of the “Developing welfare states type”, which represents countries that are still developing towards mature welfare states. Both, the programme variables and the indicators concerning social situation remain clearly behind the levels of the other groups of countries.

The national state is responsible for the regulation of all services of general interest in Poland. Their provision is generally in the hands of local governments (water, sewage systems, primary education, care services, local roads). Health care and secondary education are of the competence of counties. After the transition, private companies have entered the market and they have taken up the provision of key services (gas, electricity and telecommunications/ICT). State roads and tertiary education are provided by national authorities (some motorways, however, are operated by private companies).

In this publication, special attention is paid to empirical analysis in the Mazowsze voivodships/region (in the report the term Mazovia is also used), which is located in central Poland, spread over the Mazovian Plain, crossed by the Wisła (Vistula) river. The present administrative borders of the region do not cover all historical and cultural areas that used to be called Mazowsze in the past. The northern part of the region borders with Warmińsko-Mazurskie and Kujawsko-Pomorskie regions (voivodships); at east it borders on Podlaskie and Lubleskie regions, at south on Świętokrzyskie region, and at west it borders on Łódzkie region.

Mazowsze region is the largest (35.6 thous. sq. km) and the most populous (5.27million inhabitants) of the 16 Polish voivodships. Two-thirds of its residents live in cities, with Warsaw being the centre of the largest conurbation in Poland (Warsaw metropolitan area). The major cities of the region are Warsaw (1.7 million), Radom (221,000) in the south, Płock (125,000) in the west, Siedlce (76,000) in the east, and Ostrołęka (54,000) in the north. The capital of the voivodship is also the national capital, Warsaw. The Mazowsze voivodeship is divided into 42 counties (powiat) and 314 communes (gmina), which include 85 town and cities.

At the turn of the 21st century, the Mazowsze voivodeship ranked first among Poland's provinces in the total value of industrial output and in amount of foreign investments. Warsaw is the financial capital of Poland and an important centre for Central Europe. Industrial activity is centred in the Warsaw Industrial District, which includes Warsaw, Płock, Pruszków, Żyrardów, Piaseczno, Ożarów, Sochaczew, Grodzisk Mazowiecki, Legionowo, and Mińsk Mazowiecki. The majority of state enterprises are headquartered in Warsaw. Leading industries in the city include automobile manufacturing, steel production, food processing, and business services. Other industrial centres are Płock, where large petrochemical plants PKN Orlen operate, and Radom, which has a military factory. Even though the province is highly industrialized, two-thirds of it is farmland which is used for agricultural production. Mazovia is a leading producer of potatoes in the country. Other major crops include rye, sugar beets, fruits, and vegetables. Warsaw is a hub for both rail and vehicular traffic, with access throughout Poland and across Europe. A river port on the Vistula operates in Płock. Warsaw Chopin international airport, in a southern part of Warsaw, is the nation's busiest airport; the second airport in the region (Modlin) started to operate in 2012.

The main purpose of this paper is to present the most fundamental processes related to location and accessibility of different elements of social and economic services of general interest in Mazowsze region. Those elements were selected to be comparable between a number of European countries. In the last two decades, a process of considerable investment in the development of technical and social infrastructure has been observed, but the most important question is whether this process was similar on the whole territory of the region? This study is based mostly on the data from Central Statistical Office and from a survey conducted in 2011 among representatives of all local self-governments; it presents findings of the ESPON SeGI project and is an abstract of the “Case Study Report: Poland (Mazowsze)” developed under that project. It should be treated as an example of empirical analysis made as part of the project.

2. ECONOMIC SERVICES OF GENERAL INTEREST

The development of local gas distribution networks is determined by the location of transmission networks in Mazovia. The most extensive gas distribution infrastructure is located in the cities and communes located in the surroundings of Warsaw (counties: Piaseczyński, Grójecki, Grodziski and Pruszkowski) and in individual municipalities spread across the region. Near 47% of communes in Mazowsze region have a gas distribution network. In another 15% of communes network is available only for every 10th inhabitant. Only 18% of communes in Mazovia have gas networks that satisfy the needs of more than half their inhabitants.

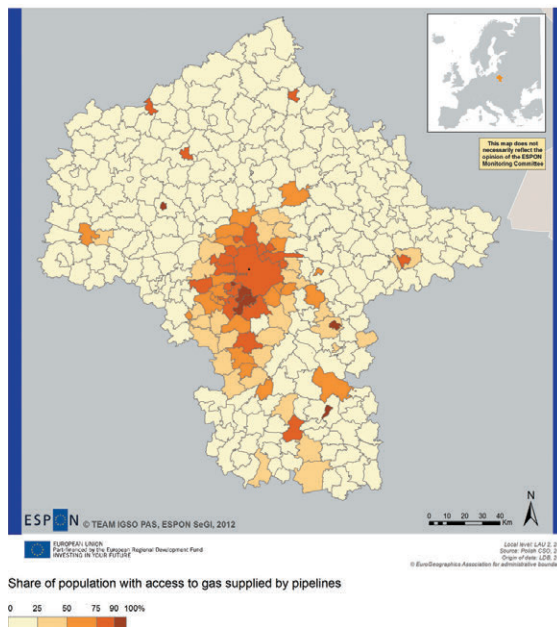


Figure 1. Share of population with access to gas supplied by pipelines

The highest density ratio of **water supply systems** is observed in the communes located centrally (Warsaw and communes located south of the capital), in the north-western part of the region (sub-region Płocko-ciechanowski), and in county centres. The lowest density of water supply networks is

observed in the communes located in the southern and north-eastern part of the region and in some municipalities north of Warsaw. The longest water supply systems in the region are located in Warsaw and in the following counties: Płock, Płoński, and Radom, characterised also by relatively high values of network density.

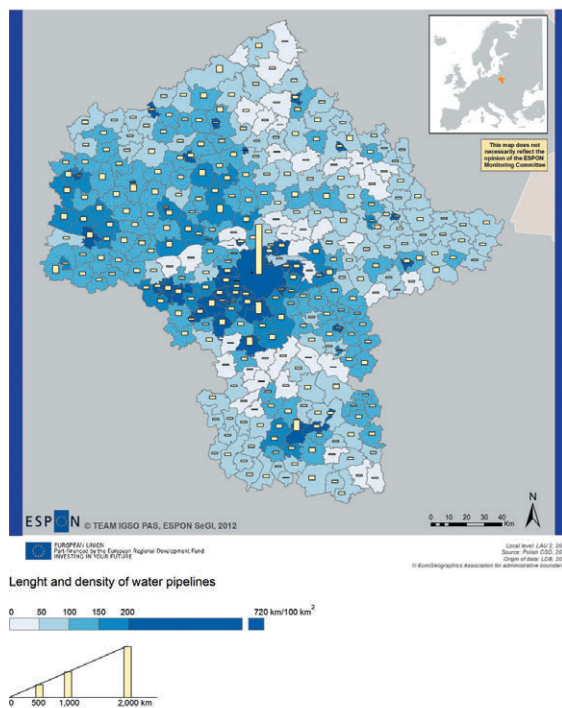


Figure 2. Length and density of water pipelines

In 2002, only five municipalities in the province did not have a water supply network, and in 26 communes networks serviced less than 20% of the population. More than 70% of communes had water pipelines that provided access to water for more than half of the population, and only in every 10th village water supply networks served more than 90% of the population. By 2010, as a result of investments made after the Polish accession to the EU, and of the new possibilities of financing the infrastructural facilities, water supply infrastructure improved. Only in three municipalities in Mazovia less than 1% of the population had access to water supply, and in eight communes the percentage of people having access to a water supply systems was less than 20%. In the survey conducted among local representatives on the condition of technical infrastructure in the communes of Mazowsze region, the majority of interviewees assessed the quality of installations as very good or good (77% of total responses). Such assessments may be due to relatively new infrastructure installations - in the majority of cases water supply systems have been built within the last 20 years. The average mark was given to water supply installations in 19% of communes, and installations in 3% of communes were rated as bad and very bad.

Sewage networks are complementary to water supply networks. Unfortunately, the development of the sewage networks in Mazovia does not match the dynamics that can be observed in the case of

water supply networks. Local authorities a relatively started catching up in infrastructure disadvantage, but first investment efforts focused on water supply networks. This was dictated by the need to secure the quality of water used in households and to account for economic factors - construction of a water supply system was much cheaper than building a sewage network.

In the early 1990s, sewage systems were located mainly in urban areas and relatively rarely existed in rural areas. However, the networks existing in the cities satisfied the needs of only some of inhabitants, and required further development. Most households in Mazovia, in both urban and rural areas, used sewage tanks.

In 2002, in 36% of the municipalities of Mazowsze region there was no sewage network, in further 23% sewage networks serviced only every tenth inhabitant, and in 18% of the municipalities this rate was between three and five out of ten inhabitants. More than half of the population could benefit from the sewage network only in 15% of the municipalities, but only in four municipalities sewage networks provided service for over 90% of the population.

