

EU-LUPA

European Land Use Patterns

Applied Research 2013/1/8

VOLUME IX

Jeleniogórski Subregion, Poland Case Study Report

Part C Scientific report |

Version 30/November/2012

This report presents the final results of an Applied Research Project conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

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1. INTRODUCTION TO THE REGION

The main focus of the case study is the Jeleniogórski subregion (according to NUTS 3 classification – its code is PL515) located in south-western part of Dolnośląskie Region in Poland.



Fig. 1. Division of Poland into the NUTS3 units and division of the Jeleniogórski subregion into counties (LAU1)

Source: own work and the Central Statistical Office of Poland (www.stat.gov.pl).

At the beginning of the report the administrative division of Poland should be briefly described. Since 1999, the administrative division of Poland has been based on three levels of territorial subdivision. Thus the territory of Poland is divided into 16 voivodeships (regions; NUTS2); these are further divided into 379 powiat-units (counties; LAU1), and these in turn are divided into almost 2500 gmina-units (communes or municipalities; LAU2). Each of the tiers of the government and self-government has very precisely designated responsibilities, legal status, authorities, budget and other things. According to that system, such areas as subregions (NUTS3) do not have any legal and administrative responsibilities. In Poland, the NUTS3 subregions are only

statistical units created from groups of counties (LAU1), but always within the borders of one of the regions (NUTS2). It is very important to mention it at the beginning of the report, because the general recommendations of the land management should be based both on a more general level and addressed to regional authorities and also prepared on a more locally diversified and oriented level and addressed to counties' authorities, since the conclusions for subregional level do not have any legal addressee.

Also, there is one more thing that should be mentioned in that part. The Jeleniogórski subregion was created in 2007, when in Poland the correction of statistical units on NUTS3 level was made. Before 2007 there were 45 units, and after the correction - 66. Till 2007 there existed the Jeleniogórsko-wałbrzyski subregion (PL511), but after the correction, two separate subregions were established: Jeleniogórski (PL515) and Wałbrzyski (PL517). Because of the aforementioned change it is impossible to conduct some dynamic analysis in a long time series.

The Jeleniogórski subregion consists of 9 counties – the biggest town being Jelenia Góra (84,000 inhabitants). In total the subregion has 575,000 inhabitants (as of 2010), which is ca. 1.5% of Poland's population. The surface of the region is 5,570 km², and the density of population is 103 people per km².

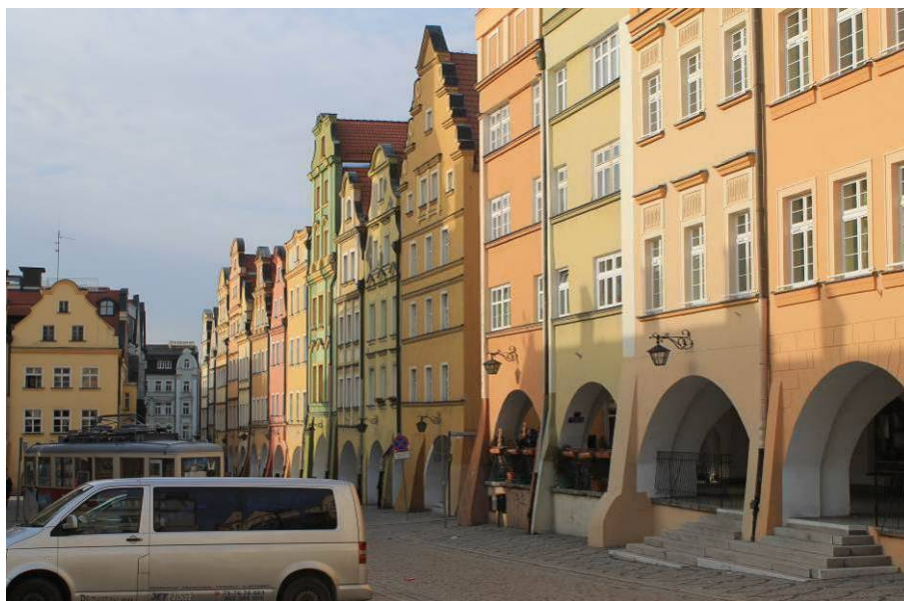


Photo 1. Old Market in Jelenia Góra.

Source: author's own materials.

The most important characteristics of that subregion can be listed as below:

- Borderland location – borders with the Czech Republic in the south and with Germany in the west;
- Diversified landscape – in the southern part there are the Sudety Mountains, with its highest range - the Karkonosze (the highest mountain – Mt. Śnieżka 1602 m a.s.l.) and in the northern part there are lowlands;
- Hugely diversified land cover and diversified land use functions as well;

- Relatively high rate of unemployment, resulting from the transformations of the industrial sector that has taken place during the last 20 years;
- In the past, problems with big pollution;
- The increasing role of tourism in southern part of the subregion.

The analysis in the report is based mostly on the statistical data and literature review.

The report will centre on three spatial levels – all of these being subjected to detailed investigation.

- Some of the analysis will be made for the area of the Jeleniogórski subregion in relation to regional and national average.
- Some of the research will focus on intraregional diversification of the Jeleniogórski subregion, concentrating on spatial units of counties and communes.
- And also some of the analysis will be made, based on a very detailed spatial resolution – making use of the data from the Corine Land Cover and providing some examples of a very detailed location of some elements of spatial organization (settlements, industrial districts, arable lands, forests, roads and other elements).



Photo 2. The Karkonosze – the highest range of the Sudety Mountains.

Source: author's materials.

But also very important data and information were collected by the author during the field studies in the Jeleniogórski subregion in the periods: 3-7 March and 26-28 April 2012. During the study four interviews were conducted with:

- Jolanta Borejszo and Włodzimierz Słodkiewicz – Secretary and Vice Secretary (Director of the Organizational and Legal Department) in the Office of the Jelenia Góra County.

- Prof. Jacek Potocki – professor at the Wrocław University of Economics – Branch in Jelenia Góra, member of the Scientific Council of the Karkonoski National Park and member of the Advisory Group in the Marshal Office of Dolnośląskie Region, specialised in the tourism analysis.
- Dr Sylwia Dołzbłasz – researcher in the Institute of Geography and Regional Development at the Wrocław University, specialising in the trans-border and transnational analysis, especially on the border with Germany and Czech Republic.
- Dr Helena Dobrowolska-Kaniewska – head of the regional analysis units in Dolnośląskie Agency for Economic Cooperation (DAWG) – agency carrying out European and regional projects and co-operating with the Marshal Office of Dolnośląskie Region.

At this point the author would like to express his special thanks for the interesting interviews.

2. CHARACTERIZATION OF LAND USE AND LAND COVER

2.1. Definitions of land use

In this report it is very important to define two terms: land cover and land use.

The first one corresponds to a physical description of space, the observed (bio)physical cover of the earth's surface (di Gregorio, Jansen, 1997). It is the one which overlays or currently covers the ground. This description enables various biophysical categories to be distinguished - basically, areas of vegetation (trees, bushes, fields, lawns), bare soil (even if there is a lack of cover), hard surfaces (rocks, buildings) and wet areas and bodies of water (sheets of water and watercourses, wetlands). This definition has impact on development of classification systems, data collection and information systems in general.

As for the second one, various approaches are proposed in the literature. There are two main "schools" of thoughts that may be distinguished. Land use in terms of functional dimension corresponds to the description of areas in terms of their socio-economic purpose: areas used for residential, industrial or commercial purposes, for farming or forestry, for recreational or conservation purposes, etc. Relationships with land cover are evident; that is it may be possible to infer land use from land cover and conversely. However, situation is often quite complicated and relationships not so obvious. Another approach, termed sequential, has been particularly developed for agricultural purposes. It can be defined as a series of operations on land, carried out by humans, with the intention to obtain products and/or benefits through using land resources. Contrary to land cover, land use is difficult to "observe". The information coming from the source of observation may not be sufficient and may require additional data.

2.2. Surface and structure of land use

Surface and structure of land use is strictly connected with topography of the Jeleniogórski subregion (Figure 2). The physical structure of land in this subregion is highly diverse. In the southern part there are the Sudety Mountains – the old chain of mountains lying on the border of Germany, Poland and the Czech Republic. The Sudetes are divided into many ranges – the average altitude for these ranges is approximately 1000 meters, however the highest range – the Karkonosze – is about 1300-1400 meters with the highest mountain summit - Mt. Śnieżka (1602 m a.s.l, this being at the same time the highest mountain peak of the Czech Republic. Than more to the north, there are uplands – diversified landscape with the small hills – around 300-600 meters. Then, the more to the north of the subregion, the average altitude is lower (around 100 meters). In that subregion we can notice only few lakes – mainly in the mountainous part or artificially created on the rivers by building the dams. The longest and the most important rivers in the analysed region are Bóbr, Kwisa and Nysa Łużycka.

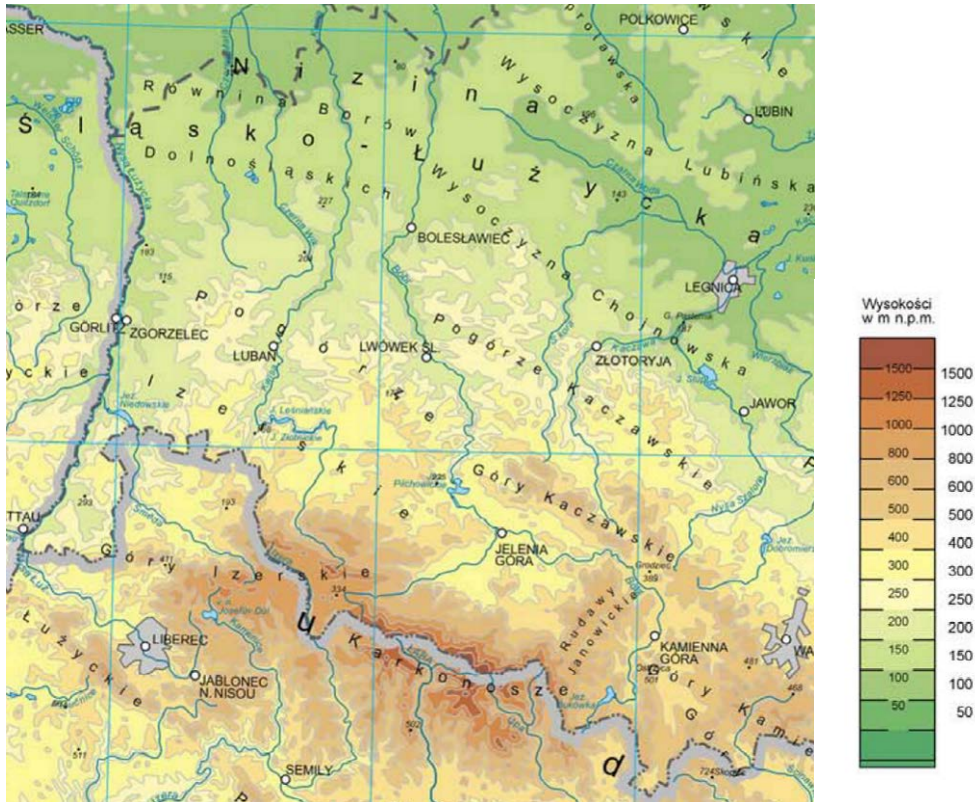


Fig. 2. Hypsometry of the Jeleniogórski subregion

Source: <http://eko.wbu.wroc.pl>

About 88% of the land in the Jeleniogórski subregion is covered by agricultural land and forests. Such amount is comparable with the national and regional average. But what is specific for the Jeleniogórski subregion is a higher proportion of forests. On average in Poland and in the Dolnośląskie Region the share of forests is around 30%, while in the analysed subregion it is almost 40%. Such amount is correlated with two important factors – a diversified landscape and high proportion of forests in the mountainous part of the region in the south and a poor quality of the soils in the north, which are covered by the biggest compact complex of forests in Poland – Bory Dolnośląskie.

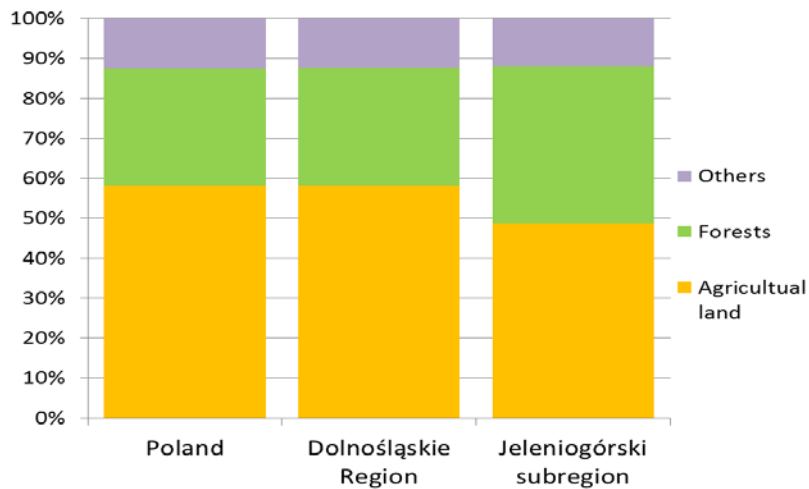


Fig. 3. Land use in Poland, Dolnośląskie Region, Jeleniogórski subregion, 2005

Source: the Central Statistical Office of Poland (www.stat.gov.pl)

But the Jeleniogórski subregion is much diversified internally in regard to the general land use. There is a group of five counties located in the central belt of that subregion (going from the west: lubański, lwówecki, złotoryjski, jaworski and kamiennogórski) where the share of the arable land is above average. Contrarily, in counties – jeleniogórski (high share of mountains), zgorzelecki and bolesławiecki (big complex of Dolnośląskie Forests) over 50% of the land is covered by forests. In Jelenia Góra town, over 25% of the land is used by other types (mostly built-up and industrial areas). The highest than average share of “others” category in zgorzelecki and bolesławiecki counties is connected with brown coal mining and occurrence of military areas (see more about that later in the report).

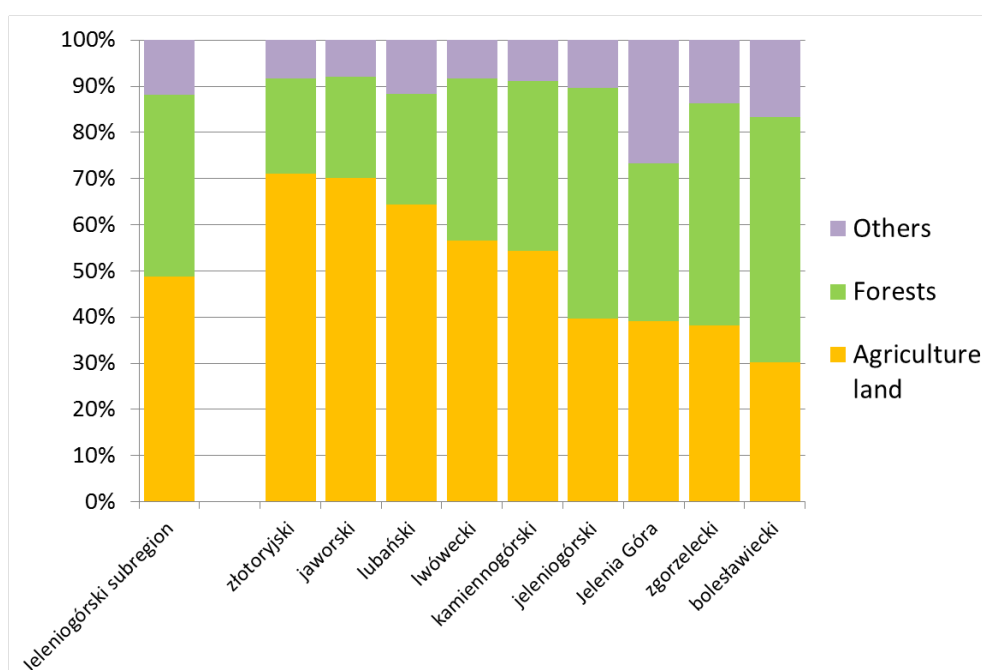


Fig. 4. Land use in the Jeleniogórski subregion and its counties in 2005

Source: the Central Statistical Office of Poland (www.stat.gov.pl)

The more detailed way of the contemporary diversification of the land use, based on the data from the Corine Land Cover, can be found on the map below (fig. 5). It is a clearly visible complex of forests and meadows in the mountainous part of the subregion and large complex of forests in the north. Between these areas, there is a domination of agricultural areas. As presented on the map, the settlement system in that subregion is a polycentric one – there is no a big centre with a dominant position (Jelenia Góra – 84,000 inhabitants), but there are also other towns that play an important role in the settlement system (Zgorzelec – 32,000; Jawor – 24,000; Lubań – 22,000; Kamienna Góra – 21,000; Złotoryja – 16,000). The settlement system is supplemented by many smaller towns and villages – most of them has a very linear character (houses are built along the main roads, which means that

they are not a complex settlements). It has to be mentioned that there are two important large complexes of artificial land, which are not settlements.

First one is located in zgorzelecki county (the most south-western part of the subregion) – it is the brown coal mine Turów, which is part of the brown coal mining complex on the Polish-German-Czech border. It is one of the biggest open coal mines in Poland. Next to the mine power plant is located, which produces around 8% of total Polish production of electricity. The power plant (1900 MW) has been in operation since the 1960's and in 2005 it underwent a complex. The mine, power plant and surrounding infrastructure exert a big impact, bringing about the changes in the land use. The second important artificial land is located in the bolesławiecki county – there, the largest military training area in Poland is found.

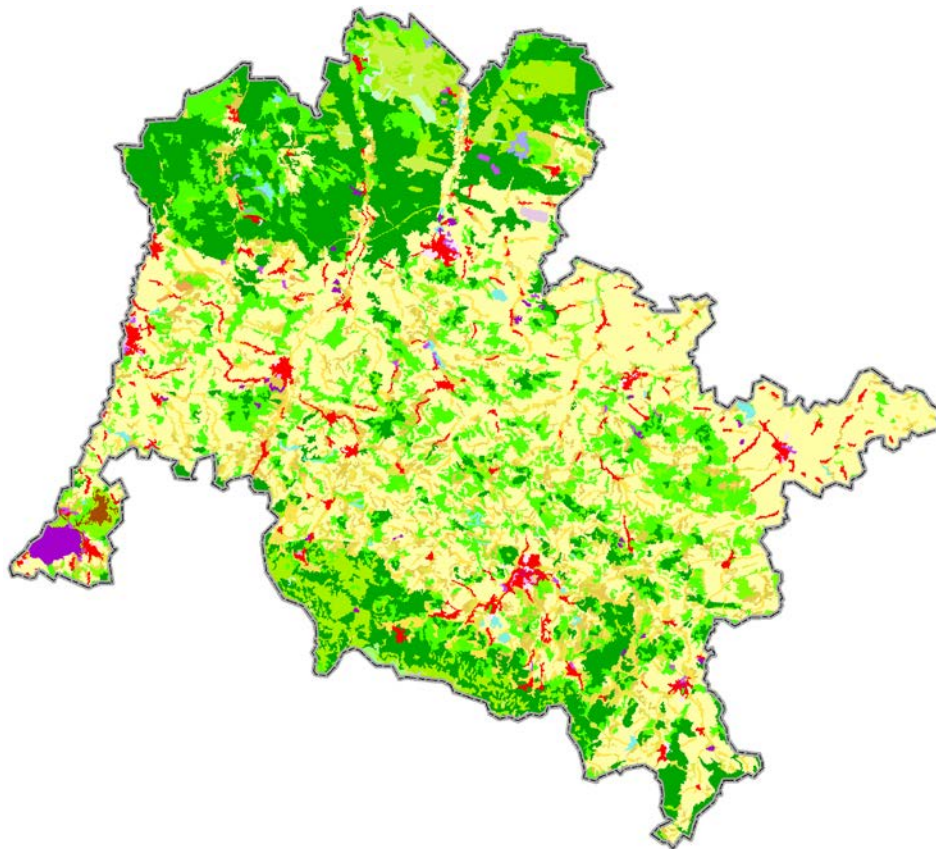


Fig. 5. Land cover of the Jeleniogórski subregion in 2006

Source: own work based on the Corine land Cover data



Photo 3. Brown coal mine in Turów (zgorzelecki county).

Source: photo by Krzysztof Janc.

Extremely important elements in the structure of the land use are the changes that have taken place in the recent years. In the Jeleniogórski subregion these changes have not been very dynamic – the share of agricultural land has remained rather at the stable level, the share of forests has been on the increase from 37% to 39%, and the category “other” - on the decrease, mainly in such subcategory as: the abandoned, not utilised land. After the accession to the European Union and implementation of agricultural payment connected with the Common Agricultural Policy, a considerable share of formerly abandoned agricultural land started to be utilized again (in the whole of Poland the share of abandoned land decreased by 60% between 2002 and 2006).

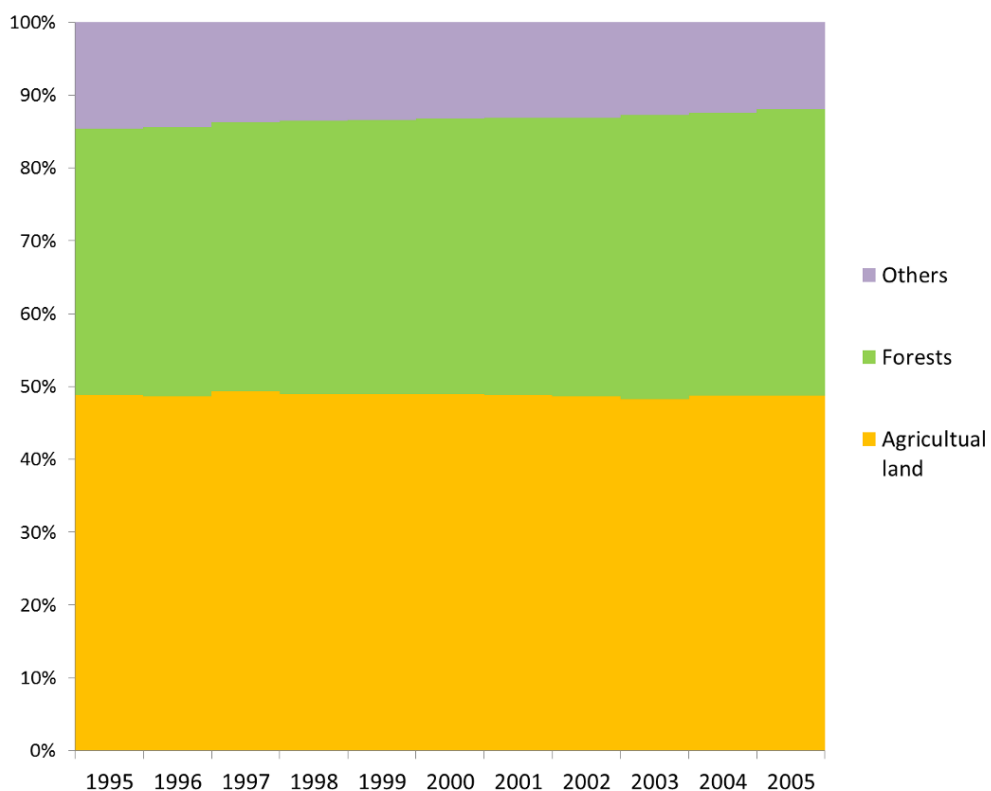


Fig. 6. Changes in the land use in Jeleniogórski subregion in 1995-2005

Source: the Central Statistical Office of Poland (www.stat.gov.pl)

In the Jeleniogórski subregion the share of pastures and meadows is higher in comparison to a national and regional average – it is the result of the land-relief and also of the climate and soils conditions (more about that in the next chapters).

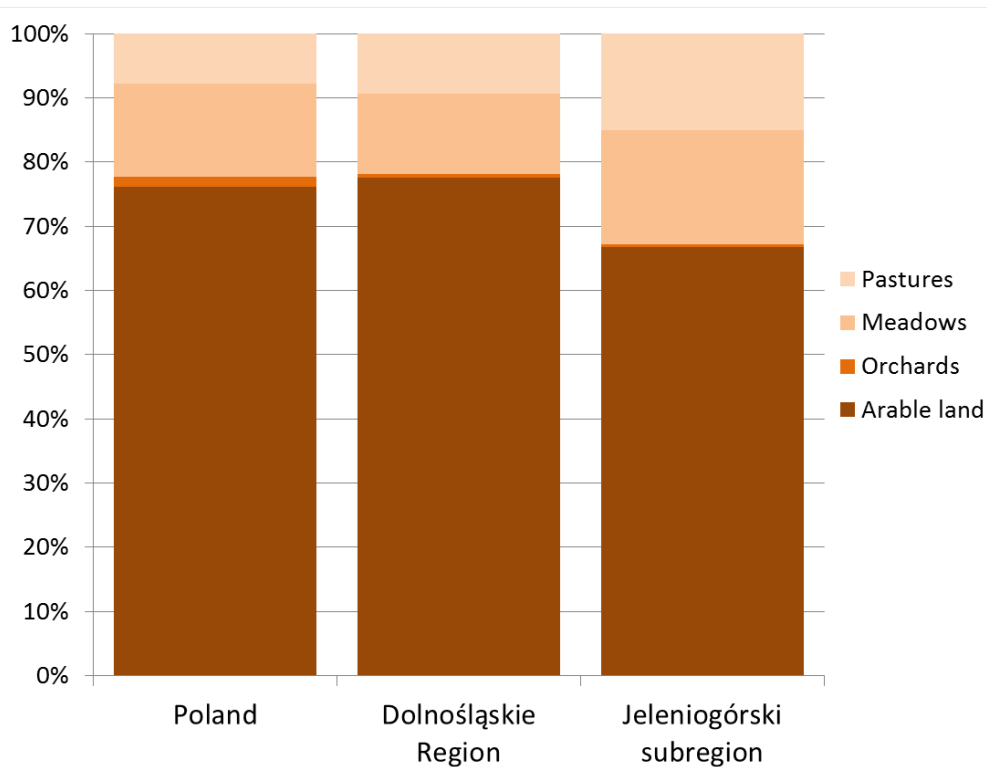


Fig. 7. Utilization of the agricultural land in Poland, the Dolnośląskie Region and the Jeleniogórski subregion as of 2005

Source: the Central Statistical Office of Poland (www.stat.gov.pl)



Photo 4. Grasslands in the vicinity of the Karkonosze (on the photo the highest peak of Sudety Mountains – Mt. Śnieżka).

