

Transformation of Rural Areas with High Urban Impact: the Example of the Largest Cities in the Warmia and Mazury Region

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Abstract. The paper discusses rural transformations resulting from urban influences. The analyzed area consists of rural municipalities (the smallest administrative units in Poland) in the immediate vicinity of Olsztyn, Elbląg and Elk – the largest cities in Warmia and Mazury. The type and rate of social and spatial changes in rural areas with high urban impact were analyzed. The following issues have been addressed:

- a comparison between demographic changes in rural municipalities neighboring on urban centres and demographic changes in the city,
- changes in the land use structure of rural municipalities neighboring on urban centers, with particular emphasis on open and protected spaces,
- architectural changes in the analyzed suburban areas,
- landscape changes in the analyzed suburban areas.

Keywords: region, rural areas, sub-urbanization.

Conference topic: sustainable urban development.

Introduction

Suburban zones are subject to constant transformations, whereas the most intense changes refer to the areas located in direct vicinity of administrative borders of cities. As a result of this process, a complex form of settlement is created: a city with back-up facilities functionally connected to it. As distance from the administrative borders of the city increases, the diversity and intensity of phenomena fades, along with functions and directions of development related to urbanizing processes. Thence, the suburban zone is primarily characterized by:

- occurrence of mixed forms of management (housing, agricultural, as well as leisure, transport, industrial and spa functions) and changes in the use of land which result from it;
- intensification of demographic processes;
- new architectural solutions in buildings (especially residential), which are different from historically shaped development;
- changes occurring in the classic landscape of rural areas causing its degradation.

The processes described above may be observed not only in the vicinity of large urban centers, but also around numerous cities of regional and local rank, including less developed cities in eastern Poland. Therefore, the objective of the article was analysis of changes in the external zone of the largest urban centers in the Warmia and Mazury Province. The basic unit of analysis was municipalities, forming a basis of the country’s administrative division. The performed study was aimed at ascertaining whether urbanization processes are of a universal character (the area of study is one of the weakest developed regions in Poland and the EU) or whether the size of an urban center influences the range of impact of such processes, as well as analysis and description of changes occurring in the above-listed four areas. The period of analyses encompasses the years 2007–2015, which was related to the availability of data in electronic form.

Changes in suburban areas

In the basic approach, suburbanization is determined as the migration of people from central areas of cities to the suburbs, and the core of such process are demographic changes (Brueckner 2000; Tammaru *et al.* 2009). The statistical dimension of this process is a drop in the population in the core city and an increase in the population of suburban areas (Lazauskaite *et al.* 2015; Raźniak, Nowotnik 2015; Flaga 2010; Jakóbczyk-Gryszkiewicz 2002; Węclawowicz

et al. 2010). Rural areas located within the area of impact of a city are primarily inhabited by people of working age and pre-working age, which increases the population growth and rejuvenation of human resources. The aim of such migration is primarily the enhancement of residential comfort – people with a lower economic status leave the cities in order to find cheaper, but larger residential areas, whereas people with a higher economic status look for better living conditions (substituting the hitherto place of residence in a typically urban environment with all its inconveniences for a higher quality rural environment) (Pichler-Milanovic et al. 2007; Harris, Larkham 2004). This translates to changes in spatial management, which are expressed in the development of constantly growing areas with a residential function (residential suburbanization); in turn, this is related to changes in the land use structure. As a result of urbanization pressure, the area of agricultural land decreases (arable land, meadows and pastures), along with forests, whereas urban forms of management are on the rise (Zborowski, Raźniak 2013; Brade et al. 2009; Pichler-Milanovic et al. 2007; Nechyba, Walsh 2004; Musiał-Malagó 2014; Tavares et al. 2012; Britz et al. 2011; Parysek 2008; Ponizy 2009; Knickel, Kok 2003; Rounsevell et al. 2006). The processes of these transformations, as a result of incorrectly pursued spatial policy (or its absence), have a dispersed character, whereas development is built in a chaotic and spontaneous manner. This is particularly dangerous for environmental and landscape assets, as the occurring changes result in irrevocable loss of their value (Goetzke 2014; Solarek 2013; Vos, Meekes 1999).

As a result of urbanization, the rural area of the region is changing rapidly. Suburban areas are settled by migrating residents of the region's capital. The traditional architecture of Warmian and Mazurian villages is replaced by modern forms of residential development, often destroying the harmonious spatial composition. New groups of residents disrupt the existing social structure in the villages of Warmia and Mazury.