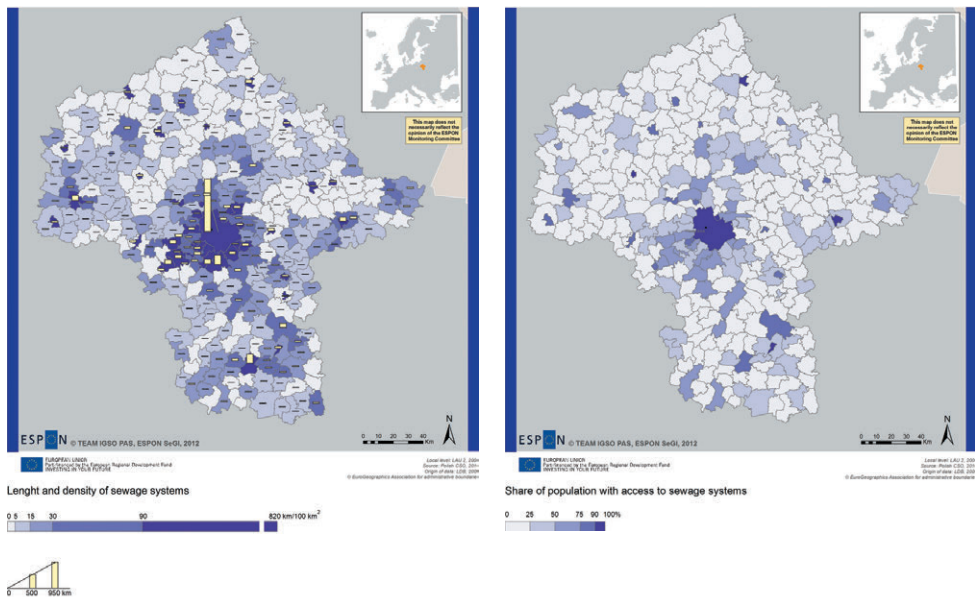


Figure 3. Length and density of sewage systems and share of population with access to sewage systems

In 2010, 25% of communes in Mazovia had no sewage systems. They were only rural communities or rural areas in urban and rural communes. It should be noted, however, that compared with 2002, this group was reduced by 10%. The group of villages which provided service for only 10% of the population decreased; i.e. in 2009, municipal sewage systems which focused on a very small area (usually the commune centre) were provided in 13% of the total communes of the region. Increased in the group of communes where sewer systems provided services for 10-30% of the population (28% of communes) and communes, where more than half of the population was served by the network (22%). Municipalities where more than 90% of the population could benefit from the sewage network were still few in number - in the whole province there were only 9 of them in 2010, and they were almost only large and medium-sized towns.

Both the density and length of sewage networks in Mazovia were much smaller than the length and density of the water supply systems. Clear differentiation was observed between urban areas, which were characterised by relatively high levels of density, and rural areas, which were characterised by low values of the indicator, or even by the lack of sewage systems. Concentration of communes with the highest values of the indicators concerning the density and length of the sewerage system can be observed in the central part of the region (Warsaw and its zone of influence, particularly communities located south and southwest of the city), Płock and its surrounding at the west of the region, and Radom with its suburban zone in the south.

As in the case of sewage networks, **sewage treatment plants** occur mainly in urban areas and in areas that are characterised by a highly developed sewage network: Warsaw and its surroundings - mainly municipalities south of the capital city, and county municipalities. Relatively fewer sewage treatment plants exist in the county of Radom, where sewage systems are characterised by a high rate of density. Another issue is the daily capacity of the plants. In most cases, these are relatively new facilities, created in the last 15 years, so they are able to meet the local demand. Older facilities, which were built in the 80s, underwent a major refurbishment, which increased their capacity. Generally, local authorities try to increase the capacity and where this is not possible, to invest in new treatment plants.

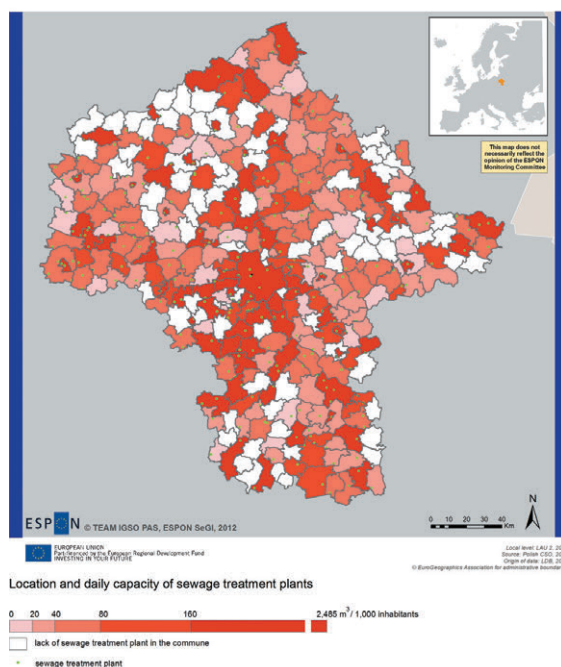


Figure 4. Location and daily capacity of sewage treatment plants

In 2010, there were, on average, 19.3 **fixed-line phone subscribers** for 100 people living in the Mazowsze region, which is higher than the average for the whole country (15.4 subscribers per 100 people). A clear dividing line for fixed phone network provision runs between rural and urban areas, with cities having 24.2 subscribers per 100 residents, and rural areas only 10.3 subscribers per 100 inhabitants. This result is only slightly higher than the national average for rural areas, which is 9 subscribers per 100 people.

Telephone network service

Cellular networks

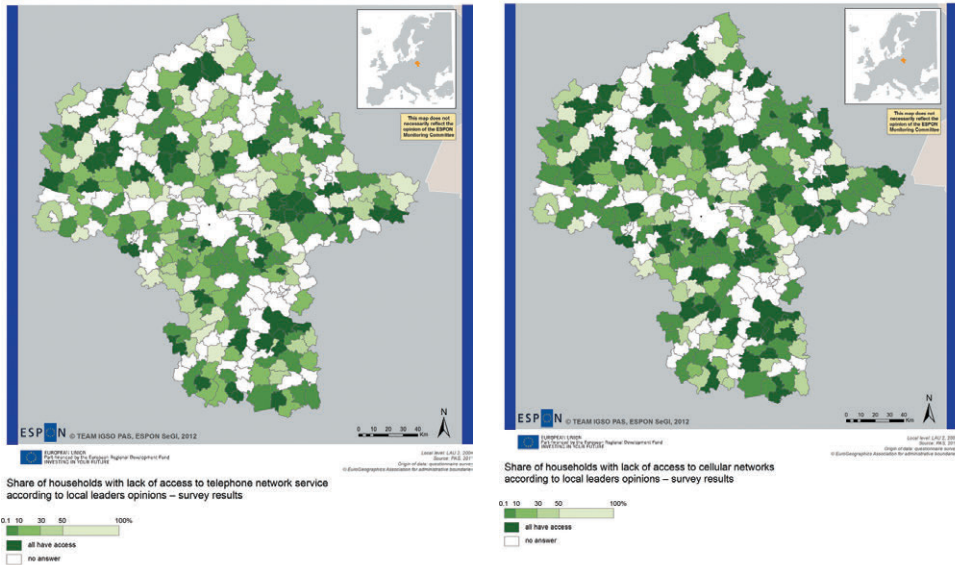


Figure 5. Share of households with lack of acces to telephone and cellular networks

A survey conducted among local officials referred to the telecommunications infrastructure issues in three ways. The first question concerned the quality of the network. The quality of the fixed telephone network was assessed as very good or good in 74% of communes. The quality of the cellular network at the same level was assessed in up to 80% of the responses. The second aspect covered in the survey concerned the share of households that do not have access to telecommunications networks. The percentage of households where access to the fixed telephone network is not more than half the population, is in the among surveyed communes is 15% in the case of cellular phones 10%. The last aspect examined by the survey was the need for construction and expansion, or for repair only, or no need for investment. In the case of fixed-line phone network, 45% of responses indicated a need for construction and development. Just over 8% of municipalities indicated repairs only. More than half of communes expressed the need for expansion or construction of a cellular network.

The largest number of **residential buildings** in communes of Mazowsze region is found in: Warsaw (almost 84.1 thousand residential buildings or about 10% of residential buildings in the region), Radom (19.6 thousand), and Piaseczno (14.4 thousand). It is natural that a greater number of residential buildings are located in areas with higher population density.

Thus the highest number of dwellings per thousand inhabitants in Mazovia is observed in Warsaw Metropolitan Area - it is the result of the size of households (the structure is dominated by small families, with a high proportion of single-person households). High saturation with flats is noticed in the southern part of Siedlce-Ostrołęka subregion - in recent years, an intensive process of building recreational development in this area has been going on (due two factors, i.e. the landscape values of the river Bug and a relatively small distance from Warsaw). In other areas of the region (especially those peripherally located in rural areas of agricultural character), the saturation with flats per thousand inhabitants is much smaller. This is due to extended families living together, and to the low levels of construction.

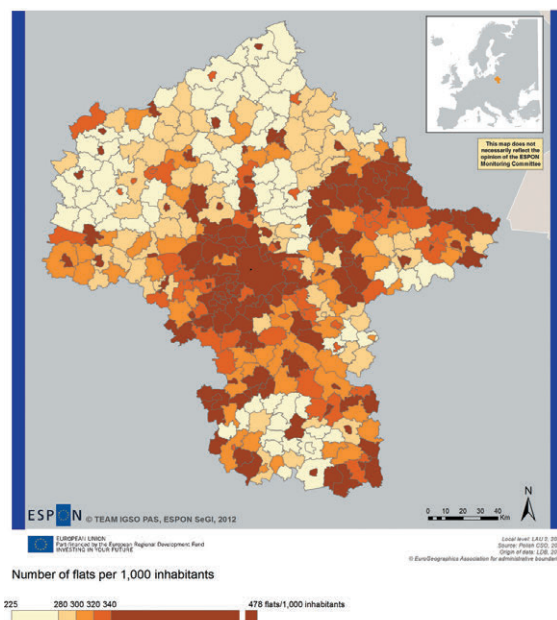


Figure 6. Number of flats per 1,000 inhabitants

Nowadays, the population increase is observed primarily in suburban areas - population growth in the period 1995-2010 was observed in a dozen of municipalities around Warsaw, 10 around Radom, 5 around Płock and Ostrołęka, and one near Ciechanów and Siedlce. Changes in the population show a strong relationship with the construction of new houses. On average, in Mazovia 1.8 building per 1,000 inhabitants were erected during the period 1998-2010. Generally, the highest construction traffic is observed in municipalities in the counties surrounding Warsaw – especially, in areas of high landscape values (like Kampinos Forest, the Zegrze Lake) and areas with good transport accessibility (railway lines towards Otwock, Grodzisk Mazowiecki and Wołomin). Suburban zones of Radom, Płock and Ostrołęka are compact areas with intensive construction development. In the case of Siedlce and Ciechanów, high values of construction development are limited to individual communities (rural communes around Siedlce and Ciechanów). In 1995-2009, housing investments rose in Mazowsze voivodeship highest in the country (about 26%). This increase was mainly due to the rapid growth of housing in Warsaw (about 33%). In the rest of the region, the housing increased since 1995 by 21%.