Source: author's materials.

2.3. Land cover characteristics

Where the land cover in the Jeleniogórski subregion is concerned, two specific elements should be pointed out. As was mentioned above, there is the higher than average share of grasslands (pastures and meadows) as well

as fallow and waste lands in the total area of arable lands. This situation is due to many factors among which are: relief and hypsometry – areas of inconvenient relief (all mountainous and upland areas in Poland has similar characteristics), poor quality of soils and other elements of agricultural space (eg. short growing season in the mountainous areas), out-migration from that areas, resulting from the fact that fewer and fewer inhabitants want to deal with agriculture (more about demographics in chapter 3) and also changes of agricultural land into the built-up areas due to the higher prices. It has to be stressed that even that the arable lands has the highest share in total agricultural lands, but in generally in that subregion the share of grasslands is higher than average and as well relatively high share of arable land is not utilized.

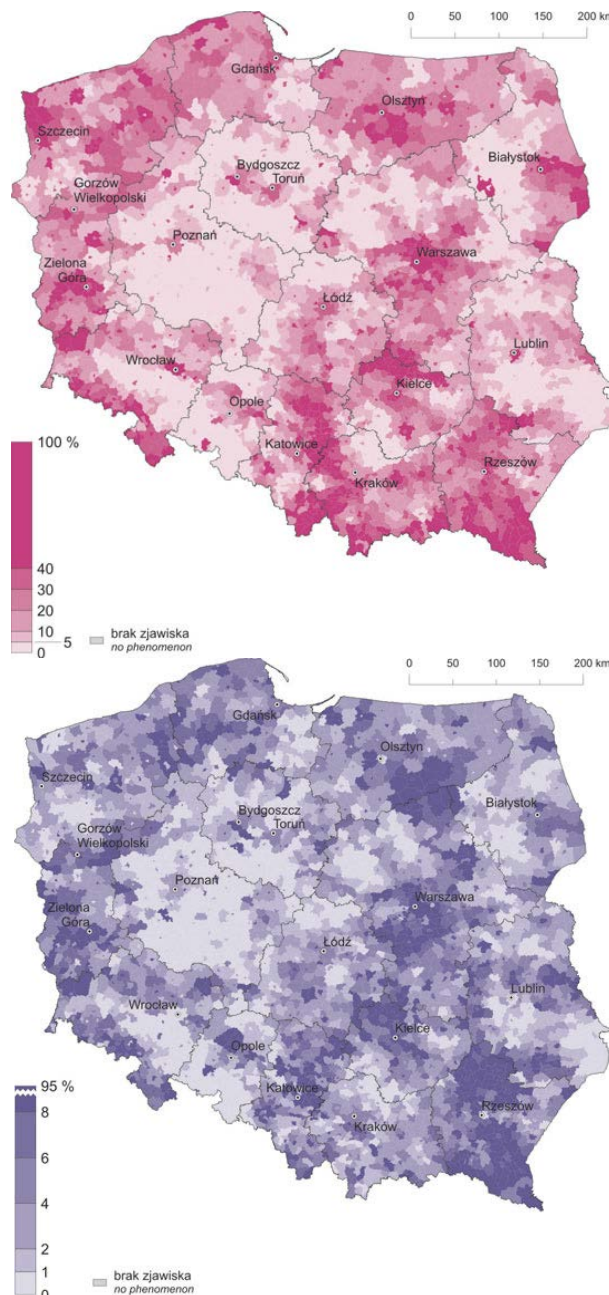


Fig. 8. Share of fallow lands and waste lands in total area of arable lands, 2002

Source: *Atlas of Polish Agriculture* (2010).

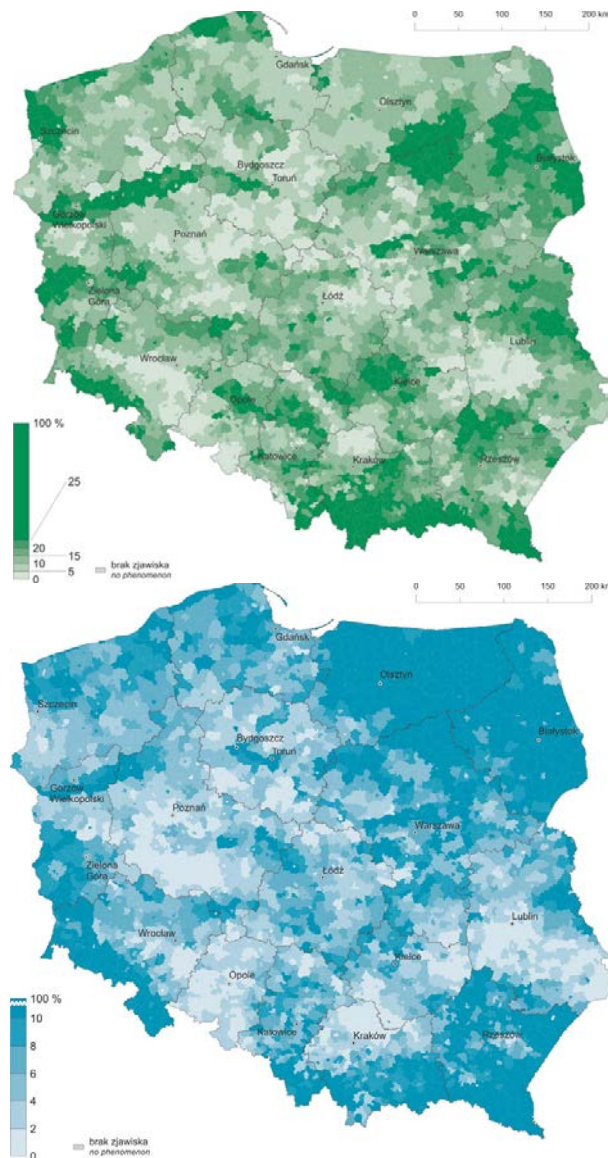


Fig. 9. Share of meadows and pastures in total area of agricultural land, 2005

Source: *Atlas of Polish Agriculture* (2010).

Other important element of that region, which greatly influences the land cover, is its diversified geological structure. The Sudety Mountains are very old from the geological point of view and hugely diversified. It results from a big diversity of the soils conditions. As visible on the maps below, generally, in that subregion, we can observe such tendency – the less diversified relief, the better quality of soils (fig. 10). But that general relationship is varied, depending on locally occurring specific conditions. That is why we can observe and notice a very mosaic character of the soils conditions, which is strictly connected with the land cover.

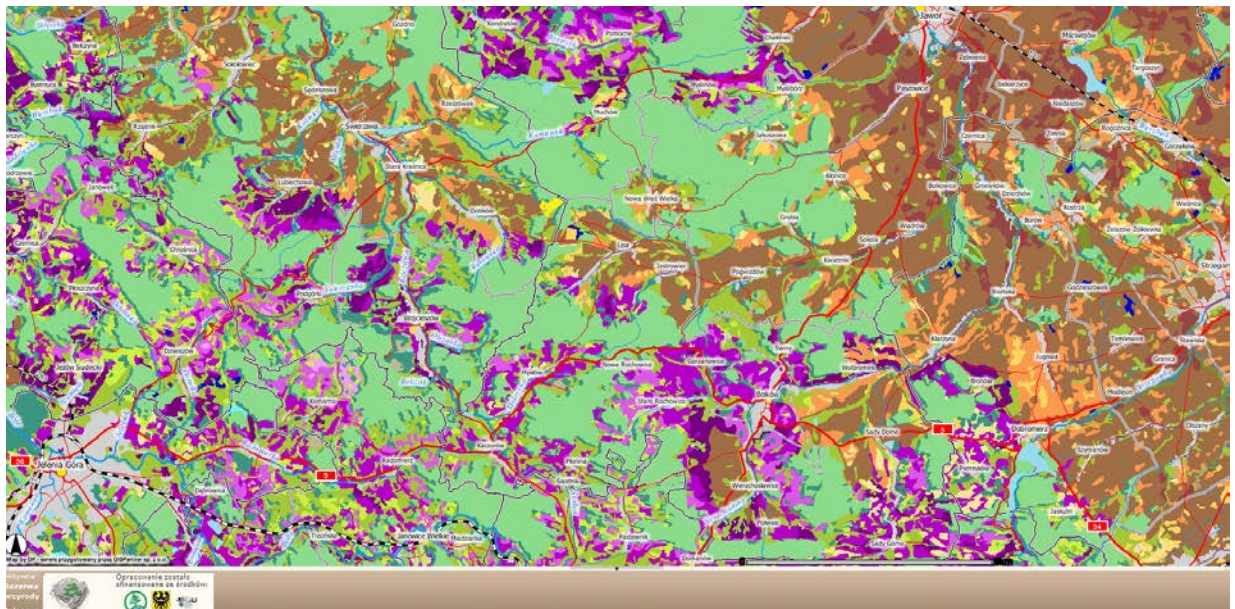
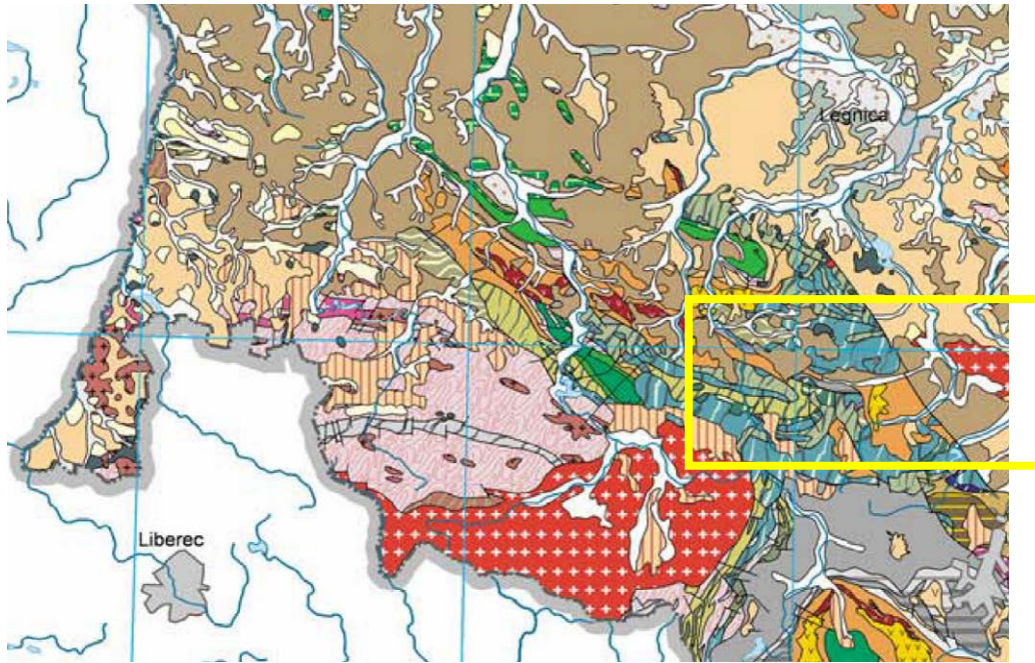


Fig. 10. Diversified geological situation in the Jeleniogórski subregion (above) and a proof of a hugely mosaic nature of the existing soils conditions on the example of the area between Jelenia Góra and Jawor (below)

green: forests, violet: very poor quality of soils, orange and brown: average and good quality of soils
 Source: <http://eko.wbu.wroc.pl>

2.4. Technical management of the land use

This area before the II WW was characterized by a very good organization in terms of spatial planning and technical infrastructure. However, the war brought about significant changes in the situation there due to following factors: (1) a location close to the border (not so many investments were made in such zones in the socialist era), (2) a migration to these places of inhabitants from the ex-Polish territories (now Ukrainian territories), who were

unfamiliar with the use of the technical equipment that left after the war, (3) a lack of investment in development because of the fear that these territories may return to the previous owners and also (4) the state policy, which gave high priority to the development of state agriculture and industrial towns. That is why during the last decades the level of development of infrastructure has slowly decreased. A considerable depreciation of existing buildings and infrastructure has been noted. For example, as can be seen on the map below, in the analysed subregion more than 35% of houses were built before the I WW (fig. 11). Thus the aforementioned high level of depreciation is due to three basic elements: year of construction of the houses, type of used elements (eg. woods) and lack of modernization of the older settlements (Ciok, 1991, 1994). Many villages, because of the permanent out-migration from these areas, have virtually disappeared.

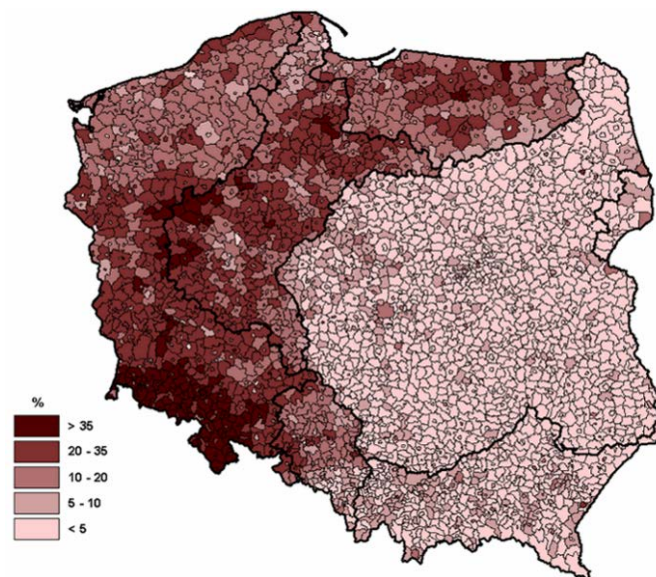


Fig. 11. Share of houses built before 1918 (historical borders of partitions in XIX century)

Source: own work based on data from the Central Statistical Office of Poland (www.stat.gov.pl)



Photo 5. Example of renovated and desolated old houses (zgorzelecki county).

Source: photo by Krzysztof Janc and author's materials.

Generally, as can be noticed on the graph and maps below, the situation in terms of development of technical infrastructure is comparable to a national average (fig. 12, 13). But taking into account that in Poland, generally, the level of development of infrastructure (technical, transport and others) is higher in its western part, the situation in the Jeleniogórski subregion should be analysed within the borders of the whole of the Dolnośląskie Region. In such analysis, it has to be stressed that there is a significantly lower level of development for all selected elements of technical infrastructure.

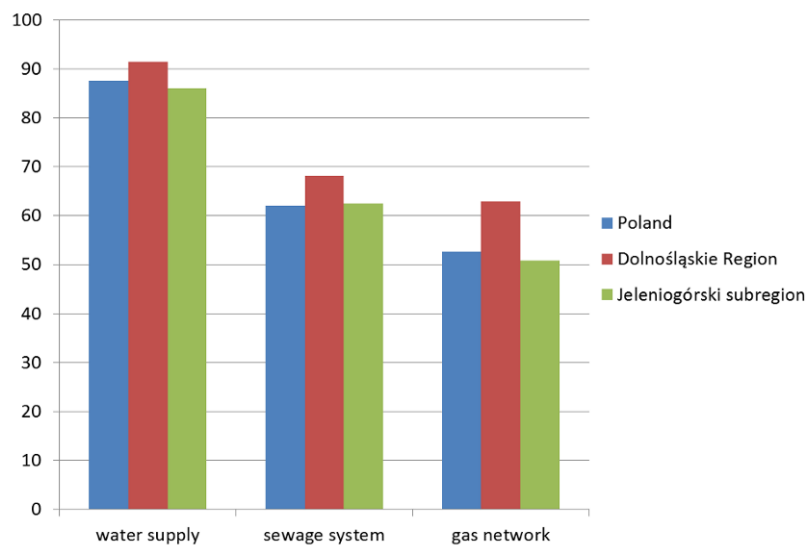


Fig. 12. Percentage of population with the connection to water supply, sewage system and gas network in Poland, the Dolnośląskie Region and the Jeleniogórski subregion, 2010

Source: own work based on data from the Central Statistical Office of Poland (www.stat.gov.pl)

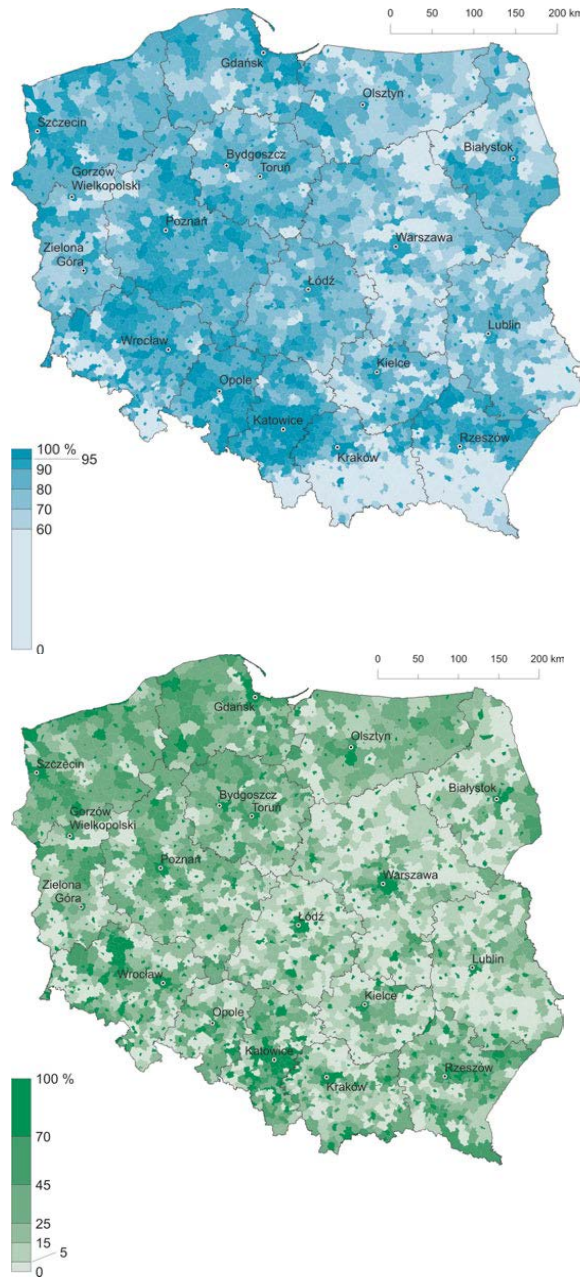


Fig. 13. Percentage of population with the connection to water supply and sewage system, 2007

Source: *Atlas of Polish Agriculture* (2010).

2.5. Major trends in historical context

In the Dolnośląskie Region, it is very characteristic that most of the towns were created only in two historical periods: i.e., in the 13th or 20th century. The first period dates back to the medieval times, when the initiators were mainly some dukes or bishops. These towns have a typical settlement structure – there is a market surrounded by the houses, a church and some

civil facilities like town halls and sometimes castles. Especially during the 19th century these towns started to grow due to the industrialization processes. Other type of towns was created in the 20th century – their existence was mainly connected with the development of industry (new factories – “green field” investments – eg. Bogatynia, Pieńsk) and tourism (old villages such as Karpacz or Szklarska Poręba growth very quickly). There are marked differences between these two kinds of towns: the medieval one has a well-planned structure of the core and then differentiated peripheral parts, while on the other hand the newly created towns are characterized by much more chaotic development. These differences are very important in the present-day analysis of the land use and land functions.



Fig. 14. The century in which the charters with towns rights and privileges were given to localities located in the Jeleniogórski subregion and a plan of the typical medieval settlement of Lwówek Śląski
 Source: Miszevska (2009).

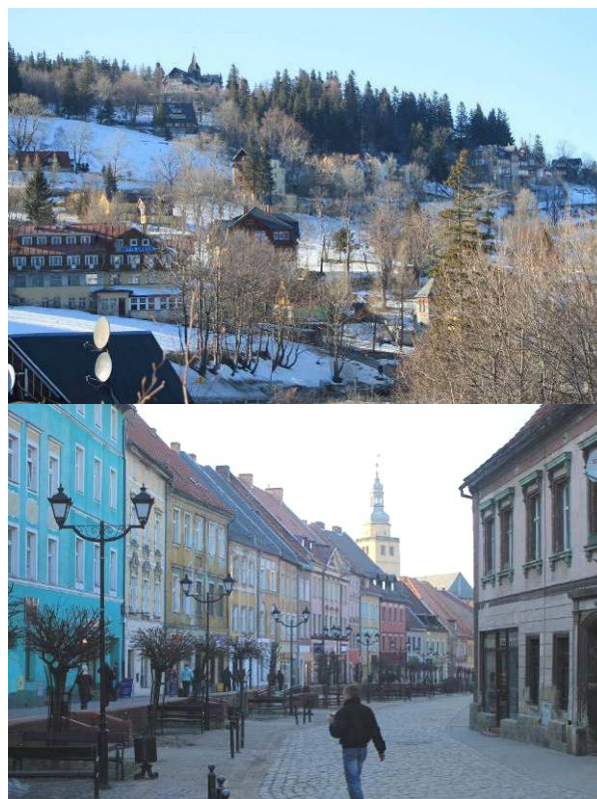


Photo 6. Chaotic character of the Karpacz town built-up area (town's rights charter given in 1960) and a more complex settlement pattern of Kowary (town's rights charter given in 1513) – a distance between those towns is 6 kilometres.

Source: author's materials.

Before the II WW that region was a peripheral part of the Germany. It fell behind the rest of the country in economic development, however, in addition to some investments made in the industry there (mainly based on fossil deposits), also the development of tourism (mainly in the Sudety Mountains) and transport infrastructure was promoted (relatively high density of railway network).

After the II WW that area was inhabited mostly by the people from the ex-Polish territories (mainly present-day Ukraine). New inhabitants were far behind in terms of education, had no experience of working in the industry, as well as being pioneers taking the first steps in learning the art of agriculture in the mountains and uplands. That is why at the beginning the efficiency of the land use was much lower than before. Similarly as in the case of all ex-German territories in the western Poland, the land was collectivised and the state-owned farms were created, but still in the Jeleniogórski subregion the share of private owners exceeded 50%. During the whole socialist period the industry constituted the important sector of economy. But the state government did not invest a lot in that region. Taking advantage of the industry that was developed here by Germans before the II WW, the government utilised these factories, without undertaking any necessary renovations, and instead investing money in projects developed mostly in other parts of Poland (Ciok, 1991). However, there was one huge investment into development of the brown coal mine and accompanying that mine the power plant near Bogatynia in zgorzelecki county (as was mentioned in the previous chapters). For that reason at the end of the socialist era, the level of depreciation of existing factories was the highest as compared to the whole Poland. Because of that processes: namely, depreciation of infrastructure, houses and industry, depopulation processes, high level of pollution, difficult or unfavourable conditions for agriculture, that area was started to be called the "problem area" (Potocki, 2009).

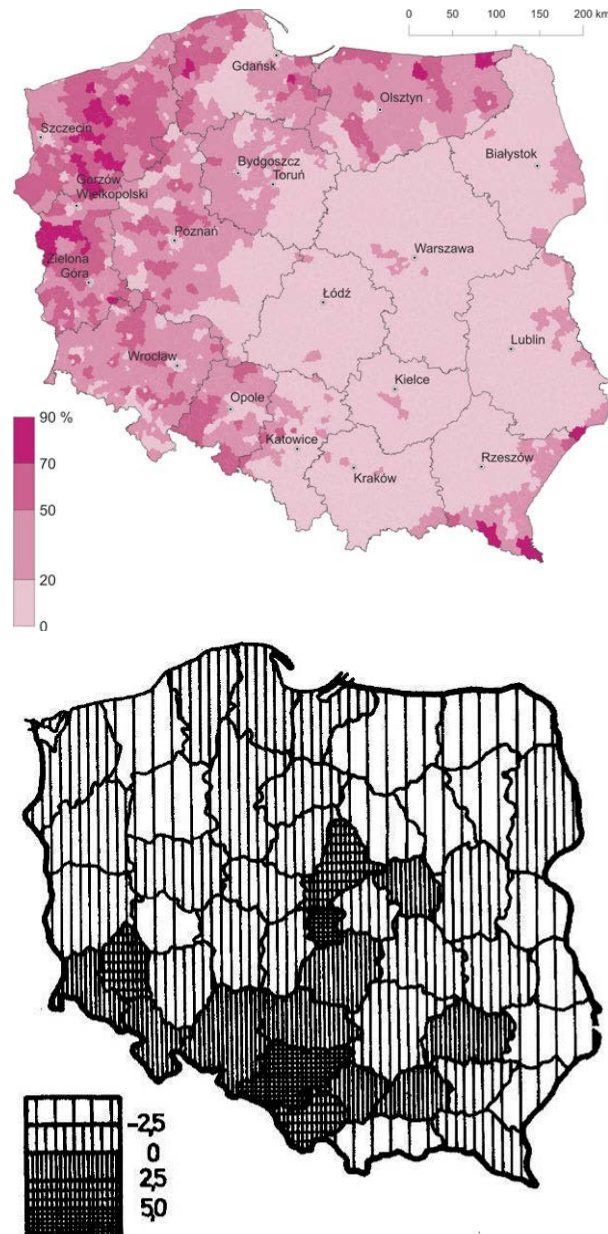


Fig. 15. The share of agricultural land managed by the state and co-operative sector farms in 1989 and level of development of industry sector in 1984

Source: *Atlas of Polish Agriculture* (2010) and Ciok (1991).