The architectural tissue of Warmia and Mazury has not adopted industrial forms, which are the result of common industrialization. However, the traditional architecture manifested by clearly dominant sacral objects and subtle spatial structure of villages was destroyed by transforming existing facilities into recreational venues or agri-tourism farms, which have no relations to the local tradition. A characteristic and largely preserved architectural layout is a village with development located along the streets, in numerous cases transformed into an oval structure, located along roads connected at the entrance and at the exit. Further transformations related to dispersed development and establishment of more complex transport structures (access roads) have greatly disrupted the traditional and regional architectural layouts.

In the majority of cases, the processes described above are irreversible. The factors that in the initial stages of suburbanization determine its development (natural environment and landscape with significantly higher values than in the central area) become irrecoverably destroyed in the course of such a process, and the environment of the place of residence begins to resemble typically urban conditions.

Object of the study

The Warmia and Mazury Province is located in the northeastern part of Poland (see Fig. 1). It occupies an area of 2,417,347 hectares (where developed and urbanized land constitutes 92,728 hectares, including residential areas of 15%). The region is inhabited by 1,439,675 people; population density amounts to 60 people per square kilometer (the average value for Poland is 123 people per square kilometer). In the Warmia and Mazury Province, there are 49 urban centers, whose population makes up 59.07% of the population in total. The largest urban centers are Olsztyn (capital of the province) and Elbląg; at the same time, these are the only centers where the number of residents exceeds 100,000 (173,444 and 121,642 people, respectively). One urban center, Elk, has the number of people exceeding 60,000 (60,462 people), and 21 centers are within the range of 10,000–30,000 people (based on the Local Data Bank of the Central Statistical Office).

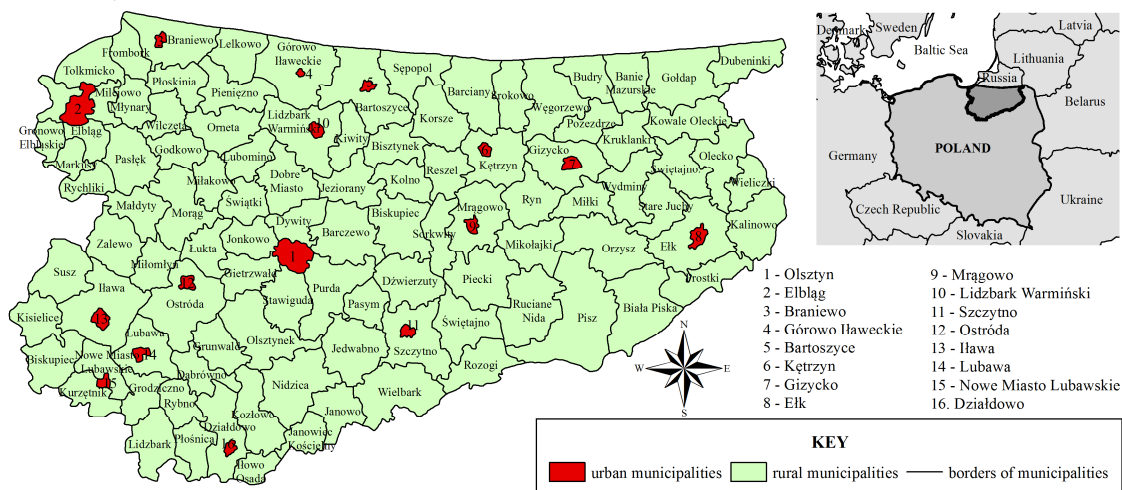


Fig. 1. Study area location (Source: Authors' own elaboration)

Study methods

Data from the Central Statistical Office and the Province Center of Geodetic and Cartographic Documentation in Olsztyn was used to analyze the demographic changes, changes in the use of developed and urbanized land, changes in residential areas and changes in afforestation and protected sites. A map of the province divided into basic units (municipalities) was procured from the State Register of Borders, made available by the Center of Geodetic and Cartographic Documentation.

The results of analyzed phenomena are presented with the use of cartograms. The rate of changes was compared with the value of 100% (denoting no changes). All cartograms were divided into five sections. On account of the variety of the analyzed phenomena, a division into various intervals was made, depending on the spread of the obtained results. A value above 100% means an increase in value, whereas a value below 100% means its decrease.