A clear correlation can be observed between the price of building plots, houses or flats and their distance from Warsaw. The most expensive plots of land are in counties adjacent to Warsaw, prices are much higher in the south (left bank of the Vistula River) and west of the capital. The land on the right bank of Vistula is relatively cheap; being the cheapest in the counties located further away from the city borders.

Number of inhabitants in years 1995–2010

New residential buildings in 1998–2010

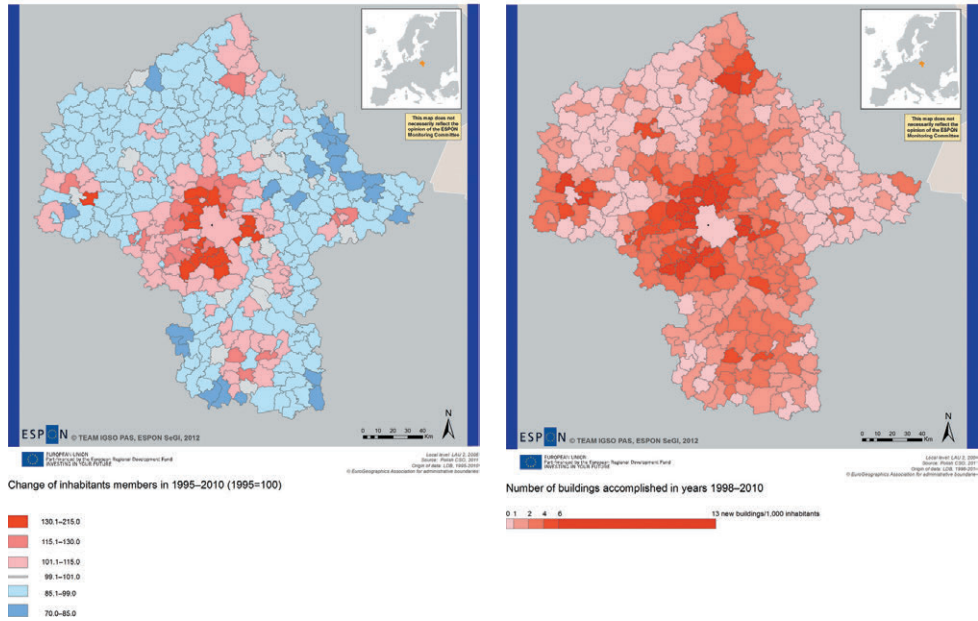


Figure 7. Change of inhabitants members in 1995-2010 and number of buildings accomplished in years 1998-2010

Housing

Average house price

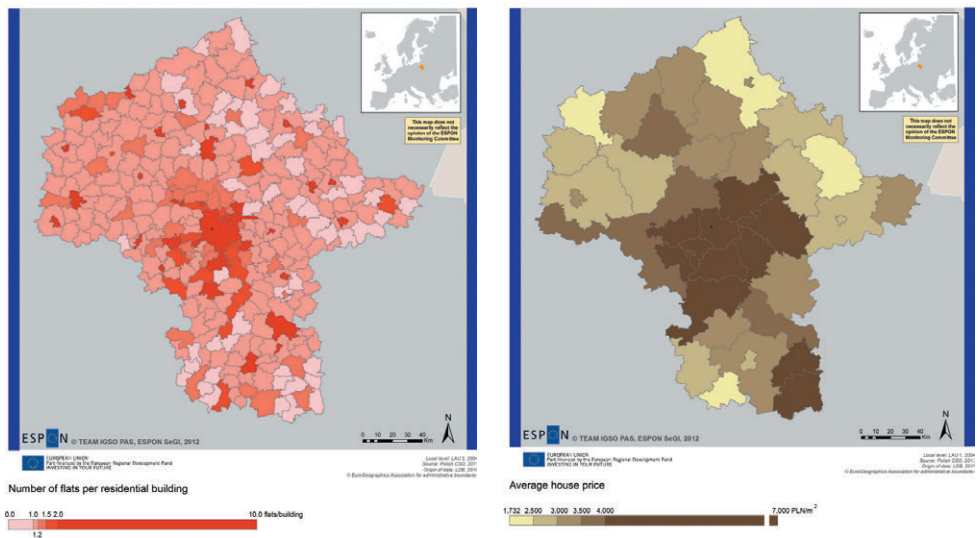


Figure 8. Number of flats per residential building and average house price

In 2010, the total **length of roads** in the Mazowsze region was 50.4 thousand km, of which 2.4 thousand km were country roads, 3.0 thousand km regional roads, 15.1 thousand km county roads, and 31.9 thousand km – communal roads. The density of roads was 147 km per 100 km², which was a higher rate than the national average. Over 31 thousand km of roads has improved surface. At the same time, the Mazovia has the highest (next to the Wielkopolska) motorization rate (500 passenger cars per 1,000 inhabitants in 2010).

There are three main road routes that pass through the voivodship: Cork-Berlin-Poznań-Warszawa-Minsk-Moscow-Omsk (E30), Prague-Wrocław-Warszawa-Białystok-Helsinki (E67), and Pskov-Gdańsk-Warszawa-Kraków-Budapest (E77). The A2 motorway is the first freeway to connect the region, and therefore the capital city, with the rest Europe, entering to the region from the west and stopping in Warsaw. The freeway will pass directly through the voivodship from east to west, connecting it with Belarus and Germany.

Basic layout of the main roads in the region (national and provincial) is the most consistent. Accessibility analysis shows, however, that there are several missing links in the system. These include primarily:

- Full Warsaw motorway ring road, which determines the accessibility of virtually the entire eastern part of the region (as well as the accessibility of Podlaskie and Lublin regions);
- New express road sections, particularly in the direction of Białystok (S8; bypass Marki), Krakow (S7), Katowice (S8), and Gdansk (S7; bypass Łomianki);
- Crossing bridge over the Vistula River (including commuting) in the area of Solec, Koźnice, Wilga, Konstancin-Jeziorna and Łomianki;
- Road Wyszaków-Ostrołęka;
- Passes along some roads not currently expected to change the standard on the expressway (including Ostrołęka, Góra Kalwaria, and Siedlce).

At the local level, road infrastructure of county and communal roads is of key importance. Their distribution is highly varied in space. In general terms, however, it refers to population density. Already in 1999, in addition to Warsaw metropolitan area, networks of north-western part of the province were characterised by higher density. Subsequent years brought little alignment of the gap, mainly through the development of networks in the western and southern parts of this region. Clearly lower saturation with local roads remained in the eastern part of the region. In the years 1999-2009, the largest increase in the density of local roads was observed in the sub-regions of western and eastern Warsaw, followed by Radom. The density in the other two sub-regions did not undergo any significant changes.

Modernization, including lying new, or replacing old surface on county and communal roads has been decisive for the development of the network. The scope of such investment was significant, it was carried out using both, own resources of local governments and external funding (national and from the European Union structural funds). In some counties, flood funds had a significant importance (especially in 2010). Between 5% and 30% of county roads have been modernised in the last five years. The positive effect of this favourable trend, however, has been limited by the following facts:

- Excessive fragmentation of investment, difficulties in communication between adjacent units;
- Replacement of the surface did not guarantee the sustainability of investments, especially in the context of road use by heavy goods vehicles;

- Lack of complementarity between investments carried out on national and regional roads, sometimes causing heavy transit traffic to be redirected from the main road to a lower level road.

Mazovia **railway infrastructure system** is even more dependent on historical factors than road infrastructure. In the transition period (after 1989), only one new railway line has been opened in the region, namely a 2 kilometres line connecting Warsaw airport Okęcie with the railway network. Last major investment before that was the construction of the Central Railway Line in the direction of Krakow and Upper Silesia - in the 1970's. At the same time, some railway lines were closed or suspended.

In 2010, the length of railway lines in Mazowsze region was 1,683 km, of which 1,016 km were double track and 1,412 km were electrified. The network density was 4.7 km per 100 km², being among the lowest in the country. However, its high average level was largely derived from high density of tracks in Warsaw (18.8 km per 100 km²). Indicators for other regions were abnormally low. Seven counties, located mainly in the northern and south-eastern part of the region, were completely lacking railways. The highest density of railway network was observed in the central zone of Mazovia.

At the moment, the most important lines intersecting the region are routes: E20 (Berlin and Poznań to the border with Belarus, with a bypass for freight traffic from Łowicz CE20 through Góra Kalwaria to Łuków), E65 from Gdańsk via Warsaw, and on the Central Railway Line - in the direction of the Upper Silesian conurbation. Both of these passages are concentrating most current investments in rail transport in Poland. In addition, an important role is played by lines E75 (from Warsaw to the Lithuanian border, part of Rail Baltica, which is a priority for the European Union transport) and line 8 from Warsaw to Radom and Kielce. Both of these routes are repaired only on sections adjacent to the capital. In the latter case, the focus is on the section connecting the capital city of Warsaw with the Okęcie airport. With the use of the EU funds, the second phase of modernisation of the Warsaw-Łódź (section within Mazovia) railway line is implemented. Modernization investments, however, are not carried out between Warsaw and Lublin and Kiev, which is one of the biggest bottlenecks of Mazovia railway system (single-track section Otwock-Pilawa).

3. SOCIAL SERVICES OF GENERAL INTEREST

Kindergartens are the first stage of formal education, which is implemented in kindergartens and pre-school classes in primary schools (classes are mandatory for children - one year before primary school). The access to kindergartens is described by the participation rate of children in pre-school/ kindergarten education. The indicator expresses a percentage of children attending pre-school or kindergarten unit attached to primary schools in the total number of children aged 3-6 years. An important advantage of the indicator is its complexity, because, on the one hand, it shows saturation level of child care facilities, and, on the other hand, it indicates the level of schooling among the youngest group of children in the education system.