After the 1990 many of the factories collapsed, because they were depreciated and not sufficiently competitive on the open market. This resulted in the high level of unemployment and the increased out-migration. In the recent years the development of tourism and settlement can be observed (in the suburbs and these parts of the region that are characterised by beautiful landscape) – more about contemporary processes in the next chapters.



Photo 7. Power plant in Turów (near Bogatynia, zgorzelecki county) directly connected with the brown coal mine.

Source: photo by Krzysztof Janc.



Photo 8. Development of the new built-up areas near Jelenia Góra on the post-agricultural areas.

Source: author's materials.

3. DESCRIPTION OF CHANGE IN RELATION TO LAND USE

3.1. Socio-economic

As was already mentioned several times, the Jeleniogórski subregion is classified as depopulating region. According to ESPON typology it is one of a few subregions in Poland which are marked by both negative natural and migration balance.

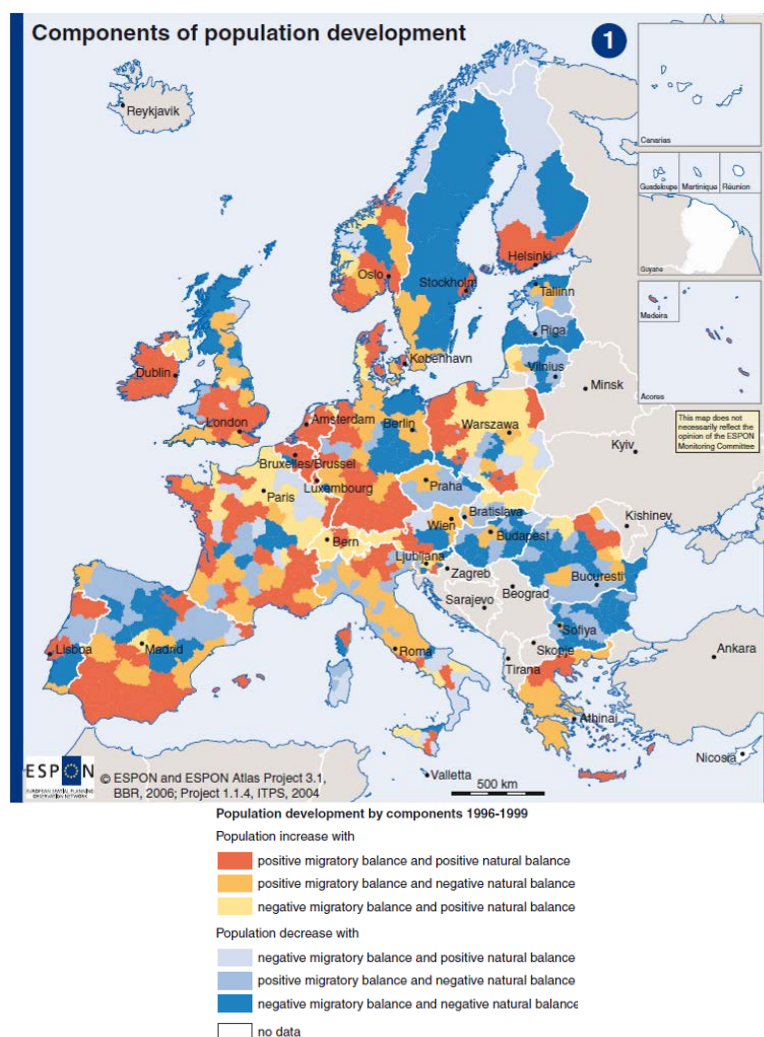


Fig. 16. Population development by components of migratory and natural balance, 1996-1999

Source: *ESPON Atlas* (2006).

In the recent 15 years, the overall population of Poland has decreased by 1%, however in the Dolnośląskie Region by 4% and in the Jeleniogórski subregion by 7%. Each year on average the negative net migration is about minus thousand inhabitants (approximately -2‰). When compared to other parts of Poland, we can point out areas with more intense dynamics in population change (for example in eastern Poland), but still the present-day model of migration processes, which attests to the concentration of inhabitants in big

regional centres and their surrounding zones, adversely affects the analysed area. As can be seen on the maps, this process has been in operation for a long time in that subregion (fig. 18). Since 1960, that region has lost about 25% of its population, this being justification why some scientific and strategic documents call it the “problem area”.

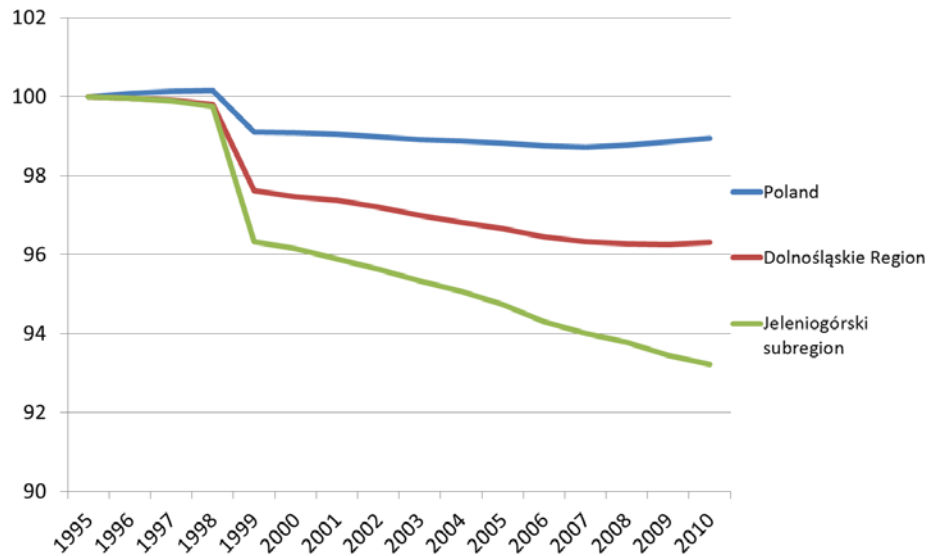


Fig. 16. Changes of population in Poland, the Dolnośląskie Region and the Jeleniogórski subregion in the years 1995-2010 (1995=100)

Source: own work based on data from Central Statistical Office of Poland (www.stat.gov.pl)

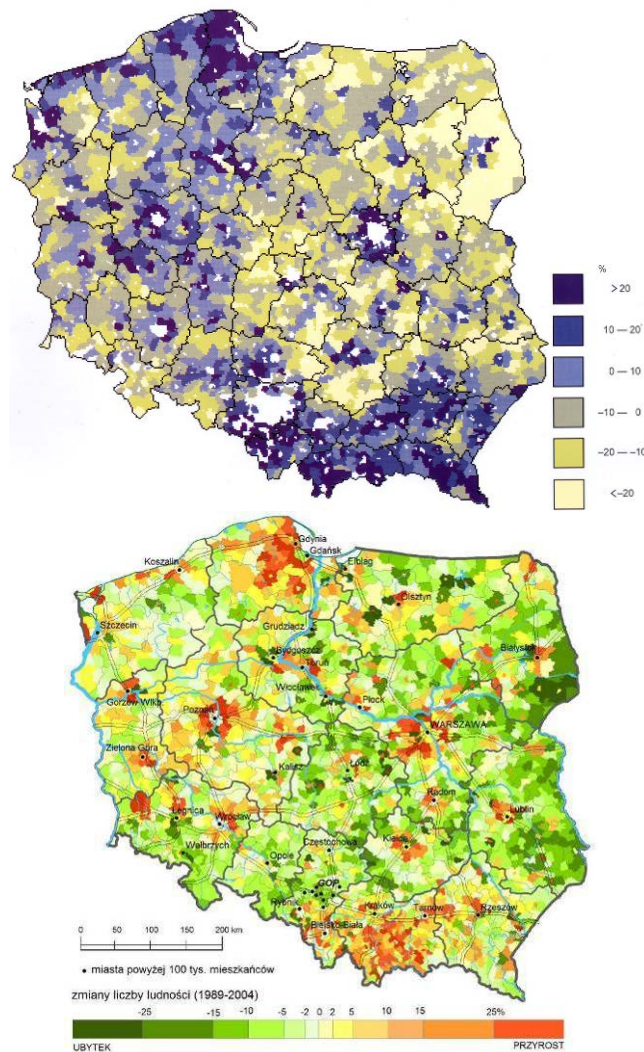


Fig. 17. Changes of population in Poland by communes in the years 1961-1988 and 1989-2004

Source: Frenkel, Rosner (1995) and Węclawowicz *et al.* (2006).

The above-mentioned processes that take place within the framework of demographic developments are heavily influencing not only the general (total) number of population, but also its composition. In 1995 the share of inhabitants in pre-productive age (less than 18 years old) was in the order of 27%, in 2010 this index decreased to 18%. Within the 15-year span, the total number of inhabitants in the productive and post-productive age increased by 24,000 people, while at the same time the number of inhabitants in the pre-productive age decreased by 67,000 people! In 2010 the total population of that group was at the level of 60% as compared to the one that was registered in 1995. This is the most important demographic problem of that region – it significantly affects both the way of and strategies of the infrastructure development, labour market, transport connections, etc. The reasons for such situation are twofold – general trends and specific characteristics of this area. Generally, in Poland, there is a decrease in number of newly born children due to noticeable widespread changes in the life style. Also it can be noticed that, due to the rapid growth of agglomeration areas which offer better possibilities of employment, the peripherally located area are witnessing steady decline in population. Factor of much significance that started to gain

in importance in Poland about 20 years ago, is the education, facilitating fast development of universities and private higher institutions most of all in major regional centres. Many of the late teenagers and young persons, who migrate to those regional centres for education, decide to stay there after finishing their studies. One factor of key significance that contribute to a decrease of population in the Jeleniogórski subregion is poor opportunities for employment there. As a consequence of collapse of many industrial companies, a high level of unemployment is endemic (Pisz, 2008).

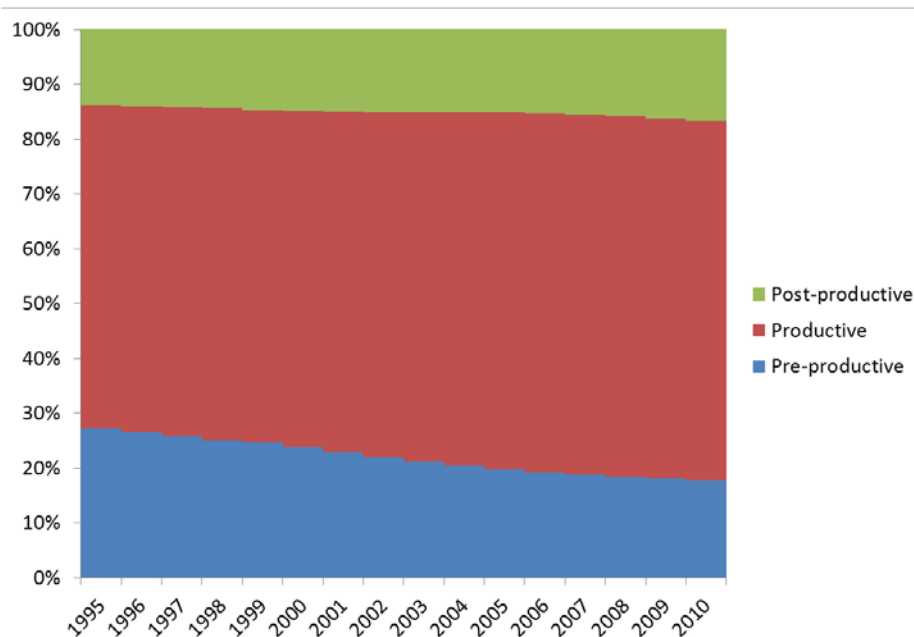


Fig. 18. Changes of the age structure in the Jeleniogórski subregion, 1995-2010

Source: own work based on data from the Central Statistical Office of Poland (www.stat.gov.pl)

The Jeleniogórski subregion is characterised by a dominant role played by industry and services in employment. The gross added value of agriculture and also the share of employment in the primary sector is on a very low level. Generally the gross domestic product *per capita* in the Jeleniogórski subregion in 2008 was at the level of 26,300 PLN, which constituted 78% of the national average and only 73% of the regional average. These figures shows that the Jeleniogórski subregion is characterised by a relatively better demographic and economic situation than many subregions in eastern part of Poland, however its situation is much worse as compared to the regional and also national average.

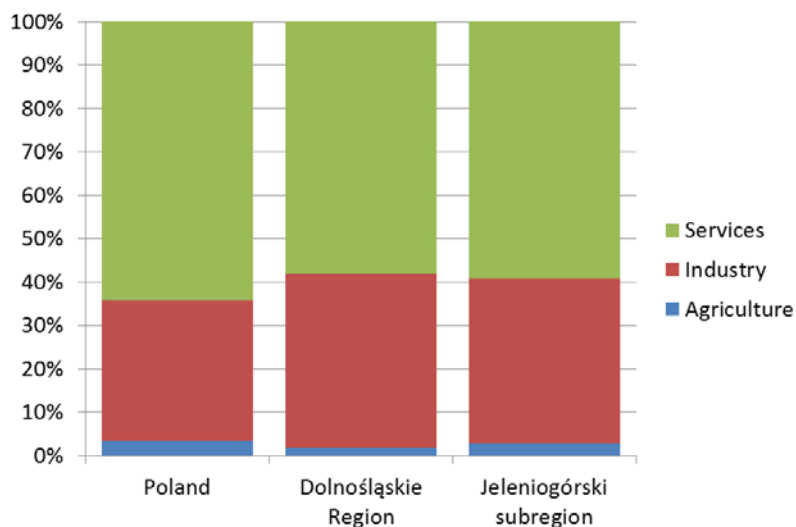


Fig. 19. Gross added value by sectors in Poland, Dolnośląskie Region and Jeleniogórski subregion in 2009

Source: own work based on data from the Central Statistical Office of Poland (www.stat.gov.pl)

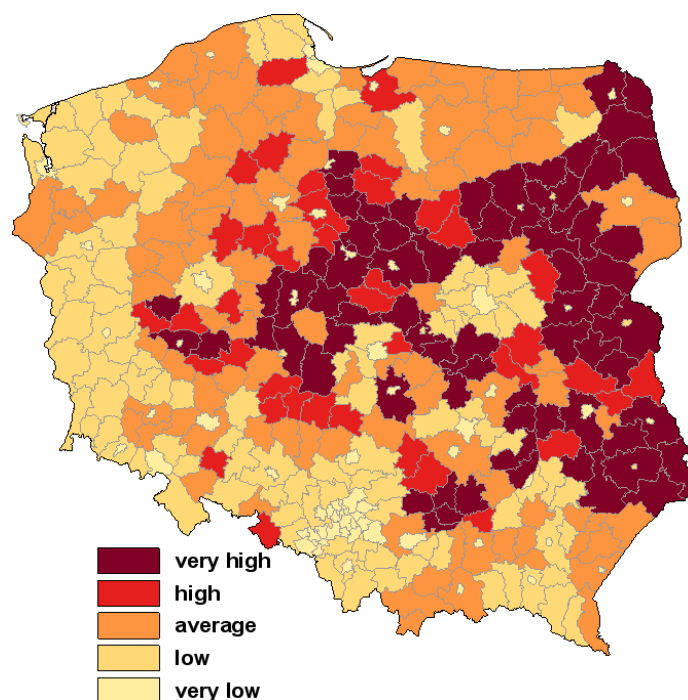


Fig. 20. Share of households depending upon income from agriculture, 2003

Source: own work based on data from the Central Statistical Office of Poland (www.stat.gov.pl)

3.2. Environment

Generally the climate in the Jeleniogórski subregion is much wetter and colder than in the other parts of Poland and especially than in other parts of the Dolnośląskie Region. On the whole this area of Poland, i.e., the Dolnośląskie Region is much warmer, with the growing season longer than in the rest of the territory of Poland, but owing to the influence of the Sudety Mountains, the situation in the Jeleniogórski subregion is a little bit different. The precipitation totals in the Jeleniogórski subregion are about 50% higher than average in

Poland. Consequently, the growing season in this area oscillates around 190-200 days, while in the neighbouring subregion of Wrocław exceeds 220 days.

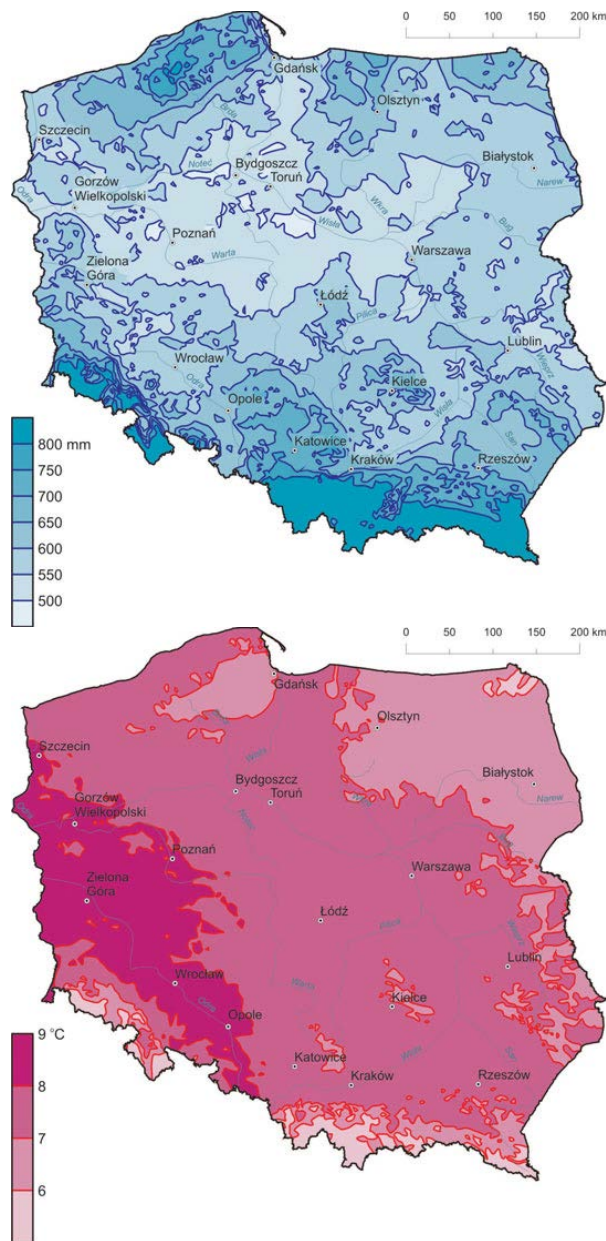


Fig. 21. Average precipitation and temperatures in Poland.
Source: *Atlas of Polish Agriculture* (2010).

In general the relief features of the Jeleniogórski subregion are much diversified. The differences between the highest and the lowest point of that subregion reach around 1500 meters. Such relief influence all kinds of human activity – roads construction, housing, infrastructure, agriculture, etc. – as well as influencing the land use too.

The soils are of poor quality, as was already mentioned a little in the previous chapter. But when we take a closer look at the map, we find that the quality of soils for agricultural production is especially poor in the mountainous part of the subregion and not sufficiently good in quality in the northern part (fig. 22).

Only small portion of this subregion that is located in the east (primarily złotoryjski and jaworski counties) enjoys favourable conditions.

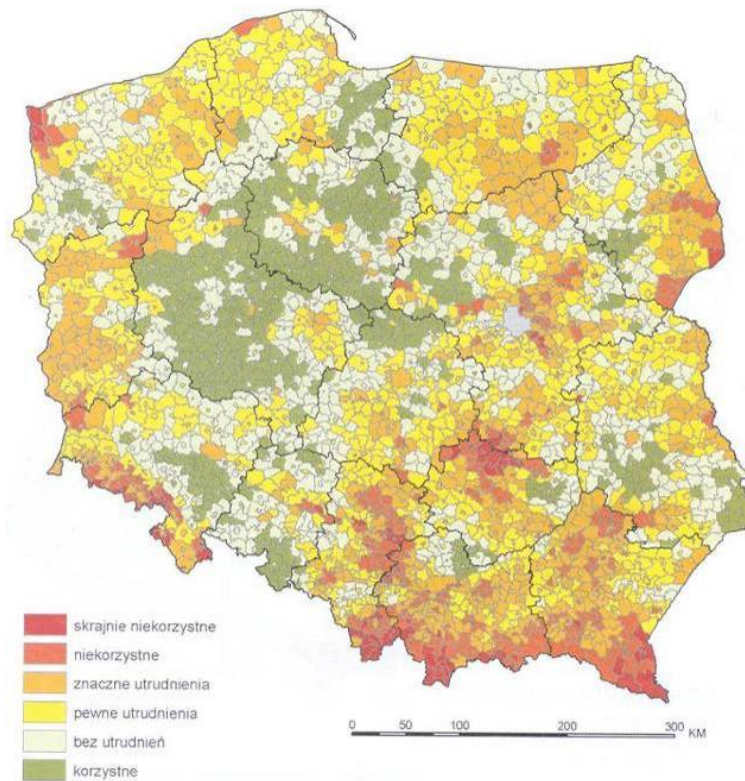


Fig. 22. Natural conditions for agricultural production in Poland.
 green – favourable, then from yellow to scarlet the conditions are getting increasingly worse
 Source: Bielecka, Ciołkosz (2003).

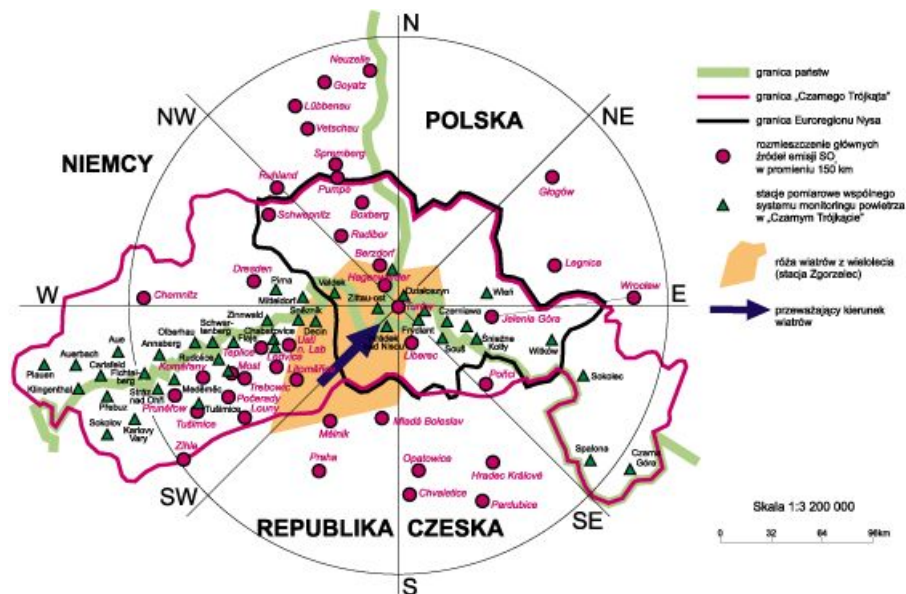


Fig. 23. German-Czech-Polish Borderland.
 Green line – national borders, Red line – border of “Black Triangle”, red points – main emitters of pollutions, arrow – prevailing direction of winds.
 Source: www.geoland.pl/.

In the last decades (especially in the 1970's, 1980's) the said subregion experienced severe problems with environmental pollution. In the borderland of Germany, the Czech Republic and Poland, considerable emitters of air pollution were located – mainly SO, CO₂, NO. Owing to the fact that almost 60% of winds in the region blows from the west or south-west, pollutants were mostly transported into this subregion, precipitating as the so-called “acid rains”. Because of much damage done to the environment by these pollutant emitters, this borderland region started to be called “Black Triangle”. In the last two decades the situation has changed enormously, due to such factors as follows: a more restrictive environmental policy, restructuring of the existing factories, the collapse of many of the industrial activities and also because of increased length of the sewage network. Thus nowadays the situation in the region is much improved and thanks to tremendous efforts on the part of many institutions, the quality of environment is getting better and better.

In the analysed subregion, on the one hand, there are not so many environmentally protected areas, however, on the other hand, the oldest and well-known the Karkonoski National Park is to be found here. It was established over 50 years ago with a view to protect the unique landscape of the highest mountain range in that part of Poland and the Czech Republic – the Karkonosze.