Landscape and architectural changes were the object of field studies, as a result of which photographic documentation was prepared, presenting the changes occurring in the form and types of development. Selected photos presenting the suburban areas are included in the study.

Results

Figure 2 presents the rate of changes in population density in the municipalities of the examined province between 2007 and 2015. A significant regular increase in the number of people per 1 square kilometer was recorded around the largest discussed urban centers – Olsztyn, Elbląg and Ełk. A similar tendency was noted in Szczytno, where the largest drop in the urban population in the scale of the region was accompanied by the largest increase in the population in neighboring rural areas. This is a typical situation within the entire analyzed province. Furthermore, decreasing tendencies may be observed within the administrative borders of Olsztyn and Elbląg, which is related to the flow of city dwellers to suburban areas.

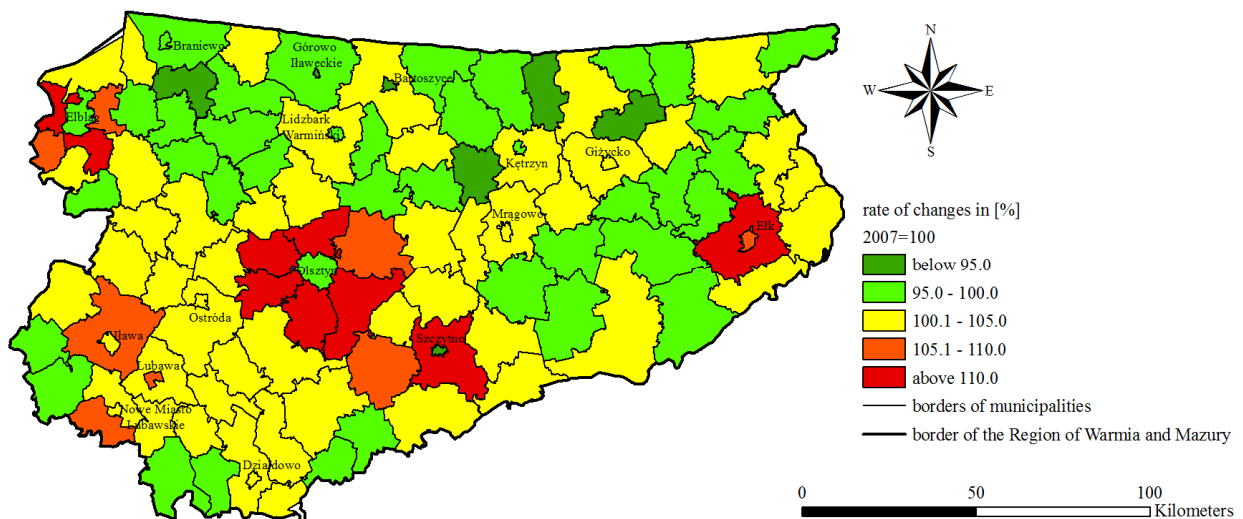


Fig. 2. Rate of changes in population density in the municipalities of the Warmia and Mazury Province between 2007 and 2015 (Source: Authors' own elaboration)

The phenomenon presented in Figure 2 is confirmed by the results presented in Figure 3. In the examined period, the number of people who changed their registered address from the city to a rural area and people who left the city shows analogous tendencies in the analyzed years. This is confirmed by the persevering scale of internal migration in the region.

Figure 4 presents the rate of changes in developed and urbanized land. Around the capital of the province, Olsztyn, growth is definitely highest. It is slightly lower in Elbląg, which may result from the loss of administrative functions after the reform of 1999, as a result of which the city forfeited the function of the capital of the contemporary Elbląg Province. In the case of Ełk, the low index primarily results from the neighborhood of the city (with powiat rights): it is surrounded by a single administrative unit – the rural municipality of Ełk. Problems with procurement of land for development within the direct vicinity of Ełk resulted in the fact that this city has one of the highest population indices in the country and the highest in the Warmia and Mazury Province. In the western part of the province, a belt of municipalities stands out with the highest growth index of developed and urbanized land, which results from the course of the major thoroughfare in the region – express road S7.