Overall, the rate of preschool enrolment in Mazowsze region reached 71% in 2009. The distribution of these values is very different, depending on the functional structure of individual municipalities. The highest percentage of children attends kindergarten in Warsaw (94%). This proportion is also high in areas located in the proximity of Warsaw. In this area, in the last 10 years a number of private kindergartens were opened thanks to the EU funding. The lowest value of the analysed indicator is observed on peripheral areas of the region. A clear polarization of the level of participation of children

in pre-school education is noticeable. A sharp increase of indicator values within last few years, comparable to Western European countries, took place in Warsaw and its suburban area, as well as in other major urban centres of the region. On the other hand, in peripheral rural areas, stagnation in kindergarten provision and an increase of the gap in relation to more urbanised areas is observed. The initiatives to support the funding of private kindergartens are currently limited almost exclusively to large cities and suburban areas. In rural areas, the investment risk is much higher, so funding private kindergartens is sporadic.

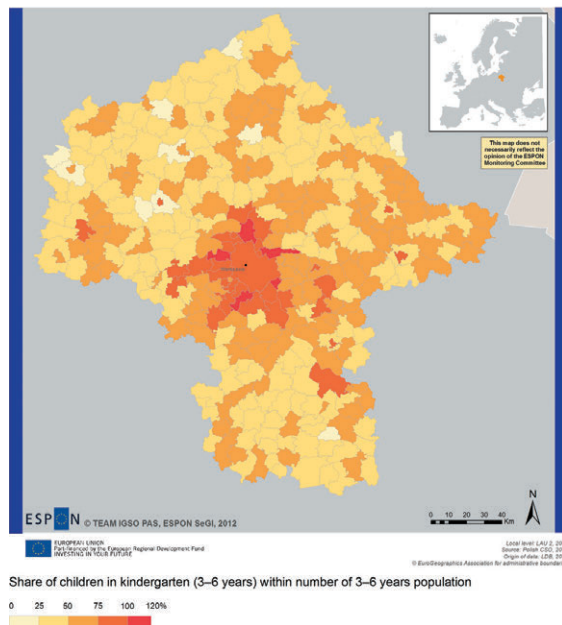


Figure 9. Share of children in kindergartens withing number of 3-6 population

Primary and lower secondary education (grammar schools) is a task of local government. Therefore, facilities of such type are spread out among communes of the whole region, and the availability of primary and grammar schools is common. The prevalence of primary education even in 1970 was 99.7%. The pupils from the cities have a much larger choice of primary and grammar schools. In addition to public schools in the cities there are also units administered by various associations and community organisations. The largest share of these facilities among all schools (of this level) was recorded in Warsaw. A relatively small percentage of these institutions are located in sub-regional and county centres as well as in suburban area of Warsaw. In other areas, virtually all schools are run by the local government.

The surveys carried out in the communes of the region shows that in 96% of them children are brought to school by car, including every third local government operating a shuttle service beyond the statutory obligation and including additional categories of children. Very interesting results were obtained from an analysis of the percentage of children brought to schools (and kindergartens) by buses, depending on the type of function of communities. The largest share of pupils brought to school by bus is observed in peripherally located agricultural communes, where three out of four grammar school pupils must commute in order to receive education. This is because an average of 1.4 schools

per community operate in these communities. Schools are usually located in the centre of commune. On the other hand, in the municipalities of the suburban area of Warsaw, where on average there are 4 grammar schools per municipality, only every 10th student has to commute. The best situation in this respect is observed in the sub-regional centres of the region and in Warsaw, where a slightly lower percentage of pupils commute to primary schools. This is due to the fact that on average in the commune there are about five primary schools.

In Mazovia there are nearly 900 **secondary schools** of different types, of which 41% are general secondary schools, 24% technical schools, 17% vocational schools, 11% specialised secondary schools, 5% art schools, and 2% other schools. One in three of these schools is located in Warsaw. Secondary education remains the responsibility of the county level administration and, therefore, most schools are located in county centres. Of secondary schools of the four major types - 63% of general secondary schools are located in a town which is a county centre, the corresponding figures for technical schools, vocational schools and specialised secondary schools are 62%, 62% and 73%, respectively (Warsaw was omitted in this calculations – if Warsaw was included, the concentration of schools in major centres would be even higher, instead of 64% it would be 74%). It should be noted that in comparison to 1970, there was a slight dispersion of secondary education facilities in Mazowsze region. Forty years ago, within the present border of the region 650 secondary schools operated in the four analysed categories, the concentration ratio in current county centres was 82% (including Warsaw), and 70% without the capital.

The highest polycentricism in the distribution of high schools in 2010 could be noticed in counties located around Warsaw. In counties located further away, especially in the vicinity of Płock, Radom and Siedlce, a clear concentration of secondary education institutions in the major towns of the county can be seen. In several counties, all secondary schools are based in county centres. The higher the concentration of schools in the county centres, the greater the proportion of students that have to commute from other communes to the central town. The alternative for these pupils is to use dormitories and boarding houses, although there are only a few such institutions in Mazovia currently.

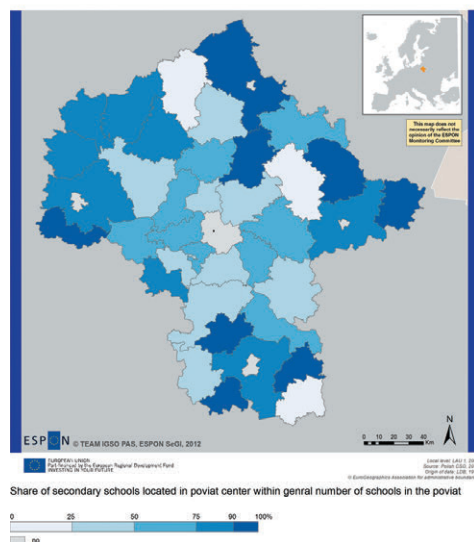
In 2010, the structure of secondary school graduates in Mazovia (excluding special schools) was the following: 60% were graduates of high schools, 21% of technical schools, nearly 13% of vocational schools, 6% of specialised secondary schools, and around 1% of art schools. There is a noticeable increasing trend towards general education, giving the right to continue education at tertiary education level. These processes are even more noticeable when we take as a reference period the beginning of the 1990's. At that time, at the national level, only every fifth student was educated at a general secondary school, and every third at a vocational school.

In the case of graduates of general secondary schools, the dominance of Warsaw and its nearest surrounding is visible, with a clear focus on the west part of the region. Spatial variations occurring are related to several factors. Firstly, the availability of secondary schools, and later of higher education, is important. The availability of tertiary education (which is the natural educational path after completing a secondary school) is important, because planning the choice of secondary school can be influenced by the potentially low cost of study, if students live in Warsaw or its surrounding. Another important factor is the level of parents' education. Warsaw and its immediate environment is one of the areas with the highest level of education in the country. Considering that the educational choices of young people generally repeat the educational paths of their parents, the high number of well-educated people will lead to more interest in having education facilities that provide a similar level of education. Another factor contributing to the high proportion of graduates of general secondary education in

Warsaw and its surroundings is the demand (the highest in the country) on labour market for highly qualified staff, which, as mentioned above, is conditioned by good post-secondary education.

Overall, in Mazovia in 2009, there were nearly 7 thousand graduates of technical schools - 35% of them graduated from schools in Warsaw. There is also a high concentration of this type of graduates in Radom (17%), associated with the traditions of education in the professions needed for the local industry. A high proportion of graduates of technical schools are noticed in the northern and southern counties of Mazovia, the lowest - in the central part of the region. The highest share of graduates of specialised secondary schools is observed in the east part of the region. In the capital of the region, a clear downward trend can be observed among schools teaching specific skills after the secondary level of education, for the benefit of general education that provides the basis for further education path.

Secondary schools in 1970



Secondary schools in 2009

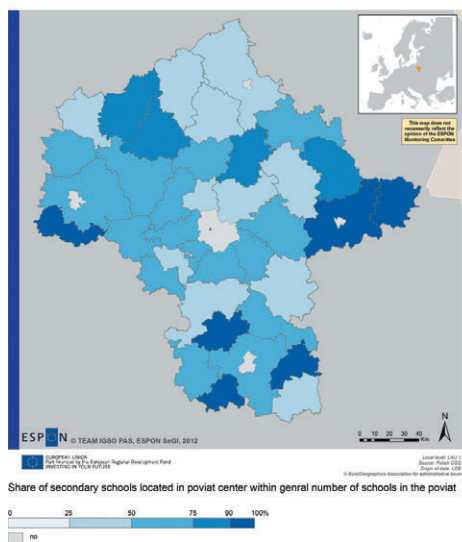


Figure 10. Schare of secondary schools located in county town within general number of school in the county in years 1970, 2009

The findings of the analysis based on statistical data were confirmed in the opinions expressed by representatives of the local government. Assessment of the spatial availability for different levels of education varies significantly. The best spatial availability characterised the primary and grammar schools - such high rating is due to the fact that they are located in each municipality, and in most cases, not only in the centre of a commune. The availability of kindergartens was rated lower, due to the previously described lack of these facilities in the rural areas of the region.