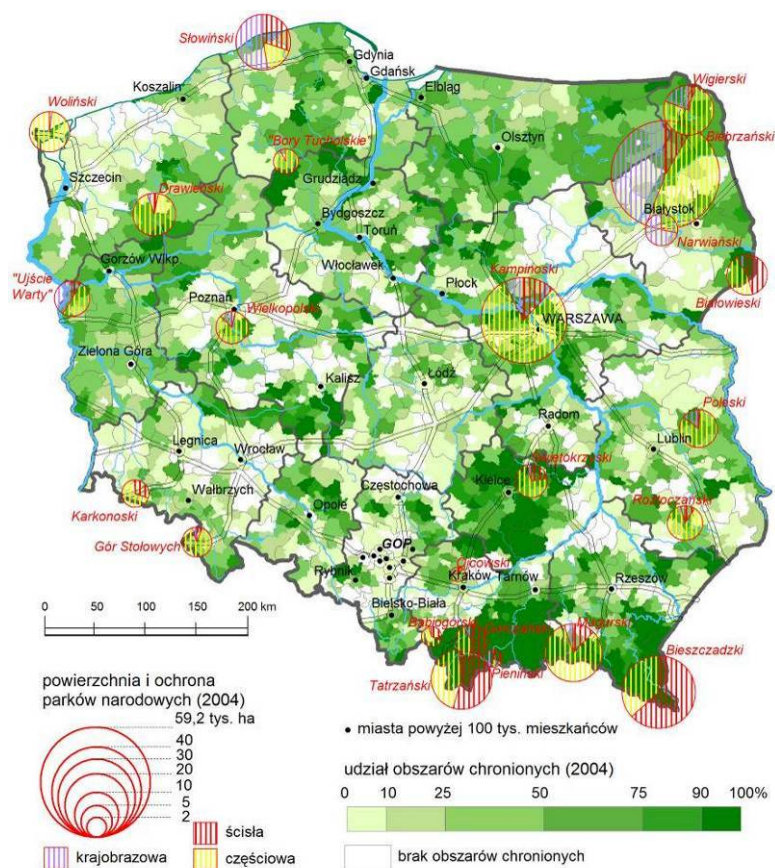


Fig. 24. Share of protected natural areas in the total area of the communes in 2004 and size of the national parks

Source: Węclawowicz *et al.* (2006).

3.3. Government and policy

As was briefly described in the introduction, in Poland there are three levels of government, in addition to the national government. Each of that level has its own specific competences and responsibilities, by means of which local authorities can influence directly or indirectly the changes in land cover and land use functions. In particular, it is the communes' authorities that enjoy considerable powers (gmina – LAU2 level). In the Jeleniogórski subregion there are 51 communes – they are much differentiated in terms of size, population (from 1,600 inhabitants in rural commune Platerówka to 84,000 inhabitants in Jelenia Góra town), budget, etc. But the range of responsibilities that rest with each communal authorities is similar – among other things, following can be mentioned: the water management, communal roads, water supply systems, the sewage system, public transport, the sports facilities and tourism including recreational grounds and, what is very important in this analysis - the spatial harmony and real estate management. The commune's authorities are equipped with legal tools to accept and monitor the spatial management and planning. There are three basic documents on the commune level – the study of conditions and directions of spatial planning (general document on the commune level), the local plan (highly detailed document) and, lastly, the local self-government decision concerning spatial planning on the areas where there are no local plans. Such situation, whereby the decision about development of land in this way or another lies in the responsibility of the authorities of the commune, does not contribute to proper spatial planning. In the analysed area of the Jeleniogórski subregion, we can observe that a significant share of the land is covered by the very detailed local plans. Unfortunately, in the areas, where there exists the greatest pressure on the land on the part of developers, namely in a touristic zone of the Karkonosze Mountains, the share of the local plans is the lowest. As a result, in some parts of this area a very rapid and “uncontrolled” development of the recreational and touristic buildings can be observed. The most well-known case was a construction of the huge hotel in Karpacz town – in order to build that hotel special changes in the local plans of that town were made (for more details see Appendix 1).

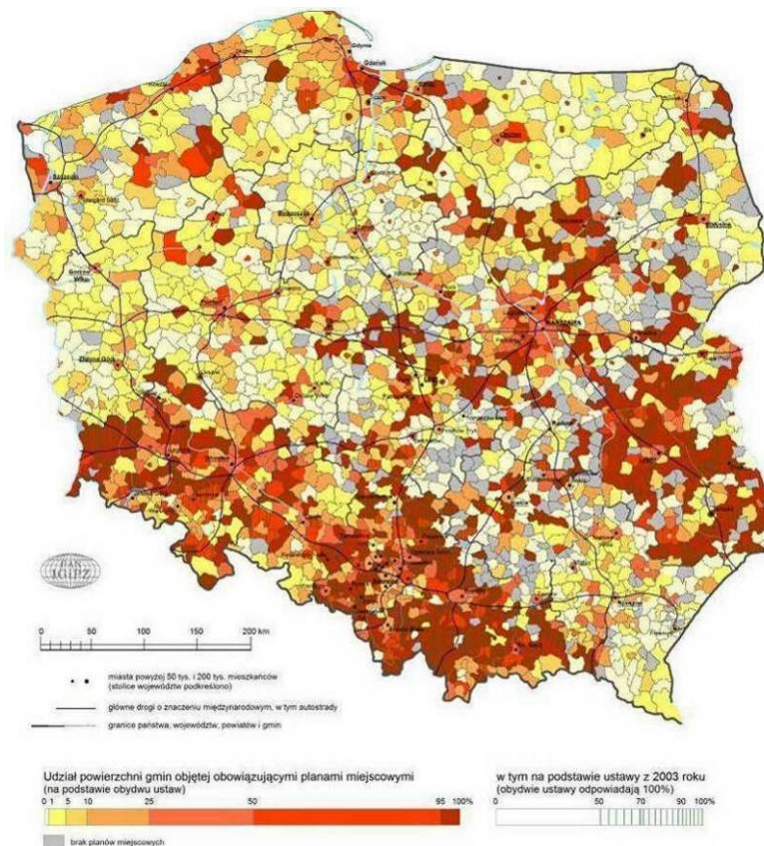


Fig. 25. Share of commune territory covered by the local plans in 2010

Source: Śleszyński (2011).

The role of the counties (LAU1 level) in the process of changes in land cover and land use functions is rather limited to indirect elements. They can just provide the favourable conditions for development of some regions in these or other directions. It is important to have closer look at the directions in which each of the county attempts to develop its territory, but because of the limited amount of own budget incomes and small responsibilities and powers in relation to communes and regional responsibilities, it is enormously problematic for the counties to accomplish all of their ideas and goals. Below the main concepts of development for almost all of the counties in the Jeleniogórski subregion are presented:

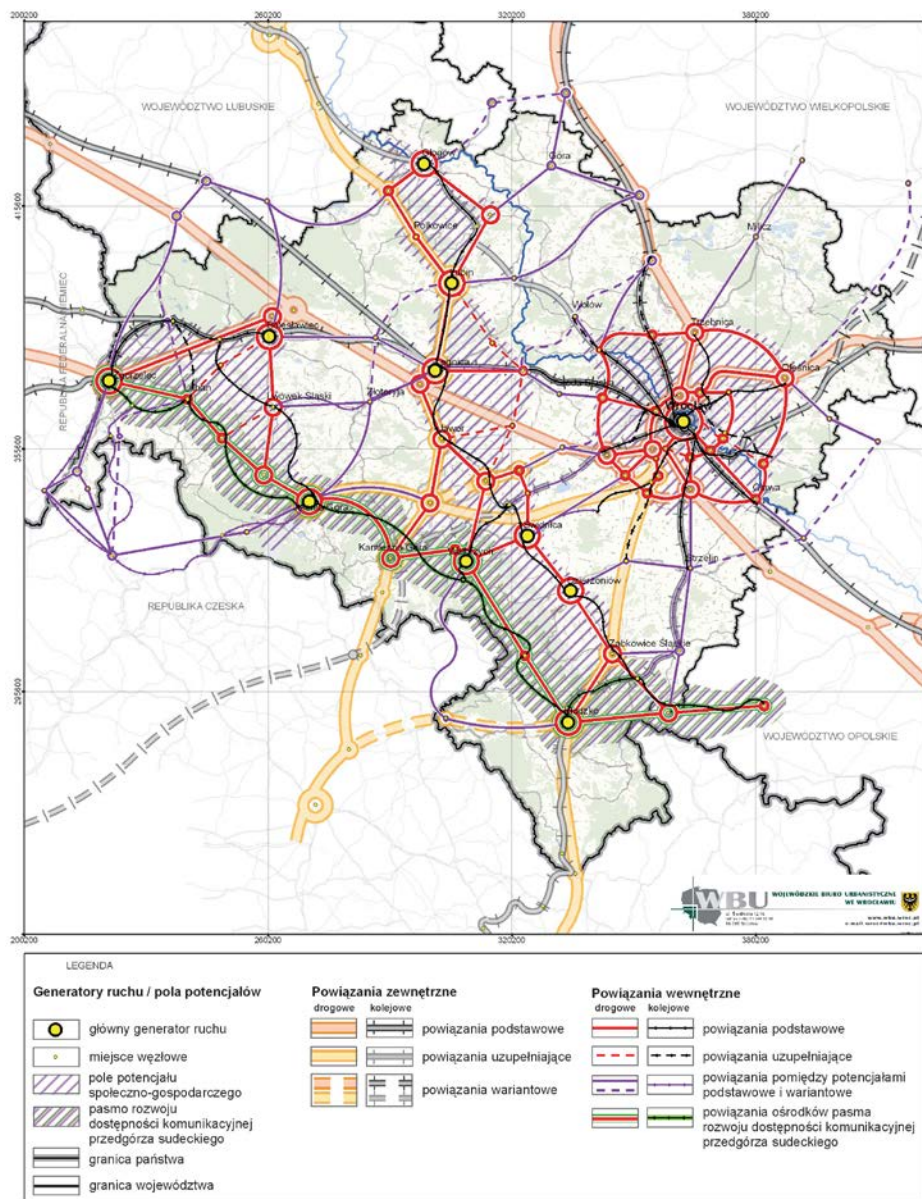
- Zgorzelecki County – clean environment, development of individual housing, development of tourism functions, multifunctional development of economy, improvement of social infrastructure (medical, educational and recreational), providing greater opportunities on the labour market, improvement of spatial harmony, etc. (*Strategia rozwoju powiatu zgorzeleckiego na lata 2004-2014*, 2001).
- Lubański County – development of touristic, spa and recreational functions, improvement in the situation on the local labour market, development of a high-quality educational offer (especially vocational training), high-quality of all possible elements of the environment, revitalization of obsolete and devastated urban areas, improvement in the quality and level of life of the local inhabitants (*Strategia rozwoju powiatu lubańskiego*, 1999).

- Lwówecki County – economic development with a particular regard to the environment protection, taking advantage of the existing landscape values, development of tourism and rural tourism, ecological production of food, restructuring of the existing economic and social problems of the county (*Strategia rozwoju powiatu lwóweckiego 2010-2020*, 2010).
- Jeleniogórski County – poli-functional economy, market facilitation of the county (for investors and tourists), more intensive development of tourism functions, development of environmentally friendly industry, supplemented role of agriculture with regard to the dominant functions, diversified labour market, development of all potential spheres of infrastructure (technical, social, transport, touristic, etc.), sustainable development, etc. (*Strategia zrównoważonego rozwoju powiatu jeleniogórskiego 2006-2014*, 2006).
- Jelenia Góra Town – modern European town with well-developed many functions, one of the major centres of development in the Dolnośląskie Region, development of spa (in some districts), massive tourism, clean industry, higher functions (education, medical, services), development of infrastructure, creation of better spatial harmony, sustainable development (*Strategia rozwoju Jeleniej Góry na lata 2004-2015*, 2004).
- Jaworski County – improvements of the living conditions of its inhabitants, development of all possible kinds of economy (agriculture based on a relatively good-quality soils, industry and manufacturing based on a good location and tourism based on a cultural heritage – i.e., palaces and churches [church in Jawor town is on the UNESCO list]), development of the social and technical infrastructure (*Strategia rozwoju powiatu jaworskiego*, 2001).
- Kamiennogórski County – active participation in transnational cooperation, clean environment, complex and overall development of technical infrastructure, economy based on environmentally friendly small and medium sized industry, active tourism and specific agriculture, taking advantage of its transit location (the best transport connections with the Czech Republic in the whole of the Sudety Mountains), providing better accessibility to education, medical services and other elements of social infrastructure (*Plan rozwoju lokalnego powiatu kamiennogórskiego na lata 2007-2013*, 2008).

Based on this presented-above brief summary of the main visions of development of the counties, it is clearly evident that most of these county-districts build their development upon tourism, environmentally friendly industry and, in some places, also on agriculture. The quality of the existing landscape is also of huge importance for all of the counties. In addition, the development of any kinds of infrastructure is listed very high in the hierarchy of challenges.

On the regional and national level, there are rather general concepts of development than very specific ones which can really influence and impose the changes in the land use and land cover. In general, according to the vision of the regional government, the Dolnośląskie Region should become a nodal

region – with well-developed connections to the inland of Poland and also to neighbourhood countries. Also, importance of aspects of the social, economic and territorial cohesion within the region are pointed out. The internal connectivity not only can improve the region’s cohesion, but also is important for the full utilization of endogenous potential and to prevent out-migration from the peripherally located communes. On the maps below the concept of the creation of the highly developed net of internal and external connections of Dolnośląskie Region is presented (fig. 26). Special attention is given to the so-called “Sudety corridor” – which is to connect all major towns located in the southern part of the region (including Kamienna Góra, Jelenia Góra, Gryfów Śląski, Lubań and Zgorzelec, which are located in the Jeleniogórski subregion) to strengthen their potential for economic development.



3.4. Location

Generally the location of the Jeleniogórski subregion is one of the most peripheral one from the point of view of national and regional centres. For the vast majority of the subregion territory it takes above two-hour drive by car to get to Wrocław and about 7 hours to arrive in Warsaw (fig. 27). From the local point of view the distance to Wrocław is obviously much more important, but as is presented on the maps, only from the north-eastern part of the subregion (Jawor, Złotoryja) the accessibility is within one-hour travel-time. From the remaining parts of the region it is much longer distance – the greatest travel-distance is from the place of location of the brown coal mine (Bogatynia town).

Improvement of the accessibility is important for this subregion for at least two reasons. First one is concerned with the depopulating processes – when the accessibility to the main centres of development will have been better - then maybe some of the people will resign from migrating but decide to commute to work. Second, if the accessibility to that subregion will be much improved then it will be undoubtedly easier to attract new investors and new tourists.

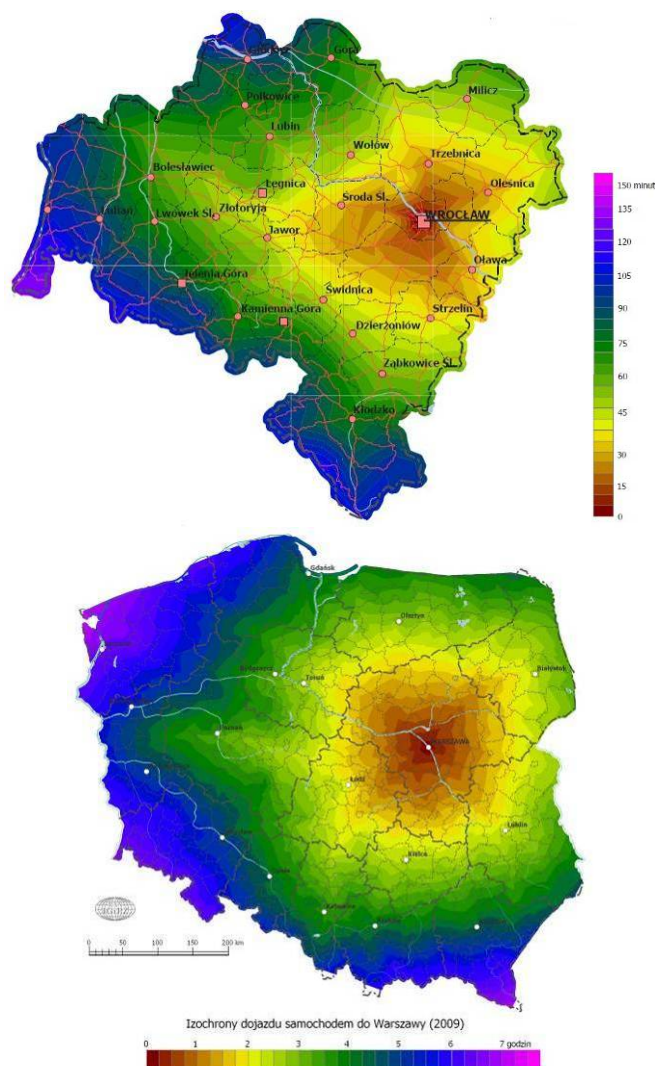


Fig. 27. Time accessibility by car to Wrocław and Warsaw, 2009

Source: Komornicki *et al.* (2010).

The general schemes of the road and rail network in the Dolnośląskie Region are presented on the maps below. Except for a few connections, on the whole, it is very monocentric network with only one key centre, i.e., the capital of the region – Wrocław. Generally the northern part of the Jeleniogórski subregion is quite well-connected with Wrocław via the motorway E40 and the reconstructed railway line Wrocław-Zgorzelec. More serious problems are associated with the connections from its southern part. For example, the average time-travel by train from Jelenia Góra to Wrocław (127 km by rail) is around three and a half hours.

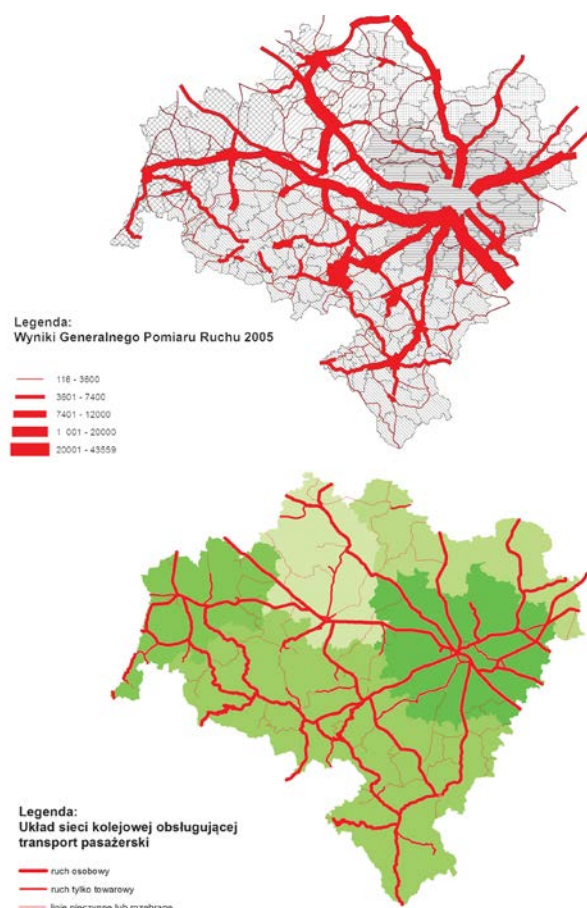


Fig. 28. Number of cars on the main roads in 2005 and railway network in 2010

Source: Błaszczyk, Majkut, Zathey (2010).

Location near the border, on the one hand, provides some advantages, but, on the other hand, these limited benefits were outweighed by even more acute disadvantages. Because of its border location, this subregion has been very often overlooked in terms of investments of major significance, such as location of industry or development of the transport systems. Some of the towns were even closed for some time (for example – Kowary, because of its location and mines of lead). Border of that subregion with Czech Republic has a mountainous character, that is why the development of a joint infrastructure or connections and cooperation was and still is difficult, especially in some parts of the subregion. In the last decade, some joint international projects have been initiated – mainly associated with the development of a common promotion and market facilitation of tourism. Few years ago direct rail

connections were opened in the vicinity of Karkonosze Mountains. Cooperation with Germany started at the beginning of 1990s – at first it was very rapid development of markets and services on the Polish side. In view of the differences in prices, it was very important factor underpinning development of private entrepreneurs. Later on, common bottom-up approaches started to occur between Polish and German institutions. A very good example are the projects carried out by one of the communes from zgorzelecki county (Pieńsk commune) – there have been the joint projects, for example, connected with building the bridge, opening bilingual kindergarten, organizing shared social and sports events, common market facilitation of the existing touristic attractions and as well plans to develop common technical infrastructure. In general, the development of the main functions of the Jeleniogórski subregion is not directly connected with or influenced by the borderland location. Such location results in, on the one hand, peripheral location in relation to regional centre, but, on the other hand, presents possibilities to support the projects from the programmes addressed for international cooperation.



Photo 9. Example of a common Polish-German cooperation – Pedestrian and bicycle footbridge Pieńsk – Deschka built within the Interreg Programme

Source: author's materials.

3.5. Conclusions in the context of land use

Concluding the general description of the said subregion, some of the key elements that impact the current changes of the land use should be underlined:

- (1) Overall socio-economic situation in this subregion is very much below the average level that is noted in the Dolnośląskie Region.
- (2) We can observe an outmigration from the subregion – with only few exceptions such as the suburban areas (especially around Jelenia Góra), however these zones are very narrow. Also, on the areas of great touristic and cultural value, people are migrating from bigger towns (mostly from outside of the subregion). New settlements are much more scattered. It leads to the chaotic development of spatial structures.
- (3) There is dichotomous process in settlement development. There are some villages, which are totally not inhabited, as well as there are some villages with good location and attractive landscape surroundings that have noted a considerable share of newcomers in last two decades.
- (4) There is one principal and basic reason for an outmigration – collapse of industrial functions which were dominating on these areas in the past.
- (5) High level of unemployment – collapse of many industrial activities; reduction in the previous employment in industrial factories cannot be compensated by employment offered by tourism institutions.
- (6) In the lowland part of the subregion, the big agricultural enterprises have appeared – process of consolidation of land can be observed. In the upland and mountainous part, the agriculture plays less and less important function in spatial organization and economical structures.
- (7) The biggest tourist investments are now located in the touristic areas.
- (8) There still persists a stereotype that that region is very polluted and ecologically destroyed – the so-called “Black Triangle”. In the past, a number of large industrial factories did really produce a lot of pollutions – right now this situation has changed for the better. Now the quality of environment is much better.

4. ANALYSIS OF LAND USE CHANGES

4.1. Dynamics and directions of land use and land cover changes

As was described in the second chapter, land use in the Jeleniogórski subregion is greatly diversified – both by the structure and by the spatial disparities. In this chapter, a detailed analysis of the land use and land cover changes will be made based on detailed resolutions maps generated from the Corine Land Cover database.

At the beginning, just to remind, the land cover typology is presented, based on data from 1990-2006.