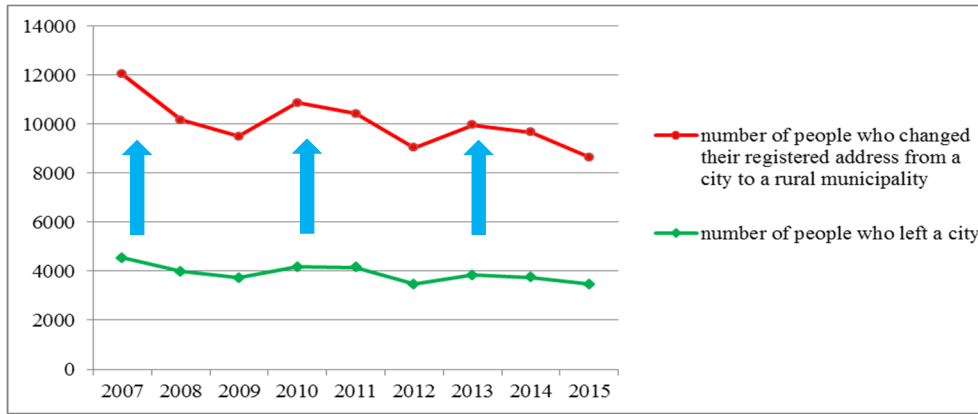


Fig. 3. People who changed their registered address from a city to a rural area, and people who left a city between 2007 and 2015 (Source: Authors' own elaboration)

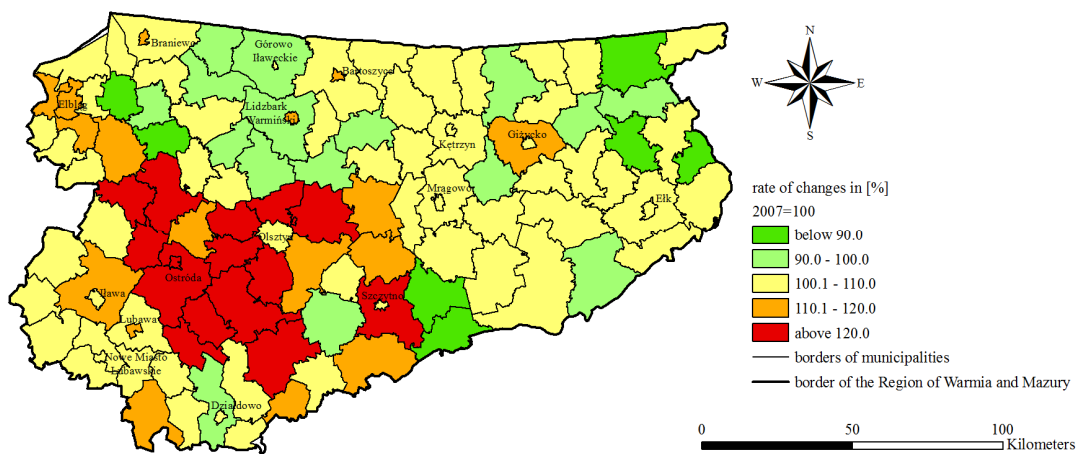


Fig. 4. Rate of changes in the area of developed and urbanized land in the municipalities of the Warmia and Mazury Province between 2007 and 2015 (Source: Authors' own elaboration)

Figure 5 clearly confirms the position of Olsztyn as the leading urban center in the region. A very high growth of residential areas was ascertained, making up a ring around the capital of the region. Olsztyn, together with the western municipalities of Ostróda, Iława and Lubawa, make up the axis of development for residential functions and the service functions accompanying it. High values were also noted in the vicinity of Elk and Szczętyno. Only the neighborhood of Elbląg shows varied tendencies, with a dominance of growth.