Primary schools

Secondary schools

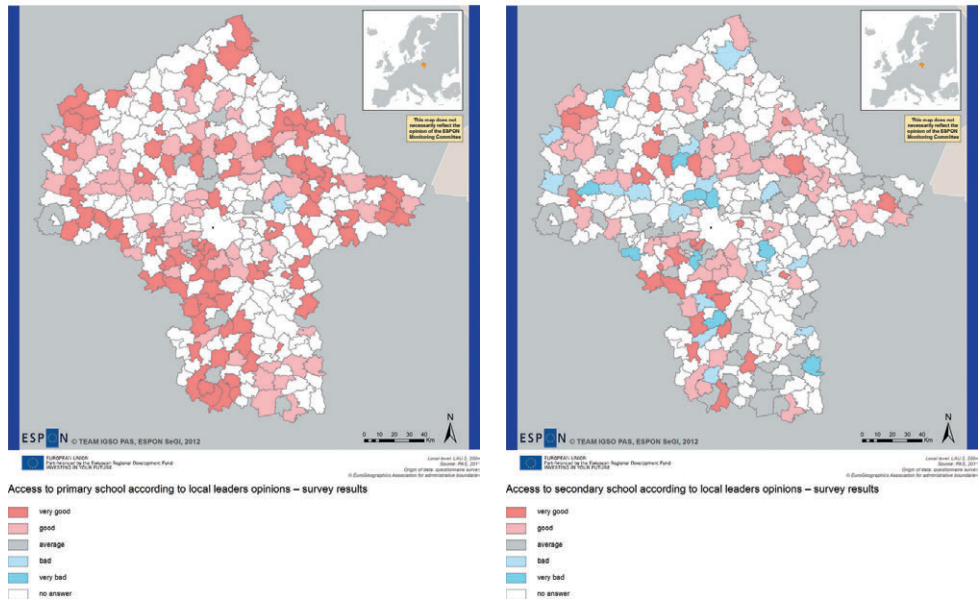


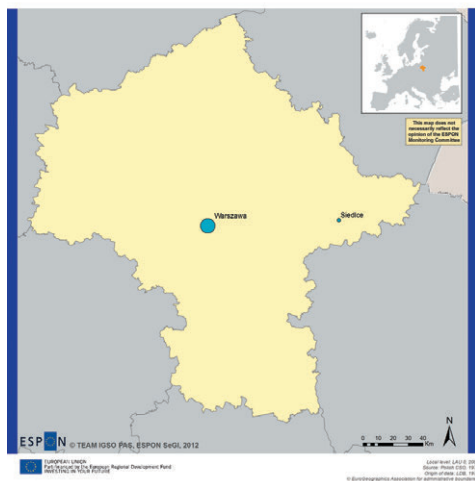
Figure 11. Access to primary and secondary schools

In 2010, 107 **tertiary education facilities** (including branches) operated in Mazowsze region. They were located in 20 cities. Dynamic changes in higher education, in particular in its accessibility, began to take place after 1990. Universities gradually began to appear in smaller towns, with the largest increase in the areas surrounding traditional academic centres (like Warsaw). This was due to the limited mobility of academic staff, associated with academic centres, as well as to the creation of new universities in places of greatest demand. Both now and in the past Warsaw clearly dominated over the remaining academic centres in the region. This is due to the high potential of public, but also private, tertiary education units in the capital. In 2002, 68 schools located in Warsaw registered almost 300 thousand students (80% of the total number of students in the region, and 16% of the total number of students in the country). Four other cities can be pointed out in Mazowsze region that have a noticeable share of students - Radom (7% of the total number of students in the region), Płock (4%), Siedlce (4%) and Pułtusk (3%).

Mazowsze voivodeship, like other regions in the country, is characterised by a very monocentric structure of higher education facilities, although a minor role in the academic structure of the region is played by sub-regional centres (Radom, Siedlce, Płock). Despite the extensive changes in the network of higher education facilities in the region (which coincide with nationwide changes) and the apparent increase in de-glomeration of tertiary education facilities in the region after 1990, the overwhelming dominance of Warsaw can still be observed - the largest academic institutions not only of the region but of the country are located in the capital city. It is true that during the last few years the number of universities has increased significantly in Mazovia (from two in 1970 to twenty in 2010). However, the concentration of students in the most prestigious public universities in Warsaw remains at a very high level. Thus, despite the relative increase in the number of places in the whole region where tertiary level educational services are provided, there is still a clear concentration of universities in Warsaw. In

this case, the existing differences should be seen as positive ones, because only the largest universities with a long tradition can provide high quality education at the tertiary level. Concentration of a large number of tertiary education facilities may also have a significant effect in terms of more potential for developing interdisciplinary learning process - for example, a choice of two or three courses. Concentration of educational and economic potential, moreover, creates opportunities of acquiring practical knowledge (internships).

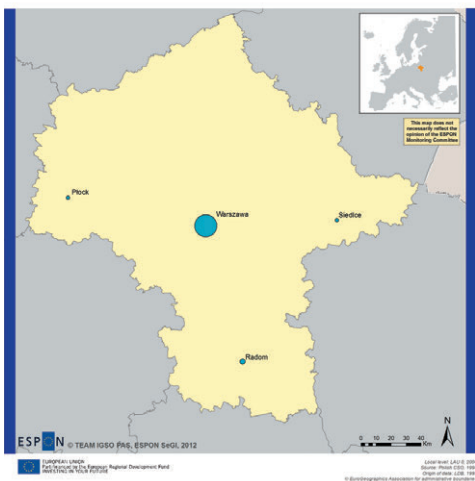
Tertiary education in 1970



Number of tertiary education facilities



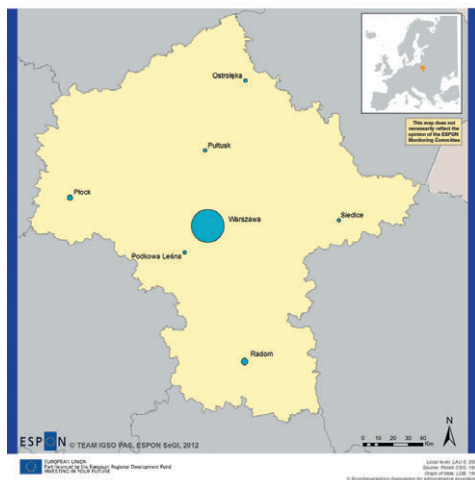
Tertiary education in 1993



Number of tertiary education facilities



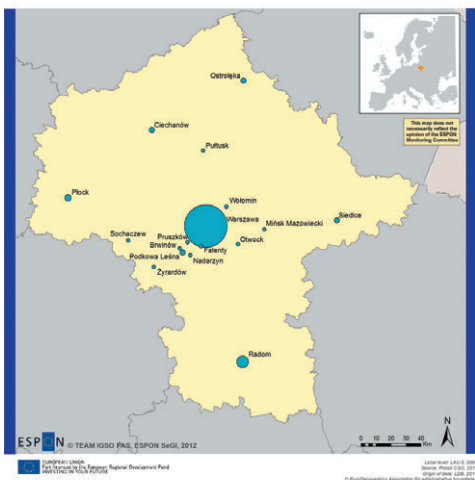
Tertiary education in 1996



Number of tertiary education facilities



Tertiary education in 2010



Number of tertiary education facilities



Warsaw 77 tertiary education facilities

Figure 12. Number of tertiary education facilities

Comparing the number of students and graduates in the Mazowsze region in 2005 and 2010, the tendency of decrease in the number of students is clearly visible. This is a consequence of a decline in population in age groups when people usually attend schools. However, a much larger relative decrease in the number of students can be observed in small academic centres, and much smaller in Warsaw. This means that the process of reducing the number of students affected centres with lower reputation, which offer a smaller range of educational and non-educational opportunities in comparison to the capital of the region. Thus at the labour market the most valued employees are those with a good degree of a public university located in Warsaw. That is the reason why despite an overall decline in the number of students, the process was less noticeable in the universities of Warsaw, and much more in those located in Radom, Płock, Siedlce or Ciechanów. It is expected that after a period of certain academic de-glomeration in Mazovia (although, as it has been mentioned, it was to some extent an apparent phenomenon), a process of concentration of students at universities in Warsaw will take place. Reducing the number of students in tertiary education facilities located in smaller centres will lead to their liquidation. This process is linked with socio-economic development in Mazovia in two ways. Firstly, the contemporary dominance of tertiary sector of economic activities (services) in Warsaw generates demand for employees with higher education. In smaller towns, the supply of jobs is not so high, therefore, students prefer universities in Warsaw, as they can earn internships and get work experience while still studying. In addition, the development of a Warsaw based university contributes to the development of associated services (e.g. accommodation, dining, entertainment, public transport, etc.), which is an important generator of development. Secondly, the loss of academic functions by smaller centres will result not only in weakening their prestige and slowing the development of human capital, but also can result in the liquidation of some of the companies whose main customers were students.

Raising professional skills is decisive for success in the labour market. Mazowsze region is a leader in terms of share of **people learning and increasing their skills** in the age group 25-64 years (7%). Although this figure is lower than the EU average (9%), it is much higher than in other Polish regions. Different types of training courses are organised by the District Labour Offices located evenly in the region (in each of 42 counties). However, also a number of private institutions pursue such activities commercially. In Mazovia, there are more than 1,500 training companies - of which almost 800 operate in Warsaw, which represents 55% of the group. Another 15% are located in the sub-regional centres (Radom, Płock, Siedlce, Ostrołęka, Warsaw), and 10% - in the suburban zone of Warsaw, which is clearly visible on the map. The smallest number of training facilities are found in suburban municipalities, sub-regional centres, and in peripheral areas (mainly rural). From the perspective of region structure and spatial differentiation, this situation leads to the conclusion that demand is an important factor influencing the development of such facilities (larger population, higher population density, and more options for companies in terms of premises, equipment and staff). Large cities and their immediate neighbourhoods enable to acquire students/customers as well as staff able to conduct courses and training. Areas lacking the ability of benefiting from training facilities are disadvantaged - on one hand, they are mostly areas with poor human resources (in terms of quality), and on the other, they lack institutions that can offer training to increase qualifications. Therefore, it can be concluded that adult education is undergoing an on-going polarisation. Residents of Warsaw and its suburban areas as well as of several large cities of the region have, on one hand, the best education, and on the other, they have access to the largest number of training institutions. Thus, residents of these areas have the greatest opportunities to improve their skills and increase their potential in the labour market. Nevertheless, in addition to the above-mentioned conditions associ-

ated with the development of such facilities in the central region (such as infrastructure conditions, supply and demand for staff training on the part of residents and businesses), it should be noted that the development of Warsaw generates a demand for well-educated and flexible employees who can adapt to changing conditions. Thus, it can be concluded that the general economic situation of Warsaw Metropolitan Area stimulates the creation of new training institutions.