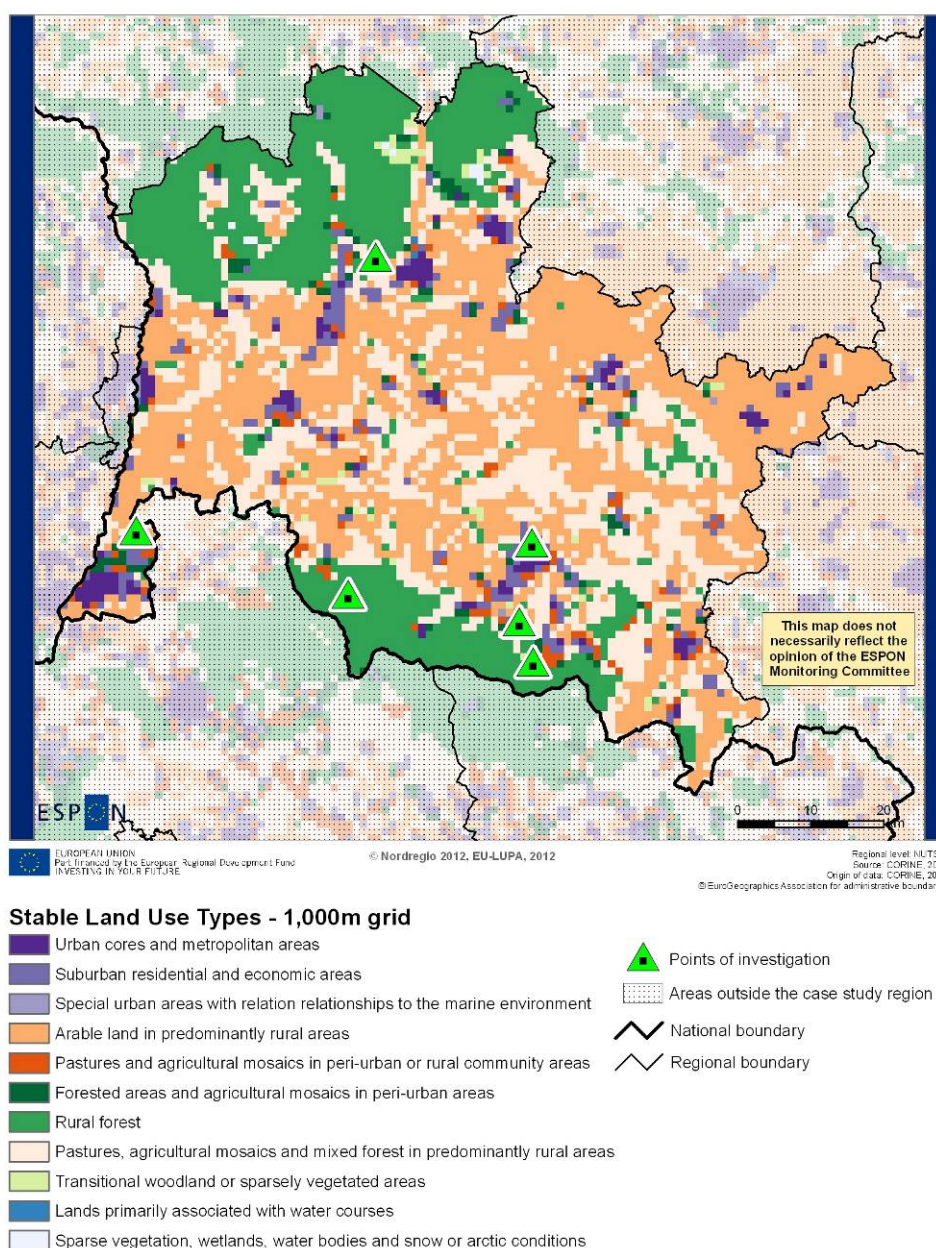


Fig. 29. Stable elements of land cover in the Jeleniogórski subregion

Source: Nordregio, based on Corine Land Cover

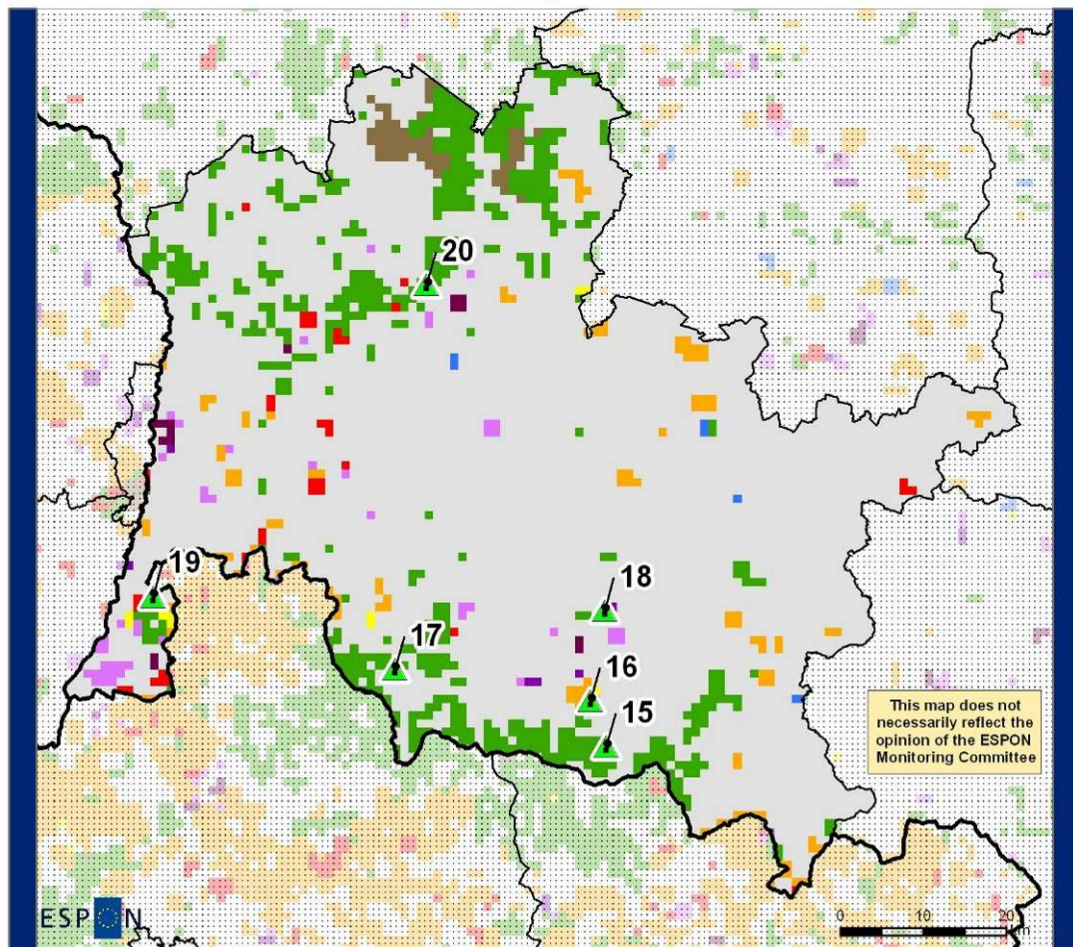
There are 44 Corine Land Cover classes. So altogether there can be 1936 possible combinations – 1892 of which could be classified as changes (44x43 possible one-to-one changes of classes) and 44 classified as “no change”. The total amount of flows was generated and grouped, by way of the special procedure prepared by Nordregio, in nine major land use processes:

- lcf1 Urban land management - Internal transformation of urban areas.
- lcf2 Urban residential sprawl - Land uptake by residential buildings altogether with associated services and urban infrastructure from non-urban land.
- lcf3 Sprawl of economic sites and infrastructures - Land uptake by new economic sites and infrastructures (including sport and leisure facilities) from non-urban land.
- lcf4 Agriculture internal conversions - Conversion between farming types. Rotation between annual crops is not monitored by CLC.
- lcf5 Conversion from forested & natural land to agriculture - Extension of agriculture land use.
- lcf6 Withdrawal of farming - Farmland abandonment and other type of withdrawal of agriculture activity in favour of forests or natural land.
- lcf7 Forests creation and management - Creation of forests and management of the forest territory by felling and replanting.
- lcf8 Water bodies creation and management - Creation of dams and reservoirs and possible consequences of the management of the water resource on the water surface area.
- lcf9 Changes of Land Cover due to natural and multiple causes - Changes in land cover resulting from natural phenomena with or without any human influence.

Basically, the classification of land cover flows distinguishes change between broad land cover classes and changes internal to these classes. Analysis of land cover flows allows for immediate visualization of processes taking place. What is important the Land Cover Flows are made in a hierarchical system – there are three levels of aggregation. So each of the classes of changes can be studied in much more detailed way when necessary.

As was mentioned in the second chapter, generally we have observed very small changes of land use in the Jeleniogórski subregion for the last two decades. This process is very well visible on the maps illustrating the land cover flows. Less than 2% of land changed its classification in the period between 1990-2006. More significant changes took place in the period 1990-2000 than 2000-2006. We can identify some places that underwent the suburbanization processes (concentrated only near Jelenia Góra and Zgorzelec), some areas of agriculture internal conversions and very locally water bodies creation (including one artificial lake Sosnówka near Jelenia Góra – surface area of 1.5 km², opened in 2001). But the most considerable changes were identified in the category “lcf7 - Forests creation and management”. These changes take place in the mountain areas as well in the

forest complex of Bory Dolnośląskie in the north of the subregion. Later, these changes of forest will be identified in a much more detailed way and also some detailed examples of changes are demonstrated in Appendix 1.



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Regional level: NUTS X
Source: CORINE, 2012
Origin of data: CORINE, 2012
© EuroGeographics Association for administrative boundaries

Land Cover Flow Types

- Points of investigation
- National boundary
- Regional boundary
- Urban land management
- Urban residential sprawl
- Sprawl of economic sites and infrastructures
- Agriculture internal conversions
- Conversion from other land cover to agriculture
- Withdrawal of farming
- Forests creation and management
- Water bodies creation and management
- Changes of Land Cover due to natural and multiple causes
- Case study region
- Areas outside the case study region

ID	Land cover flow	Land use type	Coordinates (WGS84)	
15	Forests creation and management	Pastures, agricultural mosaics and mixed forest in predominantly rural areas	50°46'36"N	15°43'51"E
16	Conversion from other land cover to agriculture	Forested areas and agricultural mosaics in peri-urban areas	50°49'38"N	15°42'37"E
17	Forests creation and management	Rural forest	50°52'37"N	15°22'53"E
18	Urban land management	Suburban residential and economic areas	50°55'23"N	15°44'44"E
19	Forests creation and management	Forested areas and agricultural mosaics in peri-urban areas	50°58'26"N	14°58'40"E
20	Forests creation and management	Rural forest	51°17'17"N	15°29'03"E

Fig. 30. Land Cover Flows typology in the Jeleniogórski subregion in the years 1990-2006

Source: Nordregio, based on Corine Land Cover.

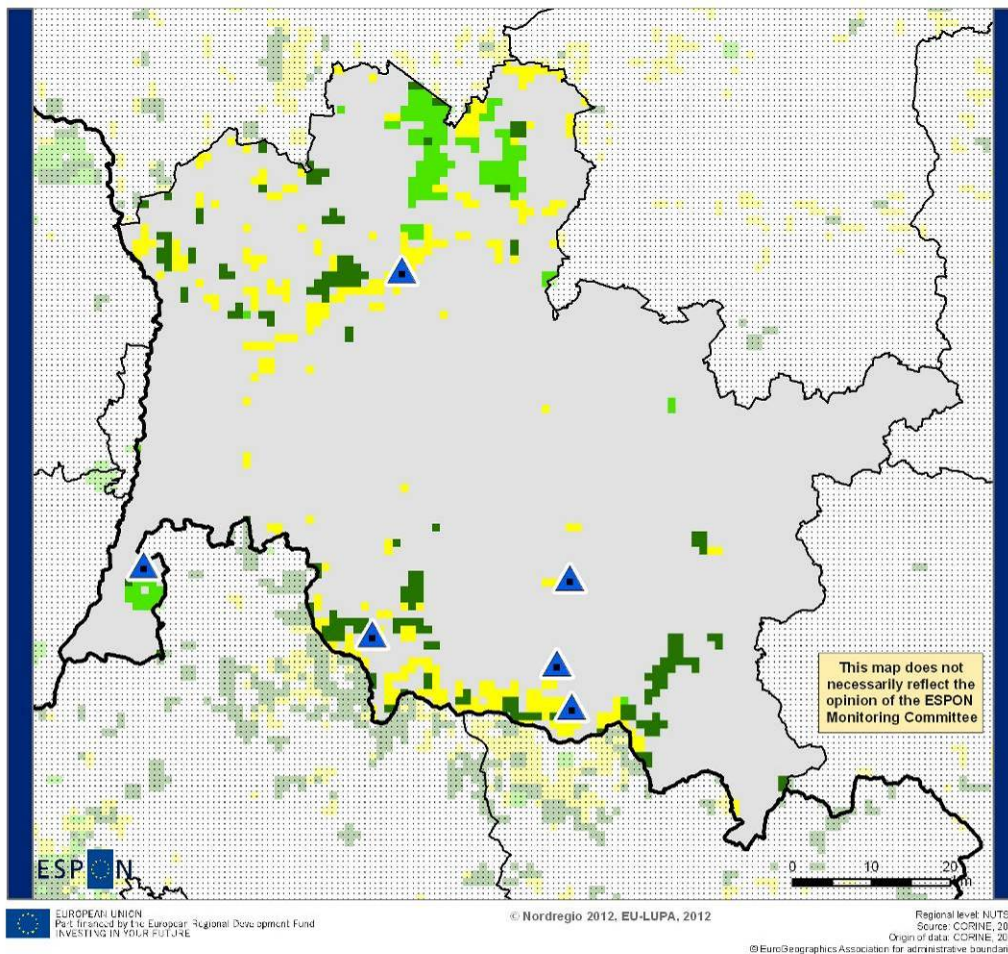
Detecting of forest changes is a little bit problematic by Corine Land Cover, due to the cycle of 10 years analysis. In such a period of time only part of the

shrubs are tall enough to be identified as trees. But because of the fact that in the Jeleniogórski subregion the biggest changes take place in the class "lcf7", it is worth to make some detailed analysis of these changes. As was mentioned before, the used typology has a hierarchical character, which helps to make a more detailed analysis. Following subdivisions of flows can be identified within class "lcf7 - Forests creation and management":

- lcf71 Conversion from transitional woodland to forest - Conversion from transitional woodland to broadleaved, coniferous or mixed forest, taking place when shrubs can be detected as trees.
- lcf72 Forest creation, afforestation - Forest creation and afforestation take place on all previously non-agricultural landscapes where new forests can be identified. Extension of transitional woodland shrub over non-agricultural land is recorded as afforestation. Conversions from transitional woodland to broadleaved, coniferous or mixed forest are not a creation of forest territory and are therefore registered separately (lcf71).
- lcf73 Forests internal conversions - Conversions between broadleaved, coniferous and/or mixed forest.
- lcf74 Recent felling and transition - Conversion from broadleaved, coniferous and/or mixed forest to open semi-natural and natural dry land resulting more likely from felling. Due to uncertainties, all are provisionally considered as transitional states of forests.

First subcategory "lcf71 conversion from transitional woodland to forest" has a very mosaic character and is located in southern and northern part. Location of that class in southern (mountain) part is connected with the ecological disaster which took place in that area in the 1980,s, when due to a high level of industrial pollution and the so-called "acid rains" many of forests were destroyed. Then in the 1990,s thanks to enormous efforts of woodmen that area started to be forested again. So the reasons for that changes are the growth of trees enough to be detected as a forest. In the north it is connected with normal forest production – Bory Dolnośląskie are subject to economic use, and simply this means that some parts of it are cut down for wood and new plantations are created. So the identified changes indicate places where previously the trees constituting part of the old forest were cut down and now trees in the new forest are growing.

Second subcategory "lcf72 Forest creation, afforestation" is concentrated on the areas where the training military zone is located. After the collapse of communism, the Soviet Army left Poland (in 1993) and also the total number of soldiers in Polish army was much reduced. That is why the military training zones are not used now as intensively as previously and some new environment processes can be detected in such areas.



Land Cover Flow Types

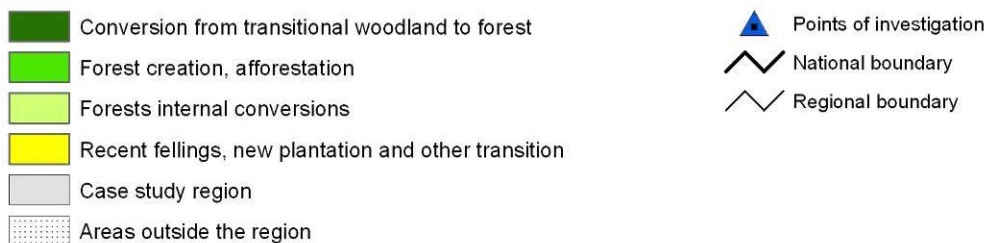


Fig. 31. Land Cover Flows characteristics within class “lcf7” in Jeleniogórski subregion in the years 1990-2006

Source: Nordregio, based on Corine Land Cover.

Third subcategory “lcf74 Recent felling and transition” is concentrated in two areas. In the southern part it is connected both with the activities undertaken by the woodmen and national park in the 1990,s after that ecological disaster in the former decades and as well with re-utilization of previously abandoned meadows. In the north we can identify a linear structure of that subcategory. It is directly associated with the construction of the motorway A4 (E40), which was opened in 2009. The data from CLC of 2006 identify those changes as conversion from forest to open dry land – this is because in that period the trees were cut down for the future investment but the construction works started in 2007.

Concluding, it can be stressed that almost all of the changes presented on the Land Cover Flows typology can be explained by the environmental and socio-economic processes which took place in the Jeleniogórski subregion in the years 1990-2006 and are directly or indirectly affected by the previous conditions and general trends of development both in Poland and in this area during the transformation period. Undoubtedly, there are more changes of the land use or land use functions, which have not been detected in the typology, owing to the fact that the resolution of those changes is too small to be identified. Lack of good spatial planning in Poland leads to mosaic and chaotic development of some investments – built-up areas or industrial plants. When the changes in land use are very scattered and dispersed, the CLC data are not able to identify those changes. Description of some examples of detailed changes of land use are given in Appendix 1.

4.2. Trends, actors and drivers of the changes (micro and macro scale)

The processes of land use in this subregion are very differentiated. In general we can observe a stabilization in land utilization and land cover – the changes of land use presented in the second chapter, based on statistical data and also in the previous chapter based on CLC data, do not show intensive changes. Due to peripheral location, an outmigration and a big share of agricultural lands and forests, such situation is natural. But in some parts of the subregion these changes are very intensive, even though they are not registered by the official statistics. Those changes are mainly concentrated in the suburban areas and touristic zones. Intensive development of houses (recreational or normal) and elements of tourism infrastructure are affecting the economical and functional structure of the area more than the land cover changes. This is so because the present-day settlements and production plants are scattered and do not form a complex structures. So in some delimitations and statistics these areas are still registered and classified as an agricultural areas. And even if they are registered properly, their influence and importance in the social, economic and functional structures are much higher than in land use structures.

Such processes can be described and explained by the intensity of the influence of both types of land use utilization. Extensive land use – like agricultural or forests – even if it covers a higher share of area, does not have such big influence as intensive land use – like built-up, industrial or touristic areas. So even a small, from the point of view of surface, changes from extensive to intensive in land use, have important influence on the functional and economic structures.

According to that we can point out the two main actors of land use changes – they are primarily local representatives with prevalence of extensive land use, and external investors as well as developers who are transferring the land use into much more intensive way. The examples of the representatives from the first group are – farmers, national park, State Forest company, ecologists, and the example of the second group are – newcomers (in the suburban and touristic areas), owners of touristic infrastructures, investors in the industrial activities, etc. Thus, generally, all the actors that influence the land use changes, can be divided into those two groups. Of course, there are a lot of

exceptions, but on the whole the representatives of the first group are much more conservative (in terms of land use), live in the subregion and are characterised by a high level of the so-called “territorial capital”. On the other hand (also with a few exceptions), the second group is much more liberal, does not care much about the spatial planning, and the economic profits are the most important factors behind their activity. As was stated by one of the interviewed experts (see Appendix 2): “the most effective and desirable actors are those who offer the new work places to people and provide incomes for the budgets of local self-governments. However, more often than not the biggest investors come from the outside of the subregion in question and it is the financial benefits that are of much importance to them, rather than the environment protection, cultural values or the so-called territorial capital”.

The present-day processes in terms of land use are affected by the two central drivers of change – legal status and economic pressure. Legal status of spatial planning in general is a good tool for a proper administration and management by local governments in Poland. But since local plans are not obligatory for the local governments, the situation is very diversified in different communes. Some of these have local plans and some of these do not possess such documents at all, or have them partially prepared – usually these communes that exert the most intense pressure on the land use changes (suburban, touristic). In such places the second driver – economic pressure – can play the crucial role. All the local governments want to have a more intensive utilization of land – as it is tantamount with a greater number of investors, increased incomes for the local budget and better opportunities for employment on the local labour market. The economic pressure from external investors is more intensively felt on the attractive areas (with better location, accessibility, higher touristic values, etc.). And if these areas do not have local plans or else are not protected as highly valuable land from the environmental point of view, then the economic pressure is “winning” and it is easier for external investors to develop and change the land in any directions they may wish. That causes some serious problems with a proper land management, leading to spatial chaos, confusion of functions and fragmentation of land use.

4.3. Contemporary and potential conflicts

Situation described in the previous chapter can be treated as one of the most important and common descriptions and causes of spatial conflicts. The intensive functions and intensive land uses are competing with extensive ones. We can provide some examples of these competitive pressures – intensive and massive tourism development versus environment protection, built-up areas and some industrial plants versus agricultural function, heavy industry versus environment, spatial harmony versus new built-up areas and new industrial plants (they are located not in old industrial areas, but are very dispersed, which leads to chaotic way of spatial organization). Some spatial chaos is created by the mixture of functions and investments. Almost always the more intensive investment and more intensive function are successful in this competition. The more intensive land use has to be protected by legal framework or by spatial planning tools – eg. protection of national park, of very good soils for agricultural production or well-prepared spatial planning (eg. local plans). But it has to be stressed that these conflicts are not common

for all the subregion are – they are rather limited to some places and localities. So the conflicts have a local character and are connected with location of individual objects – eg. some production plants which were built too close to built-up area or a mine which started its operation in a very quiet touristic village close to the old palace. Previously, the industry was adversely affecting the environment of these areas on a much larger scale – which in combination with acid rains made that the pollutants were deposited on vast stretches areas.

It can be also indicated a very interesting example of spatial conflicts within the framework of a tourism function. Some of the tourist activities are mutually exclusive – for example, in one small town (Świeradów Zdrój) we can witness a development of spa functions which need quiet and the so-called „benign atmosphere of health”, and, at the same time, massive growth of skiing functions – i.e., new investments in ski lifts. Till now there are no problems, but in the future, it is possible that a serious conflict may arise associated with that. But fortunately this is only isolated example, which does not cover the whole of the subregion territory.

As regards the future, the two potential causes of spatial conflicts ought to be mentioned, which can be characteristic for the subregion. There are now and also will be in the future numerous problems connected with the construction of retention reservoirs. The main reason for the problem is associated with vertical agreement between central government and local self-governments – there is no good co-operation on this issue. Also there are social problems – building retention reservoirs is associated with the necessity of removal of some settlements. The second cause of possible conflict in the future is a result of climate conditions (climate change) and development of skiing functions. Those ski resorts which were developed in the lower altitudes can have problems with snow and face bankruptcy risk.

But generally also in the future these conflicts can have rather local character – thus it is difficult to predict now their intensity or localization. Analysing spatial conflicts from a broader perspective, it can be concluded that in the future the macroeconomic factors will be of crucial importance – these will decide whether spatial conflicts arise. If there is an economic decline, there will be less and less investors and visitors, and at the same time less spatial conflicts. And also it has to be remembered that in the areas with high quality of landscape, suitable and attractive for many other functions and purposes, the spatial conflicts are absolutely normal. Multifunctional character causes that many actors want to pursue their own concepts or ideas.

4.4. Scenarios

As was mentioned earlier, the potential conflicts will have a local character in the future, so they should not influence the general trends of land use in the Jeleniogórski subregion. The contemporary changes and processes should be continued in the future – it means that agriculture and forest will continue to have a privileged status in the land use structure, while undoubtedly from an economic point of view services and industrial functions will be of much importance.

According to local strategies and the regional strategy of socio-economic development, in this subregion, co-existence of the touristic, agricultural, industrial, forests, ecological functions and land use is envisaged. So the present-day processes will be further supported and strengthen by the management of the local and regional governments. Since it is much difficult to build and prepare different scenarios of land use management and land use changes, we are inclined to assume the continuation of the contemporary trends.

5. MULTIFUNCTIONALITY OF LAND USE

5.1. Functional differentiations

For ages rural areas have been associated only with agriculture. No other function than bio-productive has been distinguished for these areas. As a result of economic development of Poland, agriculture lost its dominant share in creation of GDP, and employment in agriculture is no longer main source of income for considerable number of rural inhabitants. Dichotomous division into rural and urban area has been progressively vanishing; functions, so far characteristic almost only for urban areas, have appeared also in rural ones (Kostrowicki, 1976). Already in the mid-1980s Stola (1987) wrote that social and economic development results in quantitative and qualitative changes in ways of management in rural areas, as well as in work and life-conditions of people living there.

In the recent ten years, in Polish scientific and planning literature, many functional typologies have been conducted. Below, the three selected ones will be presented.

Bański and Stola (2002) for their functional typology of rural areas eight diagnostic features chose on the basis of which they defined ten functional classes that were gathered in five groups. The whole Dolnośląskie Region, as well the Jeleniogórski subregion, is characterised by a high-level mixture of the functions. In the analysed subregion there is a co-existence of non-agricultural functions, forestry functions, touristic functions, agriculture functions, as well as equal share of various functions.

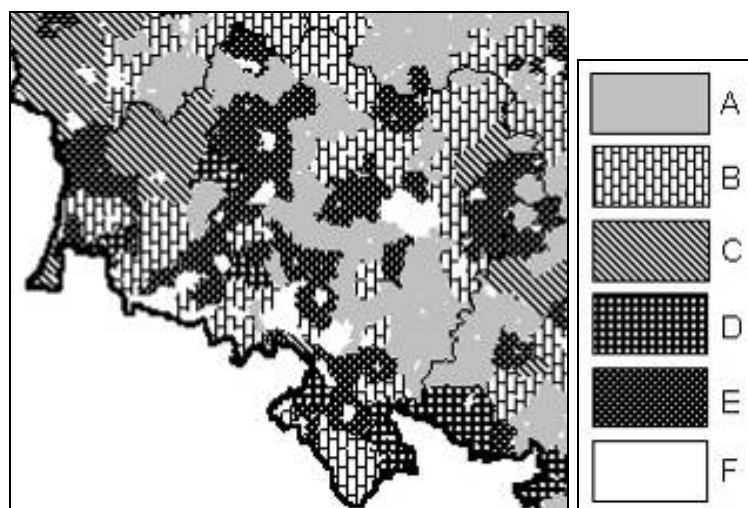


Fig. 32. Functional classification of rural areas in the Dolnośląskie Region

A – prevalence of agricultural functions, B – equal share of various functions, C – prevalence of forestry, D – prevalence of recreational functions, E – prevalence of non-agricultural functions, F – cities

Source: Bański, Stola (2002)

Other typology prepared by Bański (2009) was based on ten indicators (e.g., population density, share of arable lands, share of market agriculture, number of hotel's beds, etc.). 8 functional types were delimited. In the analysed Jeleniogórski subregion, the majority of communes were classified into the

category “mixed functions”. It means that it was not possible to detect one dominating function for this area. Additionally, some of the communes around Jelenia Góra were classified as a multifunctional, few as a touristic and those located in the eastern part as an agricultural. This classification is in some way similar to the previous one and again the aspect of multifunctionality of that area is stressed.