In 2010, 24 **theatres** were functioning in Mazovia, 22 of which were based in Warsaw, and the other two were located in Płock and Radom. In addition, in Warsaw there is only one philharmonic hall and two chamber orchestras and symphony orchestras, and one in Płock and Radom each. In 2010, all performances and concerts gathered over two million viewers (almost 1.9 million in theatres). In general, an increase in the number of viewers in theatres in the last few years can be observed. The level of participation of people in the region (mainly in Warsaw and its immediate surroundings) in theatre and music events is almost two times higher than in the rest of the country - this is due to the richer cultural offer and a larger number of shows and concerts, as well as to a higher level of local government income that can be spent on goods of higher order. In addition, in Mazowsze region there are 64 galleries, including 50 in the region capital, and 115 museums, 61 in Warsaw.

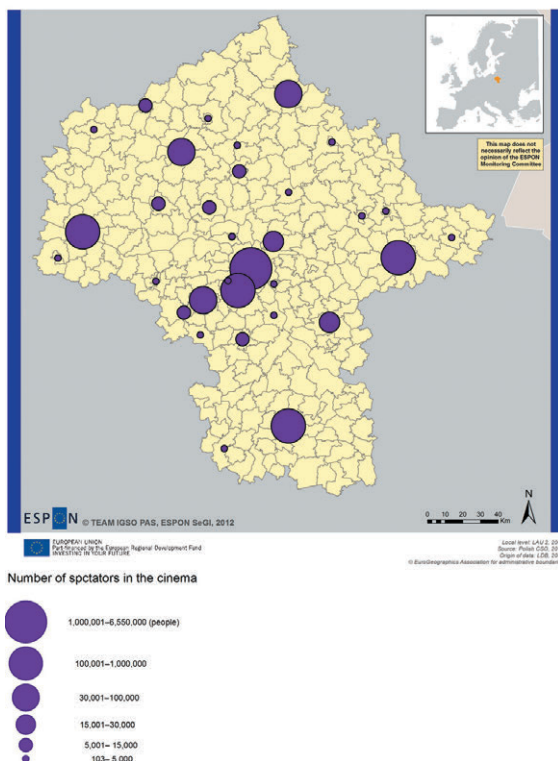


Figure 13. Showings in fixed cinemas

Cinemas are a much more popular cultural institution in the region. In 2010, there were 56 cinemas (about half under the government responsibility, and the other half private). Compared to 1995, a steady declining trend can be observed in the number of cinemas (in 1995, there were 78), accompanied by a steady increase in the number of auditoria and seats. This is due to the construction

of large multiplexes (now in Mazovia there are 10 such objects, with on average 11 auditoria) and closing small art cinemas. While in 1995 the average cinema in the region had more than 800 seats in auditorium, currently average is 5.5 thousand. In Warsaw alone, 12 cinemas were closed during the last fifteen years. Cinemas in Mazowsze region are located in 21 cities. Despite the relatively high polycentricism in the distribution of these facilities, it should be noted that Warsaw cinemas attracted 81% of all viewers (counting the multiplex in suburban village Janki - 86%). The supremacy of Warsaw weakened slightly after the opening of the multiplex in Siedlce, which is an alternative for residents and pupils from the eastern Mazovia (instead of capital). However, the concentration of auditoria, screenings and audiences of Warsaw cinemas will continue to grow.

Community culture centres and public libraries are important institutions, especially in the rural areas of Mazowsze voivodeship. In 2009, there were 256 cultural centres, located in more than 150 municipalities. They run nearly 3,000 artistic groups and special interest groups of different kinds, and have more than 60 thousand members. Moreover, all communes in the region have public libraries - in 2009, there were 991 libraries (of which nearly 200 in Warsaw), offering over 17 million books.

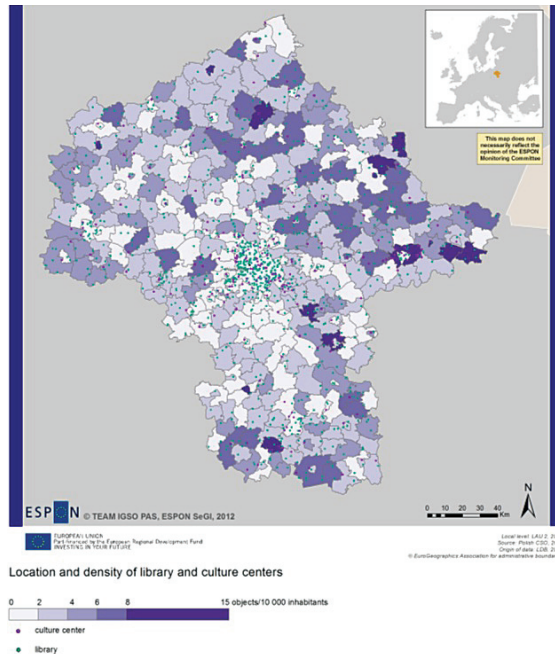
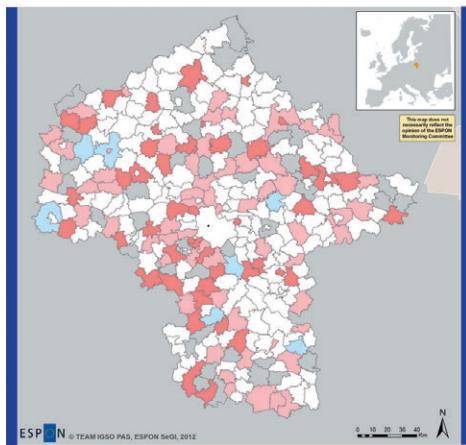
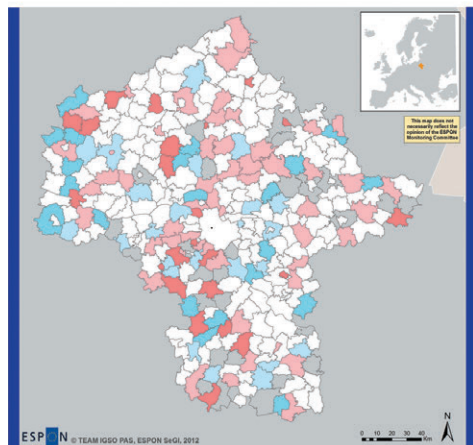


Figure 14. Location and density of library and culture centers

Local culture centres and public libraries are the most widespread cultural and entertainment institutions in the region. Thus, according to local authorities, the spatial availability of these institutions remains high. Due to a much larger number of libraries, the evaluation of their availability is higher than of the availability of local culture centres.

Local culture centers

Libraries



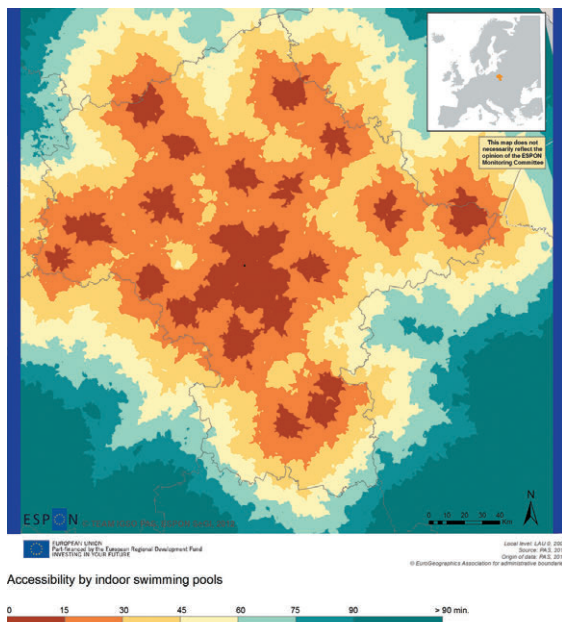
Access to local culture center according to local leaders opinions – survey results

- very good
- good
- average
- bad
- very bad
- no answer

Access to library according to local leaders opinions – survey results

- very good
- good
- average
- bad
- very bad
- no answer

Figure 15. Access to local culture centers and libraries



Accessibility by indoor swimming pools

- 0
- 15
- 30
- 45
- 60
- 75
- 90
- > 90 min.

Figure 16. Travelling accessibility to indoor swimming pools

The participation rate of Mazowsze region residents in sport clubs activities is one of the lowest in the country - this is partly due to the lack of tradition and to the low level of industrialization. However, currently in Mazovia over 100 thousand people are members of sports clubs. In 1999, the corresponding figure was only about 65 thousand. Apart from football, the most popular sport activities are volleyball and athletics. Three out of four athletes are young people under the age of 18. Spatial distribution of sports clubs strongly reflects the settlement structure.

The highest saturation of sports infrastructure facilities in Mazovia is observed in Warsaw. The only facilities that are common in other sub-regional centres are stadiums and pitches (including multi-functional ones). Sports venues, such as ice-rings, indoor swimming pools (including water parks) and tennis courts are rare outside of Warsaw. Moreover, if such facilities exist, they are typically located in county centres, which means that the majority of population in rural areas has limited access to.

An analysis of spatial access to indoor swimming pools in the region indicates that the inhabitants of Warsaw Metropolitan Area as well as sub-regional centres and their surrounding, and of selected county centres enjoy the shortest access to these sites. The worst availability affects the residents of western part of Radom subregion, counties: Przasnysz, Sierpc and Garwolin. In the nearest future, this situation will significantly improve after the construction of swimming pools in Przysucha and Chorzele (northern part of the Przasnysz county). It should be mentioned that the planned investments will be located in areas where provision of this service and its availability is actually the weakest.

In 2010, there were 1,990 **Health Care Centres** (Zakład Opieki Zdrowotnej - ZOZ), of which only less than one in four was a public institution. In the last few years, a significant increase has been observed in the number of health care institutions - in 2010, it was higher by 30% compared to 2004. This increase was mainly due to the growth of private facilities - within seven years, the number has risen from less than 1,000 units to over 1500. This was due to the option of signing contracts with the National Health Fund (Narodowy Fundusz Zdrowia – NFZ) by private service providers, on the same terms as with the public ones. The largest increase of private health care facilities was recorded in suburban area of Warsaw.

The largest number of health care facilities are situated in Warsaw and in other major urban centres of the region. Usually, in rural communes there are 1-2 health care facilities. The indicators of health care service provision based on population are clearly determined by the structure of the settlement network and by population density. In suburban communities, the saturation of healthcare facilities is the lowest; hence the above described trend of increase in the number of facilities in Warsaw suburban zone is due to low supply and high demand, which is further amplified by high rates of growth due to migration. Moreover, low values of indicators in the suburban communes are due to the fact that the inhabitants of these areas are functionally connected with the capital city, and have access to some services there, including health care services. The high rates in remote areas of the region are combined with the fact of low population density, and functioning in almost every commune of at least one general practitioner surgery (in 2010, only 5 communes did not have such a surgery).

An important issue that should be taken into the consideration in the context of the availability and accessibility of health care is the **location of pharmacies**. In 2010, in the Mazowsze region, nearly 1,500 pharmacies were registered. In comparison with the preceding years, a significant improvement can be observed: the whole region has twice as many pharmacies as fifteen years ago. The largest increase has occurred in Warsaw (currently, there are 3 times more pharmacies than in 1995) and in the suburban area of Warsaw. Currently, there is one pharmacy located in rural areas

per about 8 thousand residents, and in the cities of less than 4 thousand. In 77 communes, there was no pharmacy at all, but they were almost exclusively rural communities, with mainly agricultural function. Moreover, despite the increasing trend for the number of pharmacies, ten municipalities (all of rural type) liquidated pharmacies operating there at the beginning of year 2000.

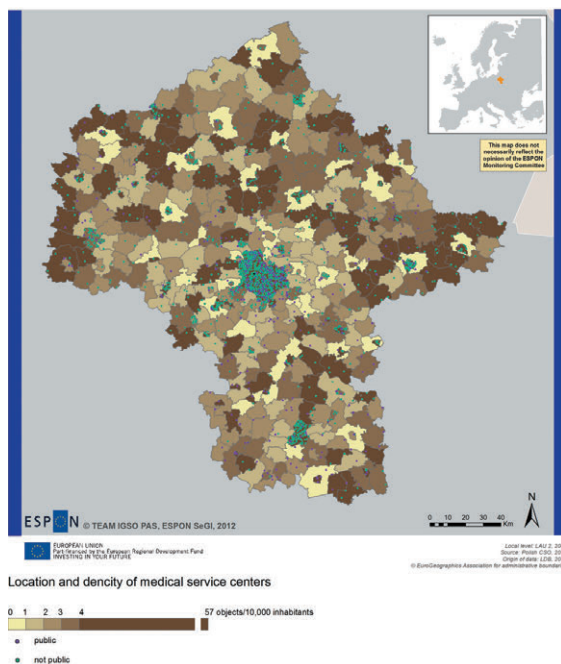


Figure 17. Location and density of medical care service centers

In 2011, according to data from the Ministry of Health, in Mazowsze region there were **85 hospitals** with 776 hospital departments, and nearly 30 thousand beds. About a half of hospitals, as with nearly half of beds, was located in Warsaw - 35 hospitals with more than 14 thousand beds. Other hospitals were located in large cities of the region, especially in county centres. However, there are three counties in the region without hospitals - Białobrzegi, Legionowski and Szydłowiecki. Some hospitals are located in smaller towns, but they are usually specialist units (e.g., Hospital for Mental and Nervous Diseases located in Ząbki). The highest saturation of hospitals and hospital beds is noted in the Otwock county. The Otwock forests have attracted several specialised institutions dealing with tuberculosis.

Isochronal accessibility analysis is derived from the location of the hospitals in county centres. In the central part of the region and around most county centres, the average driving time to the hospital is relatively short, and usually does not exceed 20 minutes. The situation is worst in the peripheral areas (in the county context), which is particularly evident in the north-west (the area within the triangle Płońsk-Sierpc-Mława), east (areas between Ostrów Mazowiecka and Sokołów Podlaski), and in the southern part of the region (east of Białobrzegi). Inhabitants of these areas need at least 30 minutes to drive to the nearest hospital. In the last case, this value goes up to 50 minutes. Despite the apparent „islands” of poorer access to hospitals, travel time to the nearest facility seems to be acceptable almost everywhere in the region.

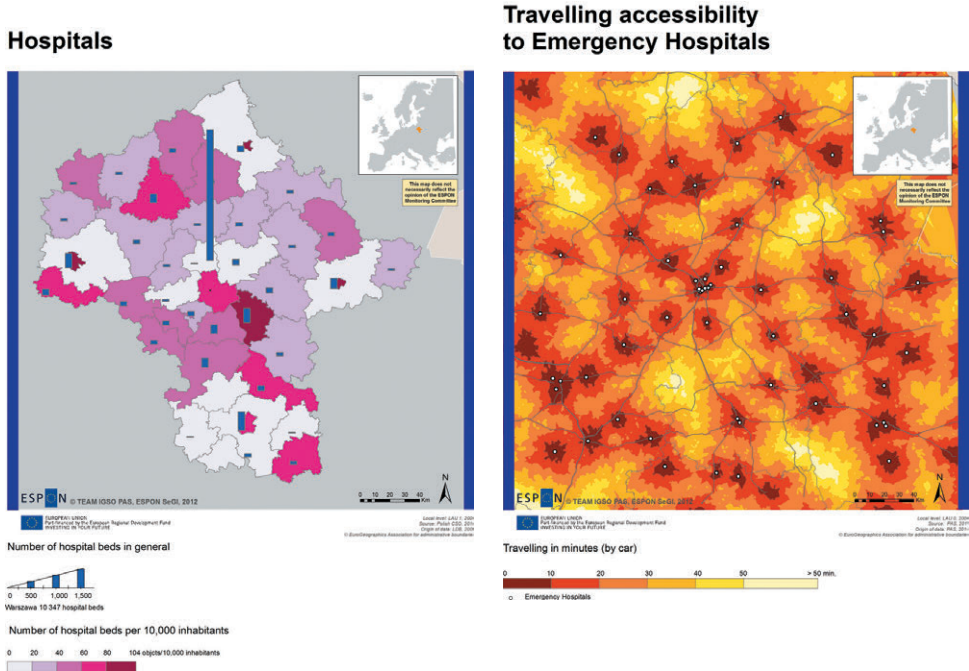
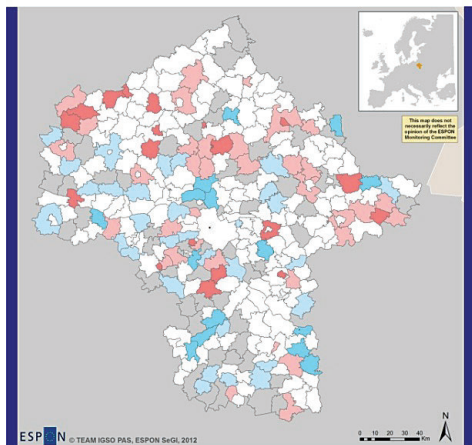


Figure 18. Number of hospitals beds per 10.000 inhabitants and travelling accessibility to emergency hospitals

The basic element of the State of Emergency System is the so called Hospital Emergency Units (HEU). Currently, in Mazowsze voivodship there are 28 HEUs, 9 of which are located in Warsaw. In total, they have 184 beds (67 in Warsaw). Two large compact areas can be pointed out that are likely to have peripheral location in relation to the HEUs: eastern part of the region, between Ostrów Mazowiecka and Siedlce (Sokołowski and Węgrowski counties) and the south-west (north and north-west of Radom: counties Grójecki, Białobrzegi, Żyrardowski and Przysuski). To a lesser extent, peripheral location may affect counties: Żuromiński and Sierpecki in the north-west, and Zwoleński and Lipski in the south. This observation confirms the isochronal analysis of accessibility. It is worth mentioning that in the southern part of the region situation has greatly improved thanks to the presence of HEUs in neighbouring regions. However, there are still areas from which is not possible to drive to the nearest HEU in less than 30 minutes. These areas are home to approximately 20% of the population of the whole region (about 15%, when the neighbouring provinces are considered).

Complementary analyses of accessibility of the Mazovia health and social care facilities carried out among representatives of the local government shows that in general inhabitants of the region do not have too much difficulty with accessing general practitioner surgeries. Similarly, good accessibility is provided to pharmacies and social care institutions (including Social Welfare Centres, operating in each commune). The weakest availability can be observed in the case of hospitals.