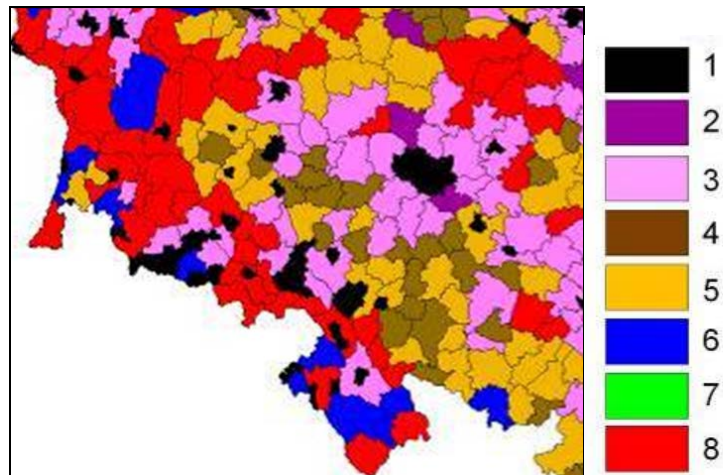


Fig. 33. Functional classification of communes in the Dolnośląskie Region

1 – towns, 2 – urbanizing areas, 3 – multifunctional rural areas, 4 – agricultural areas, 5 – prevalence of agricultural functions, 6 – tourist and recreational functions, 7 – forest functions, 8 – mixed functions

Source: Bański (2009)

The last presented typology has a little bit different character, because is based mostly on location factors, rather than on sectoral features (as the previous two). In the typology presented by Śleszyński and Komornicki (Śleszyński *et al.*, 2007) the most important factors were administrative functions, functional connections, transport corridors – in that typology authors utilised results from the ESPON typology of Functional Urban Areas. According to that typology, again the Jeleniogórski subregion is characterised by a very differentiated functional structure. There is Jelenia Góra with the surroundings subject to urbanization processes, in the southern (mountain) part there are areas with developed tourism functions, some communes are specialized in industry, etc. The comparison of that area with other subregions in Poland (especially in the eastern part) shows, big heterogeneity of that subregion.

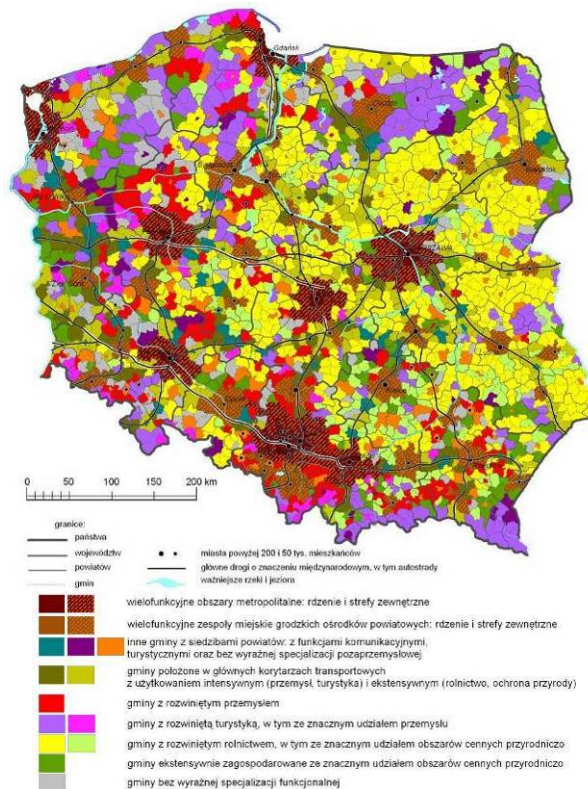


Fig. 34. Functional classification of communes in Poland, 2007
 brown – FUA, yellow – agriculture, violet – tourism, red – industry, green – high quality of environment

Source: Śleszyński *et al.* (2007).

All of the above presented typologies show big heterogeneity of functions of that area, and at the same time big mixture of it and polifunctional structure of that subregion. Generally, a few very important elements of functional diversity of the Jeleniogórski subregion can be listed such as:

- Housing function – as was already mentioned, this area is characterised by a polycentric model of development of settlements, the urbanization index is in the order of 62%. There, a set of different sized towns is located, each of which one of the most important functions is housing. Around the biggest settlements (especially around Jelenia Góra) the suburbanization processes take place (for more detailed description see the Appendix 1).
- Touristic functions – these are mostly concentrated in the southern part of the subregion, but at the same time they are very diversified internally. Different kinds of tourism activities are offered, eg. holidays, health stays, congress tourism, sighting, etc. Also, a wide variety of sport activities can be identified in the region: winter sports (skiing, cross-country ski), bicycle roads, mountain trekking, spa, extreme sports, aerial sports, etc.

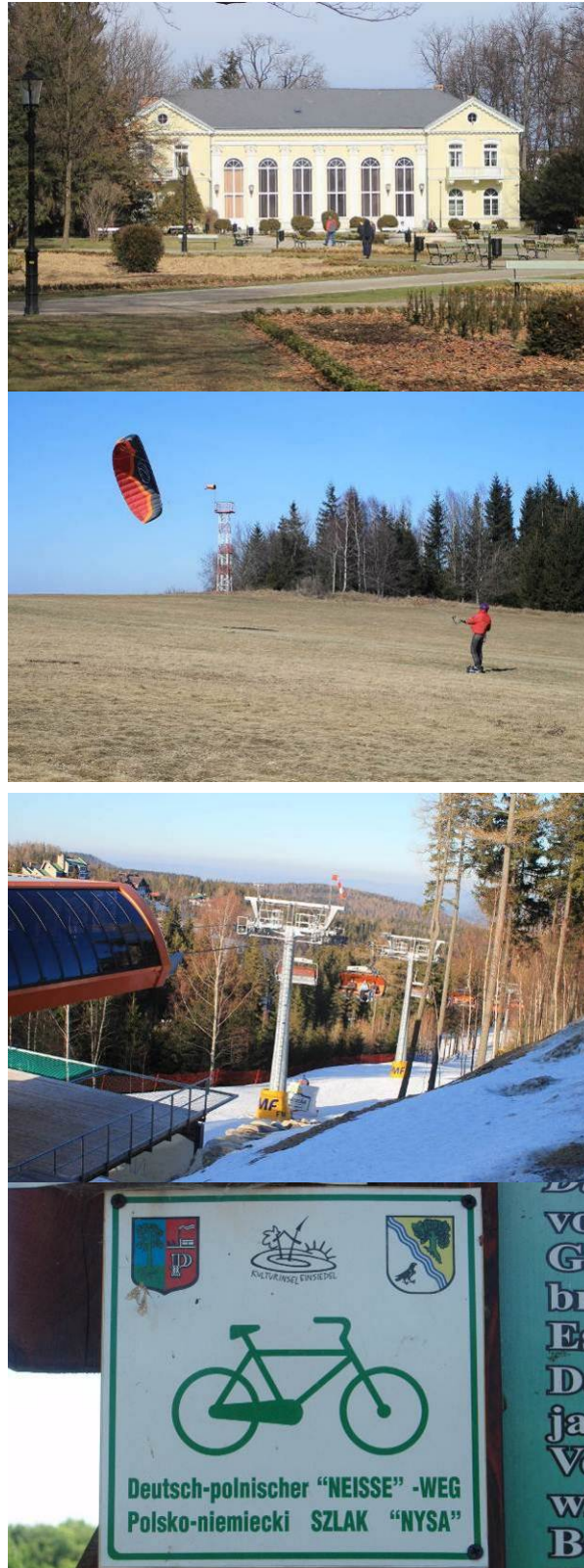


Photo 10. Examples of different tourism activities in Jeleniogórski subregion – spa (health resort in Cieplice Zdrój) and active recreation

Source: author's materials.

- Agriculture functions – prevalence of grasslands in the mountains part and arable land in the eastern and western part. On the areas with better quality soils the more demanding cereals are cultivating (eg.

wheat), while on the areas with poorer quality of soils less demanding ones (eg. rye).

- Industrial functions – as was previously mentioned, the area was characterized by a very high level of industrialization in the past decades. During the transformation period many of the factories collapsed or reduced its production, but still some of these are under operation and also new companies are starting production. Some of them adapt the old buildings, but for majority of them it is much easier and cheaper to build new constructions. The biggest industrial zone in the analysed subregion, and at the same time in Poland, is located in the area near the brown coal mine.



Photo 11. Examples of newly constructed industrial plants in the last few years

Source: author's materials.

- Forest functions – most of forests are under public administration. Forests have wood production, touristic and military training ground functions.
- Transport functions – in the subregion, the two main important transport and transit corridors are located. One is the motorway A4 (European code E40) which connects Germany (Saxony) with a number of large Polish cities (Wroclaw, Upper Silesia Conurbation, Krakow) and the Ukrainian border. The second one are the connections to the Czech Republic.

5.2. Current multiple uses of land

Multifunctionality can be analysed at least on the two different spatial levels – local and regional. When analysing that topic on the regional level it can be noticed that the Jeleniogórski subregion as a whole can be called a multifunctional territory. As was described detailed in the previous chapter, there are very important functions such as: housing, services, industry, transport, tourism, forest, agriculture, mining, settlement and others. Intensification of each of these functions is different in each of the area. Five functional zones can be delimited: (1) Jelenia Góra (multifunctional town), (2) highly industrialized south-western part of the subregion (the brown coal mine), (3) mountain area – the Sudety Mountains (domination of tourism function), (4) lowland area with domination of agriculture and (5) in the north complex of forests. The importance of each function is different from different perspectives as well – economical or land use. When taking into account economical perspective much more important functions will be industry, tourism, transport and services, and the opposite is the case - when taking into account the land use perspective much more important will be forestry and agriculture. Co-existence between many different functions is very natural in the subregion and is in line with the main strategic idea that is pursued in this area. The number of functions has remained rather the same during the recent two decades – but other functions started to be more important and some less important – a revaluation of importance of functions was made. Previously, there was a marked domination of the industrial function. Nowadays, we can point out that in the mountainous part there is a fast development of the tourism function, in the northern agricultural one and in some localities there is a development of the industrial functions.

When talking about multifunctionality from the local perspective, it can be stressed that the biggest changes in the land use and functions are observed on two types of areas: suburban zones and touristic areas. On the suburban zones there is intensification of the land use, more intensive functions (as housing or production) are appearing. On touristic areas, open agricultural land is transformed into the settlements of recreational houses and tourist infrastructure. Intensification of functions can be measured again from the economic and land use perspective. The most common changes are transformation of arable land into the built-up areas (but only in the mentioned zones of highest pressure – suburban and touristic).

Also it can be pointed out that development of tourism function takes place in many directions and is very diversified. Nowadays tourism is very complex in the Jeleniogórski subregion, being not based only on one or two kinds of tourism activity.

5.3. Potentiality of multiple uses of land

In the future we can observe a further outmigration of inhabitants from this subregion, generally, and concentration of population in the suburbs of major towns (especially around Jelenia Góra). Those demographic processes should be taken into account when creating the development strategies of this area, and planning the development of new or existing functions and investments.

In the future, this area will still be of multifunctional nature, and should develop in such a way. In recent years, there has been a considerable decrease of agricultural functions. But this area is most suitable for sheep or cattle breeding, because of a high share of grasslands. Lack of agricultural activity resulted in collapse of agro-food industry in this subregion. So in the future some activities and programmes should be implemented to increase the role of agriculture based on utilization of grasslands – sheep or cattle breeding. These activities will certainly improve the quality of environment (there will be no abandoned pastures) and affect positively tourism by improving the cultural and traditional values of this area.

Tourism function will still remain an important one. The problem with development of tourism function is that tourists concentrate their activities in a few settlements, few places, but all the region want to develop on the base of tourism activity, however, it is rather impossible. Also in the future the problem of development of tourism function can be connected with the climate conditions (climate change). Those ski resorts which were developed in the lower-altitude places may face problems with snow and go bankrupt.

The development of industrial functions should be pursued in such a way that will not have negative impact on environment (the so called “clean industry”). In such densely populated areas, as the Jeleniogórski subregion, it is only the development of the secondary economic sector that could provide enough work places to stop the negative demographic processes.

In the future, the macroeconomic conditions will be of utmost importance for creation of spatial conflicts and multifunctional development. If economic decline takes place, there will be less investors and visitors and at the same time less possibilities for multifunctional development.

6. POLICY CONTEXT OF LAND MANAGEMENT

6.1. Land use in the regional/local documents

The division of competences between different tiers of government (different levels of government) was briefly described in third chapter. As was mentioned there, the communes have the greatest competences in terms of land use, spatial planning and land management. These are responsible for indicating directions of spatial planning and local development. Among other things, the communes are responsible for: water management, commune roads, water supply systems, the sewage system, public transport, the sports facilities and tourism including recreational grounds and, what is also very important in this analysis, spatial harmony and real estate management.

So the basic competences in the spatial planning are exercised on the level of communes. Everything in that matter depends on the activity of the local self-governments. Tools that communes have at their disposal are correct, but their implementation is highly unsatisfactory. From one standpoint, spatial and economic planning faces a growing pressure from external investors and developers. Understandably, each of the commune wishes to have the greatest possible income, so each investor is welcomed warmly by them. Preferred are these investments which tend to use the land in a more intensive way. So, all the communes want to intensify the utilization of the land. At the same time, the problem is with the existing law – according to spatial planning, the local plans in spatial planning are recommended, but they are not obligatory. That is why many areas are short of detailed coverage by spatial planning, and the decision concerning a development of land in this way or another lies in the responsibility of the communal authorities. This situation is not good for a proper spatial planning and often gives priority to economic activity over the spatial harmony. In the analysed area of the Jeleniogórski subregion, we can observe that a very high share of the land is covered by the very detailed local plans. Unfortunately, in the areas where is felt the highest pressure from developers on the land, i.e., in the touristic zone of the Karkonosze Mountains, the share of the local plans is the lowest.

Because of such situation, some of the regulations has to be put in force on the higher levels of government – for example, the regulations pertaining to nature and environment protection belong to the responsibility of the state. Of course, the state and regional responsibilities are concerned also with such things as: ports and airports, air traffic control, railways and inland transportation, basic legislation on environmental protection and on woodlands and forestry. But the responsibilities for activities which affect mostly the land use lies in hands of local governments. Also, it is the local initiatives and activity that decide what amount of external financial resources will be obtained by the local government and which kind of initiatives will be implemented in the communes. So the local development results almost directly only from the activity of local leaders. Those initiatives are influencing the changes in land use – new roads, new social infrastructure, etc. – that is why, they also have to be mentioned and taken into account. It must be stressed again that the highest responsibility in these matters lies in hands of local governments.

7. CONCLUSION

Overall socio-economic situation in the Jeleniogórski subregion is much below the average level in the Dolnośląskie Region. The subregion has problems with an outmigration, high level of unemployment, collapse of many industrial plants and poor accessibility to main centres (especially Wrocław). That is why in some strategic and scientific publication it is perceived as the “problem area”.

In the Jeleniogórski subregion there are important functions such as: housing, services, industry, transport, tourism, forest, agriculture, mining, settlement and others. Intensification of each of these functions is different in each part of the area. One can delimitate five functional zones: (1) Jelenia Góra (multifunctional town), (2) highly industrialized south-western part of the subregion (the brown coal mine), (3) mountain area – the Sudety Mts. (domination of tourism function), (4) lowland area with domination of agriculture and (5) in the north, complex of forests.

Total changes in the land use have not been very intensive for last 20 years. On the whole, the domination of two types of land use can be mentioned – agricultural land and forestry. But, in some places, there is a concentration of other types of land use and the changes are much more visible. The most considerable changes are noted in the areas with the highest pressure of different activities, different functions – especially there where areas are attractive for many actors.

However, in general, the spatial conflicts have a local character. That is why the contemporary changes and processes in land use should be continued in the future – it means the privileged position of agricultural and forest functions in the land use structure, while, from the economic point of view, for certain the most important activities will be services and industrial functions.

According to local strategies and regional strategy of socio-economic development, in the subregion will be co-existence of the touristic, agricultural, industrial, forests, ecological functions and land use. So the present-day processes will be supported and strengthened by the management of the local and regional governments. Owing to this, it is difficult to build and prepare different scenarios for land use management and land use changes than these that assume continuation of the contemporary trends.

The greatest challenge for the proper land management in the Jeleniogórski subregion is a complex and holistic planning – connection of sectoral planning (socio-economic) with territorial one. This will help to achieve the sustainability in planning. That two parts of strategic planning – sectoral and territorial – should be equal to each other, and, at the same time, treated in a coherent way. Also, a higher share of land should be covered by the local plans – it will certainly help to preserve the spatial harmony.

LITERATURE

Atlas of Polish Agriculture, 2010, Institute of Geography and Spatial Organization PAS, Warsaw.

Bański J., 2009, *Typy obszarów funkcjonalnych w Polsce*, IGSO PAS, Warsaw.

Bański J., Stola W., 2002, *Przemiany struktury przestrzennej i funkcjonalnej obszarów wiejskich w Polsce*, Rural Studies, vol. 3, IGSO PAS, Warsaw.

Bielecka E., Ciołkosz A., 2003, *Wyznaczenie obszarów o ograniczonych możliwościach produkcyjnych rolnictwa*, [in:] Ciołkosz A. (ed.) *Charakterystyka rolniczej przestrzeni produkcyjnej Polski*, GUS, Warsaw, pp. 111-129.

Błaszczyk M., Majkut R., Zathay M., 2010, *Analiza stanu i procesów integracji społeczno-gospodarczej, instytucjonalnej i przestrzennej regionu. Dokonanie analizy dotyczącej koegzystencji funkcji ochronnych oraz rozwoju systemów komunikacji i sieci infrastruktury w województwie dolnośląskim*, DAWG, Wrocław.

Ciok S., 1991, *Sudety – obszar problemowy*, Wrocław University, Wrocław.

Ciok S., 1994, *Wybrane obszary problemowe Polski Południowo-Zachodniej*, Wrocław University, Wrocław.

di Gregorio A., Jansen L.J.M., 1997, *A new concept for a land cover classification system*. Proceedings of the Earth Observation and Environmental Information 1997 Conference. Alexandria, Egypt, 13-16 October 1997.

ESPON Atlas – Mapping the structures of the European territory, 2006, Federal Office for Building and Regional Planning, Bonn.

Frenkel I., Rosner A. (eds.), 1995, *Atlas demograficzny i społeczno-zawodowy obszarów wiejskich w Polsce*, PTD, IRWiR PAN, Warsaw.

Komornicki T., Bański J., Śleszyński P., Rosik P., Świątek D., Czapiewski K., Bednarek-Szczepańska M., Stępnia M., Mazur M., Wiśniewski R., Solon B., 2010, *Ocena wpływu inwestycji infrastruktury transportowej realizowanych w ramach polityki spójności na wzrost konkurencyjności regionów*, Ewaluacje, Ministry of Regional Development, Warsaw.

Kostrowicki J., 1976, *Obszary wiejskie jako przestrzeń wielofunkcyjna. Zagadnienia badawcze i planistyczne*, Przegląd Geograficzny, vol. 48/4, pp. 601-611.

Miszewska B., 2009, *Morfologia miast dolnośląskich*, [in:] Łoboda J. (ed.) *Dolny Śląsk – studia regionalne*, Wrocław University, Wrocław.

Pisz Z. (ed.), 2008, *Spójność społeczna Dolnego Śląska*, Economic University of Wrocław, Wrocław.

Plan rozwoju lokalnego powiatu kamiennogórskiego na lata 2007-2013, 2008, Kamienna Góra.

Potocki J., 2009, *Funkcje turystyki w kształtowaniu transgranicznego regionu górskiego Sudetów*, Wydawnictwo WTN, Wrocław.

Śleszyński P. (ed.), 2011, *Analiza stanu i uwarunkowań prac planistycznych w gminach na koniec 2010 roku*, IGSO PAS, Warsaw.

Śleszyński P., Bański J., Degórski M., Komornicki T., Więckowski M., 2007, *Stan zaawansowania planowania przestrzennego w gminach*, Prace Geograficzne, vol. 211, IGSO PAS, Warsaw.

Stola W., 1987, *Klasyfikacja funkcjonalna obszarów wiejskich Polski. Próba metodyczna*, IGSO PAS, Warsaw.

Strategia rozwoju Jeleniej Góry na lata 2004-2015, 2004, Jelenia Góra.

Strategia rozwoju powiatu jaworskiego, 2001, Jawor.

Strategia rozwoju powiatu lubańskiego, 1999, Lubań.

Strategia rozwoju powiatu lwóweckiego 2010-2020, 2010, Lwówek Śląski.

Strategia rozwoju powiatu zgorzeleckiego na lata 2004-2014, 2001, Zgorzelec.

Strategia zrównoważonego rozwoju powiatu jeleniogórskiego 2006-2014, 2006, Jelenia Góra.

Węclawowicz G., Bański J., Degórski M., Komornicki T., Korcelli P., Śleszyński P., 2006, *Przestrzenne zagospodarowanie Polski na początku XXI wieku*, IGSO PAS, Warsaw.

Appendix 1

Verification of land use changes typology in practice

Land use changes identified by Corine Land Cover typology were verified in practice by field study of six points in Jeleniogórski subregion. Verification were carried out by the sample of squares, where the changes were of different intensity and were processing in different directions. Process of verification consisted of several elements: analysis of the typology maps and satellite imagery, observation of points, perform photographic documentation and talking to local people about factors of changes.

Square 1 (Point 15 on Figure 30)

The geographical coordinates

N 50° 46' 36"

E 15° 43' 51"

Square 1 is situated in Karpacz town (settlement located on the level of around 600 meters a.s.l., just on the slopes of Karkonosze Mountains). In that town we can observed a very dynamic development of tourism infrastructure – in that square Hotel Gołębiewski. According to CLC Land Cover Flow typology the square distinguishes forest creation and management; land use type: pastures, agricultural mosaics and mixed forest in predominantly rural areas.

In Karpacz we can observed a very dynamic development of tourism infrastructure – especially new hotels, ski lifts, restaurants, etc. Previously it used to be a very small village, but slowly it change its functions into touristic ones. The rapid growth of tourism infrastructure take place especially in the last years. Some of the investments were very controversial – for example investigated Hotel Gołębiewski. This hotel is very large in comparison to surrounded houses and influenced a lot the spatial organization of the land structures, economic situation and number of tourists. To build that hotel, there were made a special changes in spatial local plans and still that construction raise some controversy. But from the other side it is example that mountain part of that subregion has potential for tourism development.

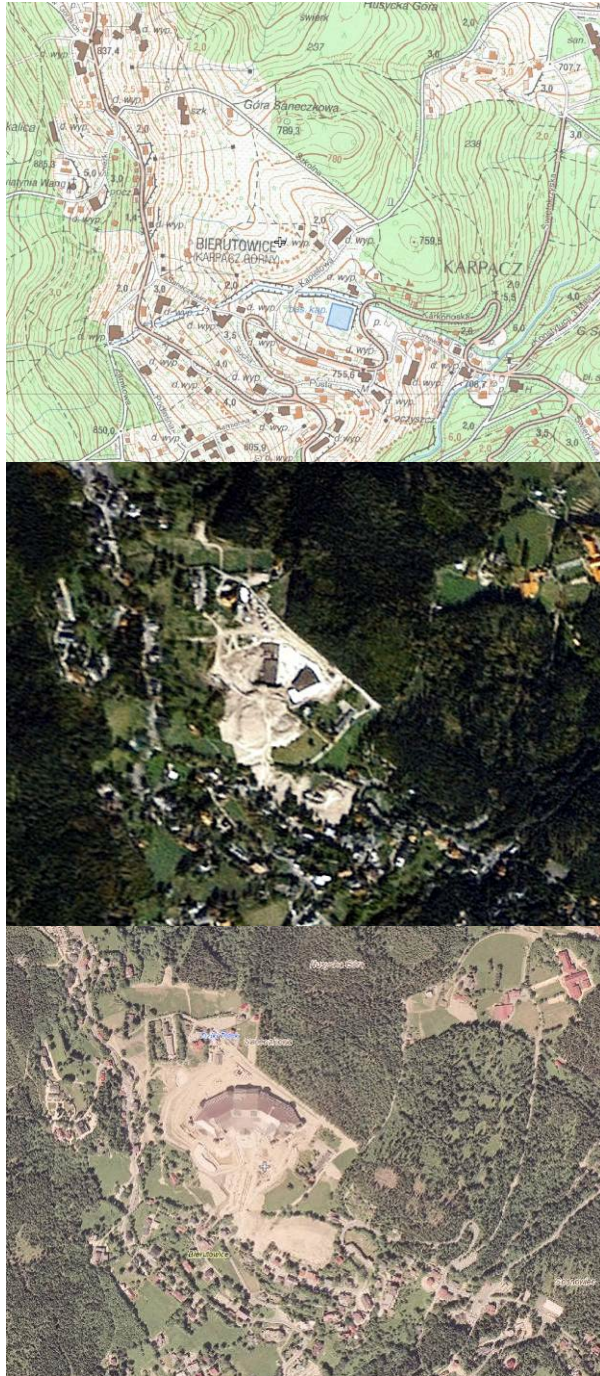


Figure 1a – Square 1 – Hotel building in Karpacz
Source: Geoportal (2012) and Google Earth (2012).



Photo 1a – Square 1 – Hotel building in Karpacz

Source: author's materials.

Square 2 (Point 16 on Figure 30)

The geographical coordinates

N 50° 49' 38"

E 15° 42' 37"

Square 2 is situated on the slopes of Karkonosze Mountains. According to CLC Land Cover Flow typology the square distinguishes conversion from other land cover to agriculture; land use type: forested areas and agricultural mosaics in peri-urban areas.

Probably there are some mistakes with geographical coordinates (system used), because that area should be rather identified as water bodies creation and management. This is an artificial lake Sosnówka, created in 2001, with the maximum capacity of 14 million m³ of water. The main reason of creation the lake, was anti-flood reasons, but also recreational purposes.