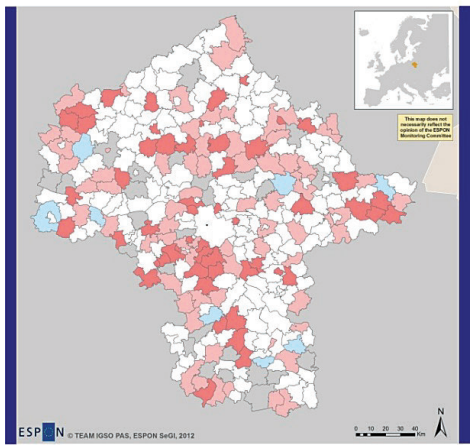
Hospitals



Access to hospital according to local leaders opinions – survey results

- very good
- good
- average
- bad
- very bad
- no answer

Pharmacies

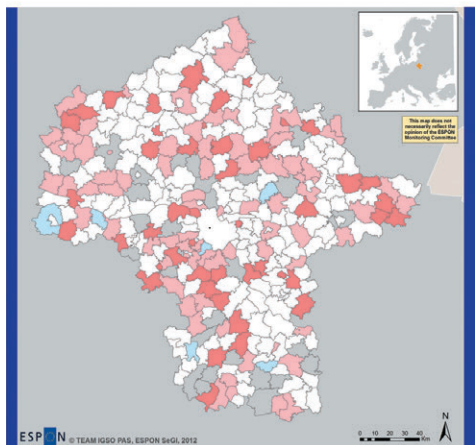


Access to pharmacies according to local leaders opinions – survey results

- very good
- good
- average
- bad
- very bad
- no answer

Figure 19. Access to hospitals and pharmacies

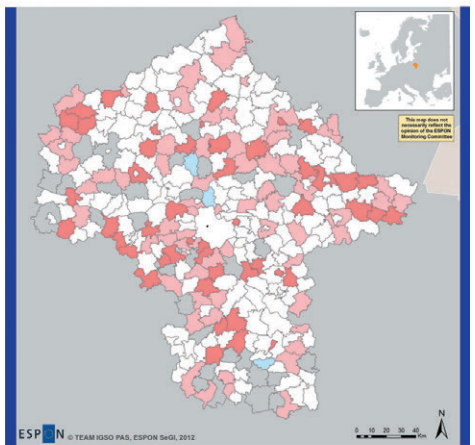
General practitioners/local clinics



Access to general practitioner/local clinic according to local leaders opinions – survey results

- very good
- good
- average
- bad
- very bad
- no answer

Social care



Access to social care according to local leaders opinions – survey results

- very good
- good
- average
- bad
- very bad
- no answer

Figure 20. Access to general practitioners and social care

In the opinion of representatives of local authorities, in most counties of the Mazowsze region social infrastructure facilities are at least satisfactory. In each commune, primary and secondary school, public library, health care facility, post office, and local culture centres operate. In the majority of counties there are county hospitals, secondary schools, banks and the whole range of specialised institutions, such as nursing homes, educational institutions, kindergartens, special schools, family assistance centres, police stations, fire stations (fire fighting), labour offices, educational socialisation therapy workshops, emergency medical stations, psychological and pedagogical teacher training centres, practical training centres, etc.

During the last 20 years, a tremendous increase has been observed in the quality of social infrastructure institutions. It is true that their number has not increased significantly (apart from ICT, banking and commercial services), but considerable financial resources have been invested to modernise (thermal insulation replacement of windows, roof and façade painting) the existing school buildings, hospitals and community centres, and to provide them with art equipment. Currently, schools and health care facilities are the most impressive buildings in the municipalities. In addition, a significant progress has been made in developing sports infrastructure - pitches, indoor and outdoor swimming pools and sports halls have been built. Most of the investment was financed from own resources of communes and counties, however, some of them was acquired the European Union funds or funds from the state budget from Mazowsze Regional Council.

The majority of interviewees expressed an opinion that the spatial accessibility of social infrastructure is quite good, and has improved in the last several years, due to the improvement of transport infrastructure and an increase in individual car ownership. The problem of accessibility still remains visible in the case of certain specialised medical services, located outside of the majority of counties or rendered for payment, which creates financial barriers. Moreover, the accessibility of communications infrastructure is not optimal - it is noticeable that internet access in certain areas of the region is not sufficient. In all counties, the inhabitants of county centres enjoy best accessibility to social infrastructure and public services.

The most important conclusion from the analysis of the distribution and availability of social and economic services is the gradual commercialisation of certain institutions. In recent years, a considerable number of private kindergartens, pharmacies and health clinics were opened in the region. The increase, however, mainly focuses on areas with higher demand for these services, mainly in Warsaw (and its suburban areas) and in other major cities in the region. In other areas, stagnation in the provision to social infrastructure facilities can be observed, which leads to deepening of intra-regional disparities, with the largest supply of educational institutions, as well as health and recreation facilities in areas of greatest demand. A very important determinant of the development and transformation of social infrastructure facilities in the future will be demographic processes - gradual decline in the number of children and young people reduces the need for opening new kindergartens and schools, and an increased share of older people in the population structure will force the need for hospitals, other health care facilities, and social security.

4. CONCLUSIONS

Emblematic turning points in the history of Poland affected the whole political-socio-economic context of the country. These have also impacted the provision of services of general interest in the country. Poland was a divided country before the First World War, was united in between wars,

devastated during the Second World War, redeveloped under a central planning communist system, and transformed after the transition into the market system after 1989.

The facilities and infrastructure for the provision of services of general interest were also devastated during the Second World War. Their reconstruction, although centrally planned and with communist aims of universalisation, faced limited resources, and thus lacked investments. Therefore, even though the universalisation of electricity access within all Polish territory was achieved, same as adequate provision of some social services of general interest, the country presented a degree of regional differentiation in two main areas: SGI were better provided in the western part of the country while rural areas faced scarcity of such provision.

The development of SGI in Poland got strength after the transition, with the increase of investments that followed the opening of the economy for market services, foreign investment, and private provision of SGI. In this sense, technical infrastructure in particular gained momentum and was extended to rural areas, as observed in the cases of water and gas pipelines, which have increased largely in rural areas after the transition.

Also in this period, private SGI providers entered the scene in Poland. This was observed mainly in public transport, telecommunications and some social services, notably in education and health services. Private kindergartens took over the space left by closed public kindergartens in places where the dispersed settlements made them financially unfeasible. An increase in the number of private providers in higher education was also observed, especially in areas of academic concentration (which resulted in concentrated demand). The raise of private health clinics, an essential social service, has also been remarkable. However, it must be observed that private providers seek profit whereas essential services should be provided for all inhabitants. The increased private provision of SGI raises high socially exclusionary dynamics. If schools were not financially feasible for public provision, it is estimated that the profit-driven private service will be expensive, and possibly with low quality if in an environment with no competition. Such expensive services keep at a bay all the low income groups of the populations, which are generally those in more need of services.

In 2004, Poland joined the EU, and this event had two major impacts regarding SGI. Firstly, the country became entitled to use the EU funds, markedly the structural funds, and its resources for investment in expansion and modernisation of SGI. New investments in services (especially infrastructurally based services: water pipelines, sewage systems etc.) are taking place thanks to the EU funds. Secondly, Poland became subject to the EU regulations for services and markets, including (soft or hard) regulations on the provision of SGI in terms of liberalisation, deregulation and privatization of services. Governments in Poland still find it hard to build the internal capacity to properly regulate and control the provision of essential services being by private companies. Public-private partnerships and cooperation are rather rare.

Such new EU regulatory requirements raised also challenges, for instance environmental, which remains a problem in Poland as well as in the region of Mazovia - sewage systems and sewage treatment facilities are still lacking both in the country and in the region. The relation between infrastructure and economic development raises also a challenge, with the modernisation required in countries of Eastern Europe, including Poland. The EU accession and the resulting position of Poland at the eastern border of the Union further deepened the east and west differences observed in Europe and within Polish territory. The opening of western borders and further closure of eastern borders has increased the poverty and scarcity of SGI of eastern Poland.

Notwithstanding the investments brought by market opening and the EU accession, Poland has also got more vulnerable to external economic shocks, and investments have been reduced with

the economic crisis starting in 2008. This concerns primarily central investments but expands also to the local levels, which are traditionally more fragile economically, and affects the capacity of investment in costly infrastructure of services like health, rail and road transport, water pipes, telecommunications, education. Major road projects and transport accessibility are more affected than local undertakings in the sphere of social infrastructure.

In demographic patterns, Poland also followed European standards and is facing demographic changes as the aging of the population, imbalance of gender structure, and an increase of peripheral areas suffering from depopulation. The changing family model results in the need of care for children (kindergartens) and the elderly (nursing homes). Changes in citizen's preferences and behaviours have also had some impact, for instance, changes in transport needs and uses resulted in an increasing role of individual transport (in an inverse correlation with the quality of public transport). This process is especially observed in the Mazowsze region, where growth of individual journeys is not only a consequence of the rapid suburbanisation and motorization, but perhaps mostly of the de-concentration of jobs that were previously supported by public transport. Another new behaviour regards cultural activities, which is exemplified by a mass-consumption pattern in culture: small art cinemas are closing, while large multiplexes in shopping malls are being opened. The agglomeration pattern of services provision is observed even in cultural services in Poland.

Demographic and urbanisation structures, as well as the structure of settlements, were found to be a crucial issue in the provision of SGI in Poland. As the regional case study involved the capital city of Poland, which forms its bigger agglomeration (and consequently has higher population density – i.e. higher demand for SGI), our study portrayed the emblematic tensions concerning the territorial distribution of services between the capital region (or regional centre) and rest of the country/region. Warsaw and its surroundings represent this contrast with the rest of the Mazowsze region and with the country in general.

Therefore, a main finding of this ESPON research concerns the distribution of SGI, which are concentrated in areas with high demographic density. Services are often centralised in agglomerations and centres of counties and towns (e.g. education, health service, telecommunications, sewage, etc.). Economies of scale privilege large towns, the larger the agglomeration, the larger the incentives of services providers to serve the region. Small towns/villages find it hard to provide service in remote areas or to maintain high quality services due to their financial feasibility.

In the Mazowsze region, there a strong polarisation is observed between rural and urban areas. Examples of such tension regard mainly technical infrastructure, especially sewage treatment in rural areas – although this has increased immensely after the accession to EU. However, the region remains without any provision of gas supply. The region faces deficiencies in the provision of public transport too; such deficiencies include uncovered areas, faulty time tables, etc., and the solutions fostered are generally based on private cars without innovative solutions, such as shared or electric cars, instead of improving public transport. Moreover, climate change and changing weather patterns are provoking a need to improve the technical infrastructure. In Mazovia, the capacity of drainage systems must be improved, since it is not sufficient. It must be stated that rural areas are not more deprived in terms of SGI; they are also more vulnerable because of their higher poverty, when compared with the wealthier area of Warsaw.

Policy recommendations, in this sense, are to pay attention to social and territorial balance of SGI moving far beyond solely taking into account the profitability of the services. This is achieved by centring efforts on public coordination of SGI provision, no matter if the provider is public, private or hybrid. Such multi-level coordination is imperative to organise and distribute cross-subsidies that will

curb unmeasured profit seeking in agglomerations, and guarantee the means for financing services in remote, mainly rural areas.

Editors' note:

Unless otherwise stated, the sources of tables and figures are the author(s), on the basis of their own research.

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