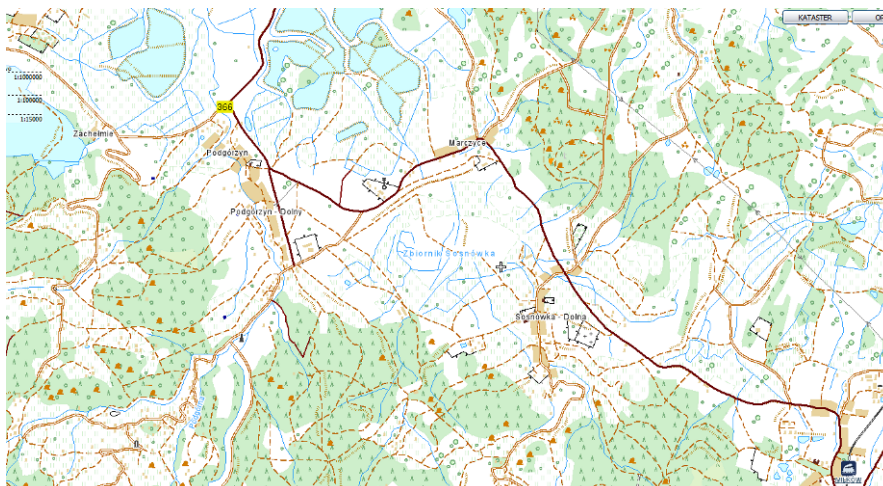




Figure 2a – Square 2 – Sosnówka – artificial lake (before and after creation)

Source: Geoportal (2012) and Google Earth (2012).



Photo 2a – Square 2 – Sosnówka – artificial lake

Source: author's materials.

Square 3 (Point 17 on Figure 30)

The geographical coordinates

N 50° 52' 37"

E 15° 22' 53"

Square 3 is situated on the slopes of Izerskie Mountains. According to CLC Land Cover Flow typology the square distinguishes forest creation and management; land use type: rural forest.

During the ecological catastrophe in the 1980. part of Izerskie Mountains were destroyed. Nowadays a new forest is created.

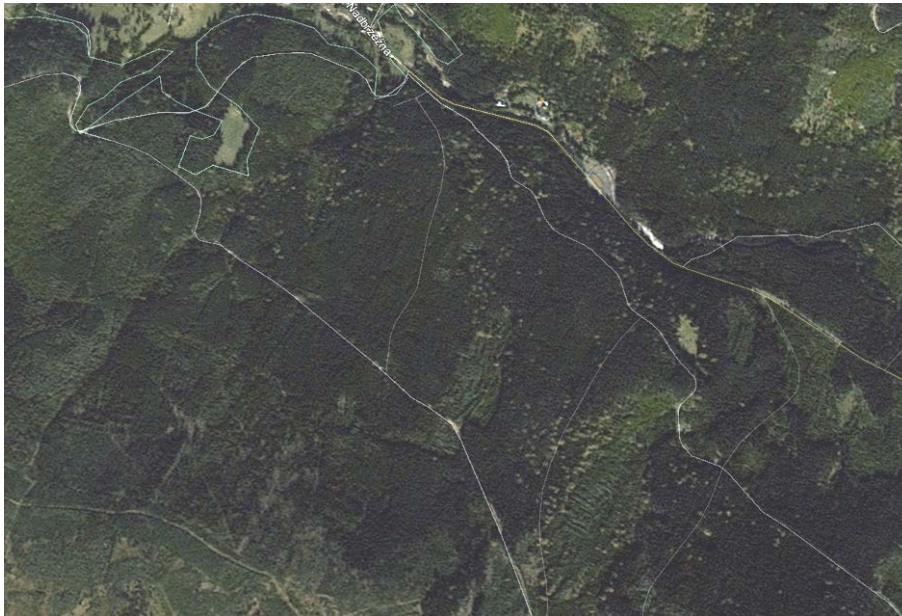
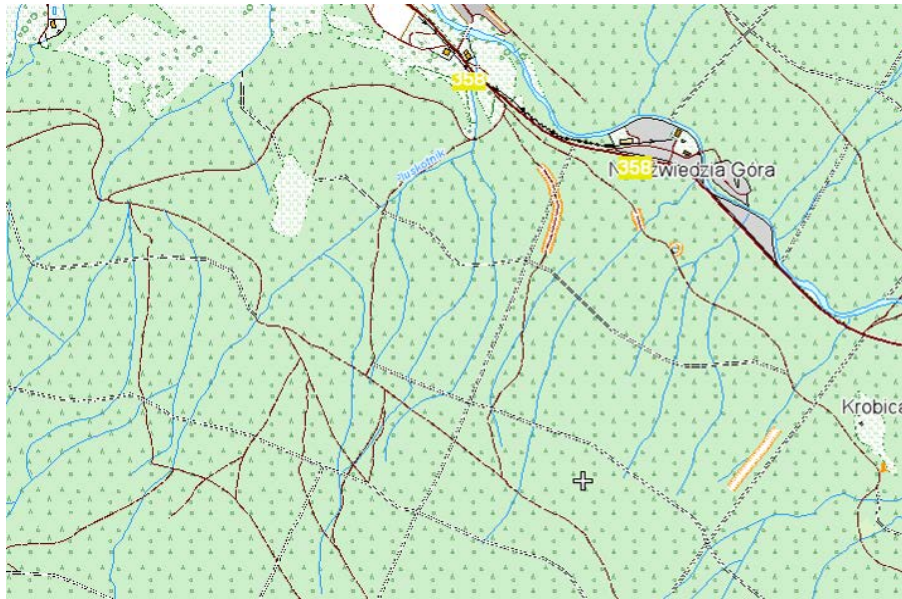


Figure 3a – Square 3 – Forest in Izerskie Mountains – near Świeradów Zdrój
Source: Geoportal (2012) and Google Earth (2012).



Photo 3a – Square 3 – Forest in Izerskie Mountains (new plantations)

Source: author's materials.

Square 4 (Point 18 on Figure 30)

The geographical coordinates

N 50° 55' 23"

E 15° 44' 44"

Square 4 is situated very close to Jelenia Góra – this is village and commune Jeżów Sudecki. In that village we can observe the high level of development of build-up areas. According to CLC Land Cover Flow typology the square distinguishes urban land management; land use type: suburban residential and economic areas.

Jeżów Sudecki is a village located along a road. Part of that settlement is within the border of Jelenia Góra town and part create the separate village. From the beginning of transformation period we can observed the rapid development of the build-up areas. On the previously agricultural land new houses appeared. That process is connected with two things – very close location to Jelenia Góra town (maximum 2-3 kilometres to the centre) and cheaper prices of land in the suburban zone in comparison to prices within the borders of the town. The investors of that new houses are mainly private people. The problems with such development is that it is not complex, not coordinated. That is why that new houses are still surrounded by the agricultural areas and the basic infrastructure is not developed (eg. the quality of roads is very bad).

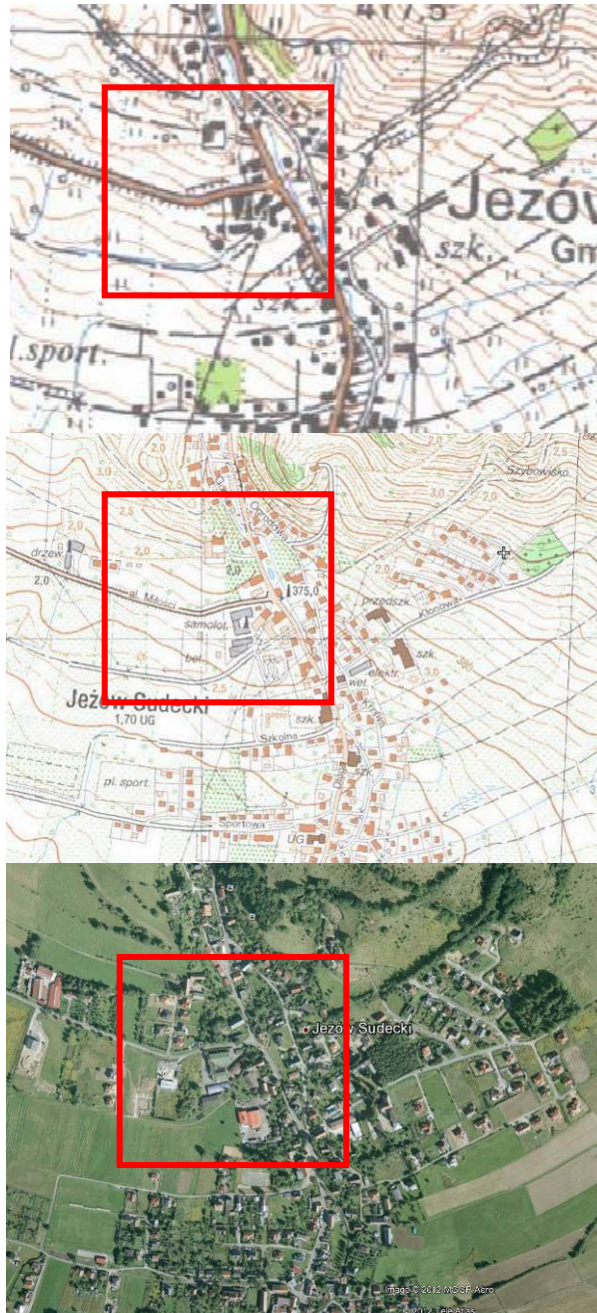


Figure 4a – Square 4 – Jezów Sudecki – suburban zone of Jelenia Góra
Source: Geoportal (2012) and Google Earth (2012).



Photo 4a – Square 4 – Jezów Sudecki – suburban zone of Jelenia Góra

Source: author's materials.

Square 5 (Point 19 on Figure 30)

The geographical coordinates

N 50° 58' 26''

E 14° 58' 40''

Square 5 is situated near Bogatynia, near brown coal mine. According to CLC Land Cover Flow typology the square distinguishes forest creation and management; land use type: forested areas and agricultural mosaics in peri-urban areas.

Due to intensive works in the brown coal mine near Bogatynia, new heap are created. Previously land used as agricultural or forest areas, is transferred into heaps, which are mainly covered by forest plantations.

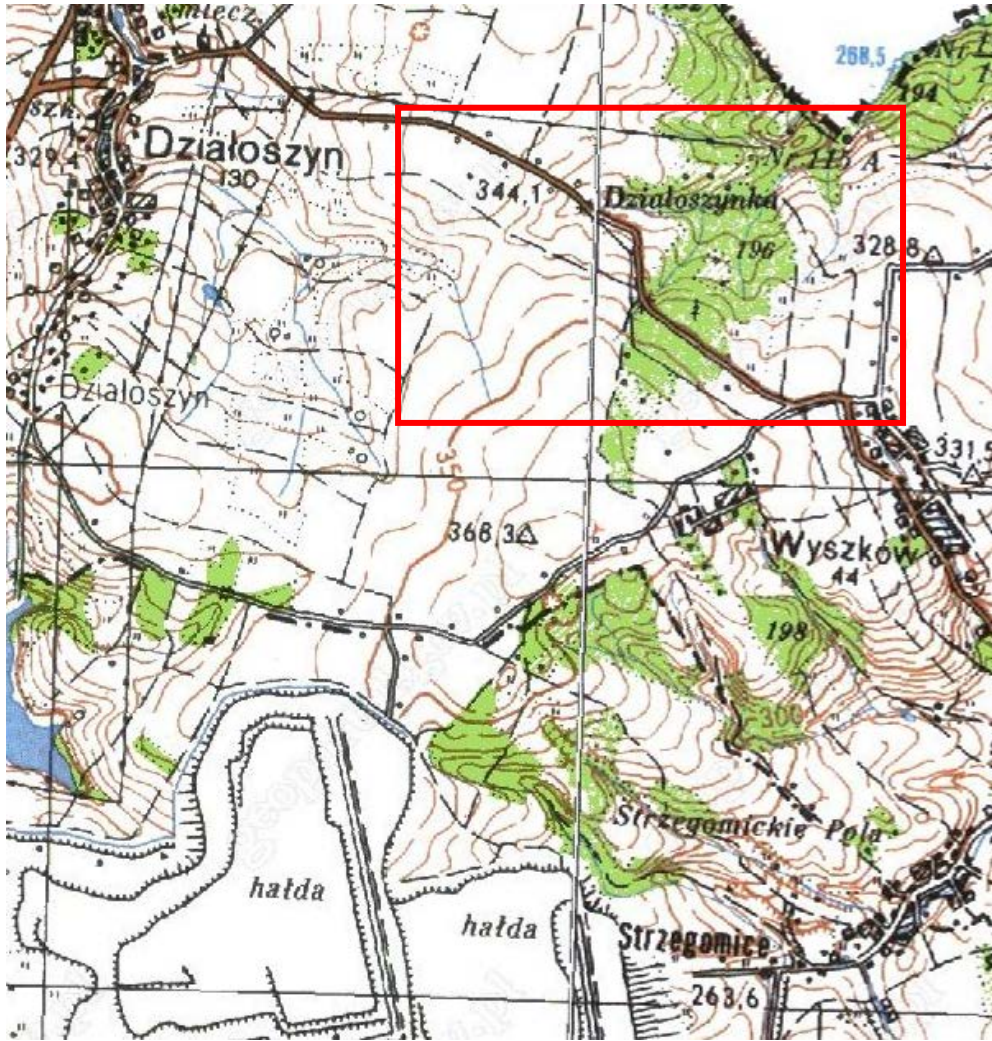


Figure 5a – Square 5 – Bogatynia – heaps (before and after the expansion)
 Source: Geoportal (2012) and Google Earth (2012).



Figure 6a – Square 6 – Motorway A4 – before and after construction
 Source: Geoportal (2012) and Google Earth (2012).



Photo 6a – Square 6 – Motorway A4
 Source: author's materials.

Conclusions

Generally the changes identified by the CLC typologies were confirmed. Some types are too general for the defined in practice changes, because they are depended on specific local conditions. Sometimes some local conditions are very unique and general types are much more broader. But the general types of land use and flows are in line with observed changes. Some mistakes may occurred due to different resolutions and different types of GPS systems used for identify the geographical coordinates.

Field study – interviews questionnaires

Region: JELENIOGÓRSKI SUBREGION

Place: JELENIA GÓRA

Person interviewed: JOLANTA BOREJSZO and WŁODZIMIERZ SŁODKIEWICZ

Secretary and Vice Secretary (Director of the Organizational and Legal Division) in the Office of the Jeleniogórski County

Interviewer: Konrad Ł. Czapiewski

Date: 05/03/2012

I. Socio-economic factors of land use change

1. Could you describe the main demographic processes in the region: migrations, birth rate etc.? What is their impact on land use?

Number of inhabitants in Jeleniogórski County has been stable in the last few years. We can observe some outmigration processes in Jelenia Góra town – that people are mostly moving to suburban areas of the town. Because of that, number of population in these rural communes has increased. Also on the areas with high touristic and cultural values people are migrating from bigger cities (mostly from outside of the subregion).

2. What are the main processes and trends of settlement? What is the impact of new settlements on land use and spatial organization? Is there a lot of new built-up areas? What are the forms: contiguous development, linear patterns, scattered development?

There are different kinds of new settlements – both complex settlements, as well as scattered settlements. It depends on numerous conditions – legal, institutional and environmental.

3. What are the main processes, directions of changes in the field of agriculture (extensification or intensification, changes of fields spatial structure and crops structure)?

A continuously decreasing role of agriculture on the suburban areas can be observed, as well as on the touristic areas (mainly mountainous parts). There are changes in the land use – from agricultural to built-up. But also large agricultural enterprises started to appear on these areas – there is an accumulation of land which previously belonged to state enterprises and small farms. A concentration of land in hands of very few owners is observed – very common linear internal borders between the fields belonging to different owners, now are slowly disappearing.

4. Are there such processes like: changing agricultural function of areas into other functions? Building-up areas of fertile soils? Increasing/decreasing the share of untilled land? Please describe briefly the processes concerning changes of agricultural land use.

See above.

5. What are the main processes in the field of industry and technical infrastructure (new plants, industry centres, roads, railways etc.)? How would you assess its influence on land use?

Local government very actively invests in technical infrastructure – with the use of external funds, mainly from the European Union. Revitalization and renovation of old and historic centres of towns and palaces is conducted by very active NGO organizations. Communes are mainly focused on hard infrastructure, rather than revitalization.

Jeleniogórski county was previously a very industrialized area, but right now many of the factories collapsed. Of course, some of the factories are still operating, as well as the new ones appear. New companies are mainly built in new places – mostly on agricultural lands, not in old industrial zones. Previously, Jeleniogórski county was an industrial-agricultural-services region, and now it is rather services-industrial-agricultural.

In the past decades, a train travel from Wrocław to Jelenia Góra took two hours, but now it is more than three and a half hours. The regional government invests a considerable amount of money in modernization of that train line.

6. What are the main processes in the field of tourism and services? Is there any development of tourism infrastructure (new hotels, holiday centres, swimming pools, tourist roads)? How intensive is the development in the spatial context (spatial extent of new areas used for tourism purposes etc.)?

The biggest tourism investments are now located in the touristic areas – especially in Karpacz town – huge hotels and infrastructural investments are using the old touristic objects (eg. swimming pools). Despite big controversy of locating such a large scale tourism infrastructure in small villages and towns – this shows that the county has a significant potential in development of touristic functions. Despite the big touristic objects, also smaller hotels are appearing in that region. Tourism is developing in many directions and is very diversified. Nowadays tourism is very complex on that area, it is not based only on one kind of touristic activity. Many tourism initiatives are initiated by the NGO organizations.

7. How would you describe and summarize the general conditions of economy in your region and its impact on land use? Please refer also to employment issues.

High level of unemployment – collapse of many industrial activities and employment in tourism institutions can't compensate that reduction in previous employment in industrial factories.

II. Environmental issues

1. Could you describe the main changes of natural areas in the last five decades (changes of forested areas, biodiversity, water conditions)?

Has the spatial extent and condition of areas of high nature value changed for the last five decades?

The Karkonoski National Park has not been enlarged in that period, but a new landscape park was established. Previously, many big industrial factories emitted a lot of pollution – nowadays this situation has changed for better. Presently, the quality of natural environment is much better. Very good examples provide the forests, which were almost totally destroyed in the 1980s because of the so-called “acid rains” – now we can observe a process of their regeneration.

Previously many rivers were out of any class of cleanness – because of intensive industrial production and lack of sewage systems. Actually this situation is changing – e.g. some species of fish are returning to the rivers, what has not been noticed for many years.

2. Please assess the main contemporary and future threats for natural areas (especially protected areas) in the region. How are they related to land use changes?

The main contemporary threat is liquidation of asbestos (which is still very often visible on the roofs). New areas will be added to the Natura 2000 list. Environment is a very important element for the development of tourism and therefore it will be a very significant factor and assets in the local development strategies and for the mentality of inhabitants.

3. Were there any natural disasters in the region in the last two decades which influenced the land use and land cover (floods, fires)?

That county, as a majority of the south-western Poland, suffered from a big flood in 1997, despite the fact, that in the region there are many so-called dry anti-flood reservoirs/tanks.

III. Multi-functionality

1. Please name socio-economic and environmental functions of land use in the region.

The most important function of the Jeleniogórski region is certainly tourism – and later on all the accompanying functions (e.g. services of general interests, infrastructure, services). There is a strategy of local governments for developing all the opportunities which can help to increase the role of tourism. Additionally, we can mention the role of such functions as: industry, agriculture and forestry.

2. Multifunctional land use - which of the functions in your region co-exist?

There are such functions as: tourism, production, housing, forestry and agriculture. Co-existence between many different functions is very natural in the region and is in line with the main strategic concept for that area.

3. Which of the functions are the most important in the context of land use?
4. Is the number of functions of land use increasing or decreasing?

The number of functions is rather the same – but other functions started to be more important and some less important – there was made a reevaluation of functions significance.

5. To which extent is the land in your region used in multifunctional way?
6. What kind of functions co-existence is:
 - a) the most effective?
 - b) the most desirable?
 - c) the most common?
 - d) the most difficult?
7. Which of the functions of land use are the most important for the future regional development?

The future development will be based on touristic functions.

IV. Spatial conflicts

1. Are there any conflicts related to land use? (As space is limited different actors compete to obtain the possibly largest area or their needs. For example: inhabitants strive to build houses, a businessman wants to put a plant or warehouse, there is a need to build somewhere sewage plant, administration of protected area tries to enlarge the area and so on).

We can observe local conflicts which are connected with location of individual objects – e.g. some production plants which were built too close to built-up areas or a mine which started to operate in a very quiet touristic village close to the old palace. Some conflicts were also connected with building big hotel objects in some mountainous small villages or towns. There were also some conflicts related to the development of new ski paths in the national park – but finally there was a compromise made.

2. What are the “competing” actors and functions (environmental, agricultural, industrial, settlement etc.)?

There are such actors as: private investors (entrepreneurships, private initiatives), local governments, NGO, ecologists.

3. Which of the actors are the most dynamic and successful in obtaining new land?

Because the priority development in the county is tourism, so all the possible regulations and conflicts are solved with giving the priority for tourism function development.

4. What are the most likely conflicts related to land use in future and what could be its impact on land use?

Previous conflicts had a rather point wise and local character, so it is difficult to anticipate some possible conflicts in the future.

V. Government and policy

1. Please assess the state and regional law concerning spatial management and planning in your region. Are legal rules effective in sustainable and rational management of land?

The basic competences in the spatial planning are on the level of communes (LAU2). Each of the commune desires to obtain as high income as possible, so every investor is welcome warmly by them. Each investment which is using the land in a more intensive way (and at the same time gives higher income to commune's budget) is favourable for the communes. So all the communes want to intensify the utilization of land. The regulations according to environmental protection have to be given from the state regulation, because communes do not think in such way.

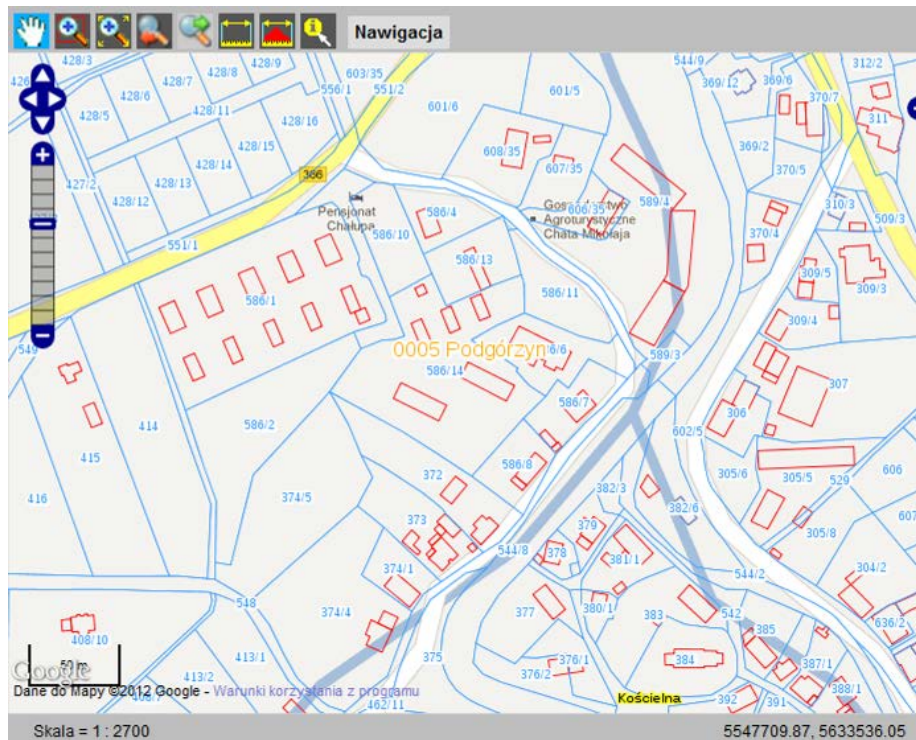
2. Is the local and regional administration effective in land management and in preventing and solving conflicts related to land use? (Please describe and assess the issue and give some examples. Summarize the role of local and regional administration in management of land use).

The effective local government is leading the commune in such a way, that we can observe local development in a desirable direction according to strategic documents.

3. Is there any monitoring of land cover changes in the region? (Please describe briefly).

The region is monitoring all the investments, which it is responsible for. The county would like to invest more money, but there are limitations of the budget.

Spatial monitoring is running only for the evidence of borders between houses and plots – a simple cadastre. It is rather evidence of the situation and not a tool for planning the development and creation of new functions. It is not a planning tool – rather a stocktaking tool. Certainly in the future the system will evolve to a more complex and holistic tool for spatial management. Right now there are no regulations regarding the architectural style or colour in which the new houses are constructed.



An example of cadastre map – source: <http://www.podgik.jgora.pl/mapa.html>

VI. Localization (depending on the region)

1. How land use changes are resulting from the vicinity of a state border (how the state border influences land use in your region)?

In some areas we can point out the development of some services, which can be somehow connected with the functioning of the state border – e.g. hotels in the vicinity of transit roads. But generally the influence of the border on land use is rather small.

VII. Land use in general

1. Please describe and summarize the major processes and trends of land use changes in the region over the last 50 years.

There have been large-scale changes in the rural areas – there is a lack of a traditional agricultural function; instead of that new functions appeared – tourism, and residential. There was made a revaluation of the importance of the dominating functions. The planning is much more complex. Also development of tourism functions is much more complex and the offer is more diversified. The fact, that many people would like to invest in that area proves that this county has great possibilities.

Region: JELENIOGÓRSKI SUBREGION

Place: KOWARY

Person interviewed: Prof. JACEK POTOCKI

Professor at the Wrocław University of Economics – Branch in Jelenia Góra, member of the Scientific Council of the Karkonoski National Park and member of the Advisory Group in the Marshal Office of Dolnośląskie Region, specialised in the tourism analysis.

Interviewer: Konrad Ł. Czapiewski

Date: 05/03/2012

I. Socio-economic factors of land use change

1. Could you describe the main demographic processes in the region: migrations, birth rate etc.? What is their impact on land use?

We can observe an outmigration from the subregion – the only exceptions are the suburban areas (especially around Jelenia Góra), but these zones are very narrow. There is one main and basic reason for that – collapse of industrial functions which were dominating on these areas. But depopulation of the mountain areas is a natural process – actually the biggest share of people is concentrating in the metropolitan areas.

2. What are the main processes and trends of settlement? What is the impact of new settlements on land use and spatial organization? Is there a lot of new built-up areas? What are the forms: contiguous development, linear patterns, scattered development?

We can observe the sprawl of built-up areas – nowadays the settlements are much more scattered. It leads to the chaotic development of spatial structures. For example it is easier, and it goes in line of what people prefer, to build new houses outside of the main centres of villages, even if there are free plots. The newcomers are from different parts of Poland, but mainly from Dolnośląskie Region.

3. What are the main processes, directions of changes in the field of agriculture (extensification or intensification, changes of fields spatial structure and crops structure)?

There is a big decrease of agricultural functions, but for example that area is predisposed for sheep or cattle breeding, because of a high share of grasslands. Lack of agricultural activity leads also to collapse of agro-food industry in that subregion. Grasslands are under use mainly because of different kinds of payments from the European Union.

4. Are there such processes like: changing agricultural function of areas into other functions? Building-up areas of fertile soils?

Increasing/decreasing the share of untilled land? Please describe briefly the processes concerning changes of agricultural land use.

See above.

- 5. What are the main processes in the field of industry and technical infrastructure (new plants, industry centres, roads, railways etc.)? How would you assess its influence on land use?**

After the collapse of many industrial activities during the transformation period in that subregion, none of the large companies were located there. Also before the transformation not so many investments were made in the industry. In the Czech side of the Sudetes it is completely different – the tourism function has developed only in a few locations. In the rest, industry has remained the prime function.

The opening of the motorway in the northern part of the subregion has not increased the level of entrepreneurship. The effect is even opposite – because of a decrease of traffic on the old transport roads, some services have lost their customers (e.g. hotels, restaurants or car services).

- 6. What are the main processes in the field of tourism and services? Is there any development of tourism infrastructure (new hotels, holiday centres, swimming pools, tourist roads)? How intensive is the development in the spatial context (spatial extent of new areas used for tourism purposes etc.)?**

Development of the tourism functions has a big influence on other areas of the subregion. The main reason of many decision connected with development of tourism functions are the financial aspects.

The main problem with development of tourism functions is that tourists concentrate their activities in a few settlements, few places, but all the region wants to developed on the base of tourism. It is however rather impossible. Even when some of the villages try to develop certain touristic attractions, it is not made in a complex way – each investor develops own activity. There is a lack of real cooperation between different stakeholders.

- 7. How would you describe and summarize the general conditions of economy in your region and its impact on land use? Please refer also to employment issues.**

The problem of the majority of the small towns and villages is that there was a significant domination of the industrial functions – collapse of industry led to the intensification of the socio-economic problems in that area.

II. Environmental issues

- 1. Could you describe the main changes of natural areas in the last five decades (changes of forested areas, biodiversity, water conditions)? Has the spatial extent and condition of areas of high nature value changed for the last five decades?**

There is still a stereotype that this region is still very polluted and ecologically destroyed – the so-called Black Triangle. But this is no longer true because there was made a real recultivation of that area. New animal species started to return on that area. The quality of natural environment is much better now.

Landscape parks are rather only artificial institutions. On the opposite, the Karkonoski National Park is really doing something, but there are some conflicts with other actors, which want to develop some activities and do not respect any environmental protection laws. There is even an opinion that the national park inhibits the economic development.

- 2. Please assess the main contemporary and future threats for natural areas (especially protected areas) in the region. How are they related to land use changes?**

Not asked.

- 3. Were there any natural disasters in the region in the last two decades which influenced the land use and land cover (floods, fires)?**

Not asked.

III. Multi-functionality

- 1. Please name socio-economic and environmental functions of land use in the region.**

In the past there was a great domination of the industrial function. Nowadays, we can observe that in the mountainous area there is big development of the tourism function, while in the north the agriculture evolves and in some localities there is a development of industrial functions (e.g. stone-pit or industrial plants).

- 2. Multifunctional land use - which of the functions in your region co-exist?**

Collapse of industry leads to significant economic and social problems. Local and regional government didn't have the idea what to do and in which way to develop that region. There was no good concept for the restructuring of the industrial sector during the transformation period. There was a conviction that the remedy on all problems would be the development of tourism. But in such area with such a high population density it is simply impossible. What is more, the development of tourism does not require well-educated workers. Jelenia Góra is in a relatively good economic condition, so is the Jeleniogórski county (tourism, services and industry) as well as Zgorzelecki county (big power plant, brown coal mine and vicinity of the German border), but other counties – such as kamiennogórski, lwówecki, złotoryjski, lubański – are in a much worse situation.

- 3. Which of the functions are the most important in the context of land use?**
- 4. Is the number of functions of land use increasing or decreasing?**

5. To which extent is the land in your region used in multifunctional way?
6. What kind of functions co-existence is:
 - a) the most effective?
 - b) the most desirable?
 - c) the most common?
 - d) the most difficult?
7. Which of the functions of land use are the most important for the future regional development?

There should be development of industrial functions in such a way, that will not have a negative impact on environment. Of course also the tourism, but in the areas and settlements still not discovered. The agricultural functions should be developed as well – especially cattle and sheep breeding.

IV. Spatial conflicts

1. **Are there any conflicts related to land use? (As space is limited different actors compete to obtain the possibly largest area or their needs. For example: inhabitants strive to build houses, a businessman wants to put a plant or warehouse, there is a need to build somewhere sewage plant, administration of protected area tries to enlarge the area and so on).**

There is a very interesting example of a spatial conflict in the frame of a tourism function. Some of tourist activities exclude each other – but in a small town (Świeradów Zdrój) there is a development of a spa function which requires tranquillity and the so-called “atmosphere of health” and massive skiing functions – new investments in ski lifts. Till now there are no problems, but in the future, it is possible that there will arise a conflict among these two activities.

Of course, there are some conflicts, such as: tourism vs. environmental protection, new settlement vs. agriculture, spatial harmony vs. new built-up areas and new industrial plants (they are located not in an old industrial areas, but are very dispersed, which leads to a chaotic way of spatial organization).

2. **What are the “competing” actors and functions (environmental, agricultural, industrial, settlement etc.)?**

The most effective and winning actors are that which offer the working places for people and income to the budget of local governments. Most often, the biggest investors are from the outside of the subregion and the most important factors for them are the financial benefits, and not the environmental protection, cultural values or the so-called “territorial capital”. Those investors, owners are not responsible for that area, do not care about the merit level of their offer, about the tradition or cultural heritage.

3. **Which of the actors are the most dynamic and successful in obtaining new land?**

See above.

4. What are the most likely conflicts related to land use in future and what could be its impact on land use?

In the future, the problem can be connected with the climate conditions (climate change) and development of the skiing functions. Those ski resorts which are at lower altitude could have problems with the lack of snow and eventually their attractiveness shall decline. Also in the future the macroeconomic conditions will be the most important for the creating (or not) the spatial conflicts. If there would be an economic decline, there could be less investors and visitors possibly resulting in less spatial conflicts.

V. Government and policy

1. Please assess the state and regional law concerning spatial management and planning in your region. Are legal rules effective in sustainable and rational management of land?

Everything in that matter depends on the activity of the local governments (communes). The tools that the communes have are probably correct but their implementation is very poor. Spatial and economic planning is the object of high pressure from external investors and developers.

2. Is the local and regional administration effective in land management and in preventing and solving conflicts related to land use? (Please describe and assess the issue and give some examples. Summarize the role of local and regional administration in management of land use).

Not asked.

3. Is there any monitoring of land cover changes in the region? (Please describe briefly).

Monitoring of spatial organization and spatial planning is conducted at a very basic level if at all.

VI. Localization (depending on the region)

1. How land use changes are resulting from vicinity of state border (how the state border influence land use in your region)?

Location near the border does not affect the development of that area, changes in spatial organization and land use. State border is still a barrier – maybe not institutional but mental and communicational (there are still no direct bus lines connecting the Polish and Czech towns).

VII. Land use in general

- 1. Please describe and summarize the major processes and trends of land use changes in the region over the last 50 years.**

Two important processes could be noticed: (1) socio-economic transformation and collapse of industry, (2) chaos in spatial planning and not very good laws for spatial planning and spatial organization.

Region: JELENIOGÓRSKI SUBREGION

Place: WROCLAW

Person interviewed: Dr SYLWIA DOŁZBŁASZ

Researcher in the Institute of Geography and Regional Development at Wrocław University, specialised in the trans-border and transnational analysis, especially on the border with Germany and Czech Republic.

Interviewer: Konrad Ł. Czapiewski

Date: 06/03/2012

I. Socio-economic factors of land use change

1. Could you describe the main demographic processes in the region: migrations, birth rate etc.? What is their impact on land use?

Demographic processes in that subregion are more polarised than on average in Poland. The processes of outmigration are more intense than average, as well population ageing. But the outmigration processes in that subregion are still much lower in comparison to the German side – Saxony region.

2. What are the main processes and trends of settlement? What is the impact of new settlements on land use and spatial organization? Is there a lot of new built-up areas? What are the forms: contiguous development, linear patterns, scattered development?

There is a dichotomous process. There are some villages, which are totally not inhabited, on the contrary, there are some villages with a good location and attractive landscape surrounding, with a big share of newcomers in the last two decades. New inhabitants build there their “second houses”. Mostly there are new houses – not adapted in architectural style to the old ones. The new houses are built mostly outside of old, central parts of the village.

3. What are the main processes, directions of changes in the field of agriculture (extensification or intensification, changes of fields spatial structure and crops structure)?

In the lowland part of the subregion, large agricultural enterprises appeared – there is a process of land consolidation to be observed. In the upland and mountainous part, the agriculture plays a less important function, that is still decreasing in spatial organization and economical structures.

4. Are there such processes like: changing agricultural function of areas into other functions? Building-up areas of fertile soils? Increasing/decreasing the share of untilled land? Please describe briefly the processes concerning changes of agricultural land use.

In the mountainous part, the agricultural areas are less and less utilized – formally they are still of agricultural function but the real utilization is different.

5. What are the main processes in the field of industry and technical infrastructure (new plants, industry centres, roads, railways etc.)? How would you assess its influence on land use?

Many of the towns in the Sudetes region based (or even depended) on the development of industrial function – collapse of industry led to socio-economic deprivation in many small towns and villages. There are difficulties in these settlements – they are looking for their chances for development, but it is not so easy. Post-industrial areas are partly re-used by new companies and partly they are abandoned. Many local governments are looking for chances by creating industrial zones, but because of a great competition it is difficult.

Thanks to the motorway in the northern part of the subregion the spatial accessibility has certainly improved. But it has not influenced the development of entrepreneurship. There is need to build the roads to connect the subregion with the motorway.

6. What are the main processes in the field of tourism and services? Is there any development of tourism infrastructure (new hotels, holiday centres, swimming pools, tourist roads)? How intensive is the development in the spatial context (spatial extent of new areas used for tourism purposes etc.)?

There is a significant and clearly visible division of the subregion into two main zones according to development and importance of tourism – in the mountainous part it is very important and in the western and northern parts much less important. Development of tourism functions is noticed also outside of traditional touristic centres. Touristic function is the only one which has a transnational character. The investments are influencing the increase of the role of transborder tourism. Development of transnational tourism initiatives – of course mainly in the mountainous part – is created by the bottom-up initiative.

7. How would you describe and summarize the general conditions of economy in your region and its impact on land use? Please refer also to employment issues.

There have been such activities in the subregion which influence the spatial organization and land use to a great extent – extractive industry, tourism, suburbanization, etc.

II. Environmental issues

1. Could you describe the main changes of natural areas in the last five decades (changes of forested areas, biodiversity, water conditions)? Has the spatial extent and condition of areas of high nature value changed for the last five decades?

There has been an improvement of all statistics concerning the quality of natural environment – this has resulted from the restructuring of industry and a great effort

made by the forestry management – forestation of the Sudetes mountains affected by the “acid rains” in the 1980s. Very positive changes – connotation with the “Black Triangle” identity is no longer the case. The mentality of inhabitants in accordance with the “environmental thinking” is changing much more slowly.

2. Please assess the main contemporary and future threats for natural areas (especially protected areas) in the region. How are they related to land use changes?

Firstly, pressure on the environment in the areas with domination of mines is and shall remain high, but there are also recultivation activities conducted. Secondly, mountainous areas – on these areas there will be pressure from the tourism function. There is some dichotomy – tourism in these areas is a very important function, but its influence on the environment will be increasingly visible.

3. Were there any natural disasters in the region in the last two decades which influenced the land use and land cover (floods, fires)?

There are some ideas of building the flood tanks – but unfortunately many of them are still at the stage of planning. The whole system of anti-flood protection does not function, as it should.

III. Multi-functionality

1. Please name socio-economic and environmental functions of land use in the region.

In the Jeleniogórski subregion, five functional zones can be distinguished: (1) Jelenia Góra (multifunctional town), (2) very industrialized south-western part of the subregion (brown coal mine also known as lignite), (3) mountainous area – the Sudetes (Sudety) (domination of tourism function), (4) lowland area with domination of agriculture and (5) in the north complex of forests.

2. Multifunctional land use - which of the functions in your region co-exist?

Definitely, this subregion can be called a multifunctional one. Many functions coexist next to each other and it is difficult to point out the dominating one, because they are very spatially differentiated.

3. Which of the functions are the most important in the context of land use?

4. Is the number of functions of land use increasing or decreasing?

There are changes in the importance of some functions, but the new ones are not appearing. There is certainly an increase concerning the importance of tourism and services functions, a decrease of significance concerning industrial and agricultural functions and stabilization of the extractive industry (mainly mining).

5. To which extent is the land in your region used in multifunctional way?

6. What kind of functions co-existence is:

- a) the most effective?**
- b) the most desirable?**
- c) the most common?**
- d) the most difficult?**

7. Which of the functions of land use are the most important for the future regional development?

In the future such functions will be important as: tourism, services and industry (but there will be no new zones of industry but rather in specific localisations). There will be no new protected areas.

IV. Spatial conflicts

- 1. Are there any conflicts related to land use? (As space is limited different actors compete to obtain the possibly largest area or their needs. For example: inhabitants strive to build houses, a businessman wants to put a plant or warehouse, there is a need to build somewhere sewage plant, administration of protected area tries to enlarge the area and so on).**

There is a conflict between mining and environment – but new regulations lead to the improvement of that situation (e.g. new filters). Previously, the influence of the industry affected large areas – together with rains, the pollution were deposited on large areas. Another conflict is related to the development of tourism and environmental protection. Some spatial chaos is created by the mixture of functions and investments. The biggest role in that matter is in the hands of local governments. They are supporting the development. Delimitation of industrial zones does not always bring success, sometimes the investors' interests are different and this leads to spatial conflicts. Not sufficient transparency of some decisions of the local governments caused some problems. But more and more often the local society is showing the bottom-up initiatives.

- 2. What are the “competing” actors and functions (environmental, agricultural, industrial, settlement etc.)?**

Competing actors: local government, entrepreneurship, inhabitants, ecologists. Different directions of the competing line are: local institutions and local people versus external investors, which do not have the territorial capital and only the economic profit seems to be important.

- 3. Which of the actors are the most dynamic and successful in obtaining new land?**

It is differentiated, but most often the winning actors are those, which offer more intensive utilization of land. But also important are the national or European regulations which support the development of more extensive land use and less intensive functions (e.g. national park).

4. What are the most likely conflicts related to land use in future and what could be its impact on land use?

Creation of flood tanks – there are many problems related to that topic. The main one is concerning the vertical agreement between the central government and local self-governments – there is no satisfactory co-operation on that line. Also there are also social problems – building flood tanks requires relocation of some settlements. Another possible conflict is between tourism and environment. In the regional strategy of development, it is stressed, that the extraction industry will return to that region – so it could be in conflict with development of housing and tourism.

V. Government and policy

1. Please assess the state and regional law concerning spatial management and planning in your region. Are legal rules effective in sustainable and rational management of land?

Actually the law and institutional assets are not effective in proper spatial planning. The easiest thing will be national regulations, that all settlements should have obligatory local plans for spatial organization. Perhaps, in general the whole procedure is correct and transparent, but because it is not obligatory, is therefore not effective. Creating the local plans is expensive, but sometimes it is much easier for the local governments not to have plans – they can create development freely, but at the same time it is a much more chaotic way. It should be decided on the governmental level that the plans are obligatory.

2. Is the local and regional administration effective in land management and in preventing and solving conflicts related to land use? (Please describe and assess the issue and give some examples. Summarize the role of local and regional administration in management of land use).

The role of public administration is crucial in planning regional and local development, it will not cause any spatial conflicts. There is a lack of social consultancy and merit background of the local government to run some good initiatives.

3. Is there any monitoring of land cover changes in the region? (Please describe briefly).

There is a lack of any spatial monitoring. Unless a specific case appears in media, nobody is interested in the results of investors' activity.

VI. Localization (depending on the region)

1. How land use changes are resulting from vicinity of state border (how the state border influence land use in your region)?

Location near the state border has a real and important influence on the spatial organization and human activities. First, there is a development of infrastructure

(transport, anti flooding systems), than development of common tourism products – creation of an integrated touristic market.

VII. Land use in general

- 1. Please describe and summarize the major processes and trends of land use changes in the region over a last 50 years.**

See above.

Region: JELENIOGÓRSKI SUBREGION

Place: WROCLAW

Person interviewed: Dr HELENA DOBROWOLSKA-KANIEWSKA

Head of the regional analysis units in Dolnośląskie Agency for Economic Cooperation (DAWG) – agency running European and regional projects and co-operates with the Marshal Office of Dolnośląskie Region.

Interviewer: Konrad Ł. Czapiewski

Date: 06/03/2012

I. Socio-economic factors of land use change

1. Could you describe the main demographic processes in the region: migrations, birth rate etc.? What is their impact on land use?

There are processes of depopulation – especially in the mountainous part of the subregion. Especially young people are migrating from that area. We can observe such relation – young people from Jelenia Góra or other big towns mostly migrate to study in Wrocław, while people from smaller towns and rural areas move to study in Jelenia Góra – there are some university branches located in Wrocław.

2. What are the main processes and trends of settlement? What is the impact of new settlements on land use and spatial organization? Is there a lot of new built-up areas? What are the forms: contiguous development, linear patterns, scattered development?

Many industrial activities collapsed during the transformation period – this affected negatively the population processes but also the deprivation of some built-up areas. Jelenia Góra is a “vital” town – it is the subregional centre of development. The town has some problems related to restructuring, but not to the extent as other parts of the region. Development of tourism function leads to development of recreational housing.

3. What are the main processes, directions of changes in the field of agriculture (extensification or intensification, changes of fields spatial structure and crops structure)?

There are no significant chances for the development of agricultural activities.

4. Are there such processes like: changing agricultural function of areas into other functions? Building-up areas of fertile soils? Increasing/decreasing the share of untilled land? Please describe briefly the processes concerning changes of agricultural land use.

Not asked.

5. What are the main processes in the field of industry and technical infrastructure (new plants, industry centres, roads, railways etc.)? How would you assess its influence on land use?

There was an important decrease in the number of industrial plants in that subregion during the transformation period. Many large state industrial plants collapsed at that time – this also affected some tourist enterprises, which were directly related to large industrial companies.

6. What are the main processes in the field of tourism and services? Is there any development of tourism infrastructure (new hotels, holiday centres, swimming pools, tourist roads)? How intensive is the development in the spatial context (spatial extent of new areas used for tourism purposes etc.)?

Development of different forms of tourist activities. There are some isolated areas where the tourism has chances to develop (mainly mountainous part and a few settlements in the rest of the subregion).

7. How would you describe and summarize the general conditions of economy in your region and its impact on land use? Please refer also to employment issues.

The subregion is very active in promoting and marketing at fairs, meetings and conferences organized on regional or national level. There are many applications for the external funds, mainly from the European Union. In the region there is a relatively high level of unemployment. General socio-economic situation at a much lower level than the average in the Dolnośląskie Region.

II. Environmental issues

1. Could you describe the main changes of natural areas in the last five decades (changes of forested areas, biodiversity, water conditions)? Has the spatial extent and condition of areas of high nature value changed for the last five decades?

Previously that area had serious ecological problems – it was situated in the so-called Black Triangle. But now the situation has improved. There is much less air pollution, but the forest areas need a long time to regenerate their quality. Generally, that subregion has high environmental values – e.g. national and landscape parks.

2. Please assess the main contemporary and future threats for natural areas (especially protected areas) in the region. How are they related to land use changes?

Not asked.

3. Were there any natural disasters in the region in the last two decades which influenced the land use and land cover (floods, fires)?

Not asked

III. Multi-functionality

1. Please name socio-economic and environmental functions of land use in the region.
2. Multifunctional land use - which of the functions in your region co-exist?
3. Which of the functions are the most important in the context of land use?
4. Is the number of functions of land use increasing or decreasing?
5. To which extent is the land in your region used in multifunctional way?
6. What kind of functions co-existence is:
 - a) the most effective?
 - b) the most desirable?
 - c) the most common?
 - d) the most difficult?
7. Which of the functions of land use are the most important for the future regional development?

Definitely tourism is the dominating function in that subregion and therefore the development of this area should endeavour in this direction. The region has long industrial traditions (mining, breweries, other factories). There should be stimulation of the endogenous factors of development, but this subregion is located very peripherally, it is to some extent a problematic area, that is why the development is more challenging here. It is difficult from the perspective of a regional capital to show and decide what kind of functions will be developed there. Generally, in the regional strategy, the development of tourism function in that subregion is assumed. Because of the outmigration of young people, there is lack of young and active people who would stimulate the multifunctional development of that area. The problem of a small-scale multifunctional development is also related to poor accessibility of that subregion.

IV. Spatial conflicts

1. Are there any conflicts related to land use? (As space is limited different actors compete to obtain the possibly largest area or their needs. For example: inhabitants strive to build houses, a businessman wants to put a plant or warehouse, there is a need to build somewhere sewage plant, administration of protected area tries to enlarge the area and so on).

In the areas of high landscape quality, attractive to numerous functions, the spatial conflicts are common. Many functions and actors want to develop their own conception. High quality of environment leads to development of tourist functions. But there are conflicts of the tourism function with industry. Actually, there are conflicts on

such axis as: environment versus housing function, recreation and some kinds of tourism (skiing, quads).

2. What are the “competing” actors and functions (environmental, agricultural, industrial, settlement etc.)?

The most important role is in the hands of local government, a much lower role is played by the regional government.

3. Which of the actors are the most dynamic and successful in obtaining new land?

Not asked.

4. What are the most likely conflicts related to land use in future and what could be its impact on land use?

Not asked.

V. Government and policy

1. Please assess the state and regional law concerning spatial management and planning in your region. Are legal rules effective in sustainable and rational management of land?

There are some regulations (law and financial) on the regional level (e.g. way of transferring the European Union payments). These are however local initiatives and activities, what amount of external finance and which kind of initiatives will be running in the communes. So the local development results almost entirely from the activity of local leaders. Regional government is not responsible for that at a spatial level. Many of the activities on the local level depend on the cooperation of numerous municipalities (or communes with counties) possibly leading to implementation of common initiatives.

2. Is the local and regional administration effective in land management and in preventing and solving conflicts related to land use? (Please describe and assess the issue and give some examples. Summarize the role of local and regional administration in management of land use).

Regional government generally can support the development of parts of its territory, but it is the responsibility of the local government to utilize the endogenous potential and exogenous sources to the greatest extent. These local units need to have the initiative. The role of regional government in creation of new functions, changes in the spatial organization and land use is very limited. Of course, there is some general vision of development for the entire region, but it does not inhibit nor replace the local initiatives. For example there is some regional division of the European Union funds into the priorities, but that priorities were partly built upon the bottom-up initiatives and suggestions made by the local governments and local leaders and through the social consultancy. The local initiative is very important – because some rational decision made at a regional level does not always have to fit to the local conditions.

3. Is there any monitoring of land cover changes in the region? (Please describe briefly).

Certainly, there is a very detailed monitoring of the investments financed partly by the European Union – there are very detailed reports of results and taking care of the products within five years. There is a question if this period is enough or it should be longer. Such monitoring can be assumed as a part of spatial monitoring.

VI. Localization (depending on the region)

1. How land use changes are resulting from vicinity of state border (how the state border influences land use in your region)?

The region is located in the peripheries and it suffers from poor accessibility. Border is not an important factor of development or creating new functions. A significant aspect is the relief, which to some extent puts an impact on the possibilities of development.

VII. Land use in general

1. Please describe and summarize the major processes and trends of land use changes in the region over a last 50 years.

The Jeleniogórski subregion certainly has a great endogenous potential, if managed properly with a high activity of local government. That activity is the most crucial, the regional development is only possible with general support from higher administrative level.

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The ESPON 2013 Programme is part-financed by the European Regional Development Fund, the EU Member States and the Partner States Iceland, Liechtenstein, Norway and Switzerland. It shall support policy development in relation to the aim of territorial cohesion and a harmonious development of the European territory.

ISBN 978-2-919777-19-8