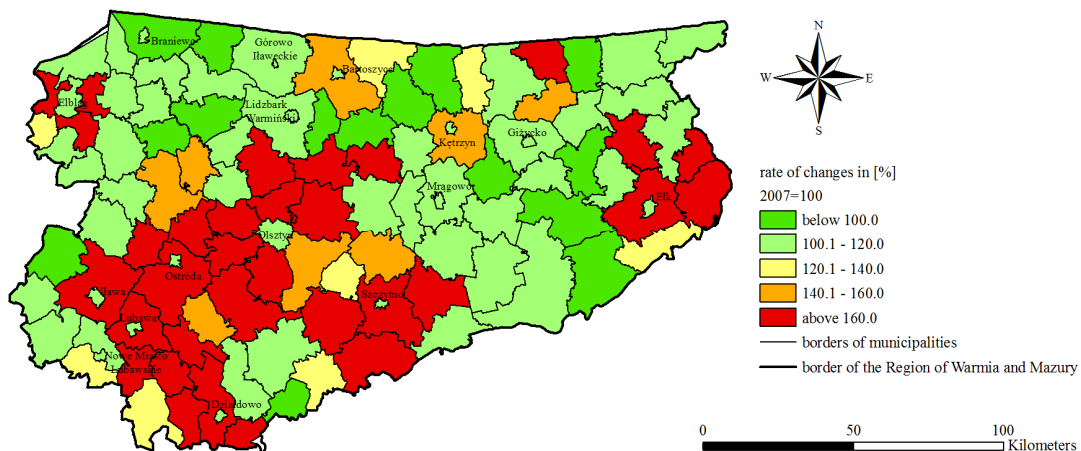


Fig. 5. Rate of changes in residential areas in the municipalities of the Warmia and Mazury Province between 2007 and 2015 (Source: Authors' own elaboration)

The observations above are confirmed by the analysis of changes in forest areas (see Fig. 6). Around the three main urban centers, no major growth was recorded, only growth tendencies. This is definitely the aftermath of consistent implementation of the National Program of Increasing Forest Cover, which assumes an increase in the country's forest cover up to 30% by 2020 and up to 33% after 2050. The expansion of urban development and demographic changes prevent significant expansion of forest areas, in spite of the domination of soil with slight agricultural utility. The vicinity of Elbląg is the only area where it is possible to observe slight divergences from the ascertained regularities.

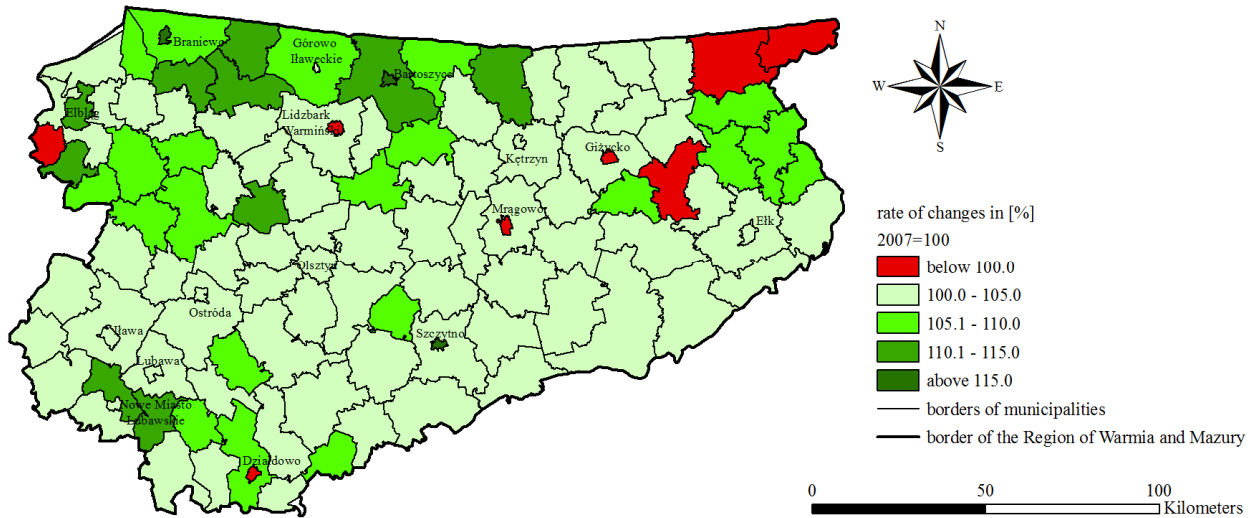


Fig. 6. Rate of changes in forest cover in the municipalities of the Warmia and Mazury Province between 2007 and 2015 (Source: Authors' own elaboration)

When analyzing changes in the area of protected sites (see Fig. 7), no regularities were ascertained for the leading urban centers. It is worth noting that a growth tendency is observed in this respect around Olsztyn, which does not pose a barrier for development of developed and urbanized areas and, in particular, residential areas (see Fig. 4 and Fig. 5). This testifies to the fact that it is possible to reconcile urban processes with protection of environmental assets. Within the direct vicinity of Elbląg, tendencies are diverse: from negative, through no changes, up to slight growth tendencies. Such diversity around this urban center may result from the higher level of industrialization of this part of the region and direct access to the Vistula Lagoon, generating a greater number of functions and elements of spatial management.

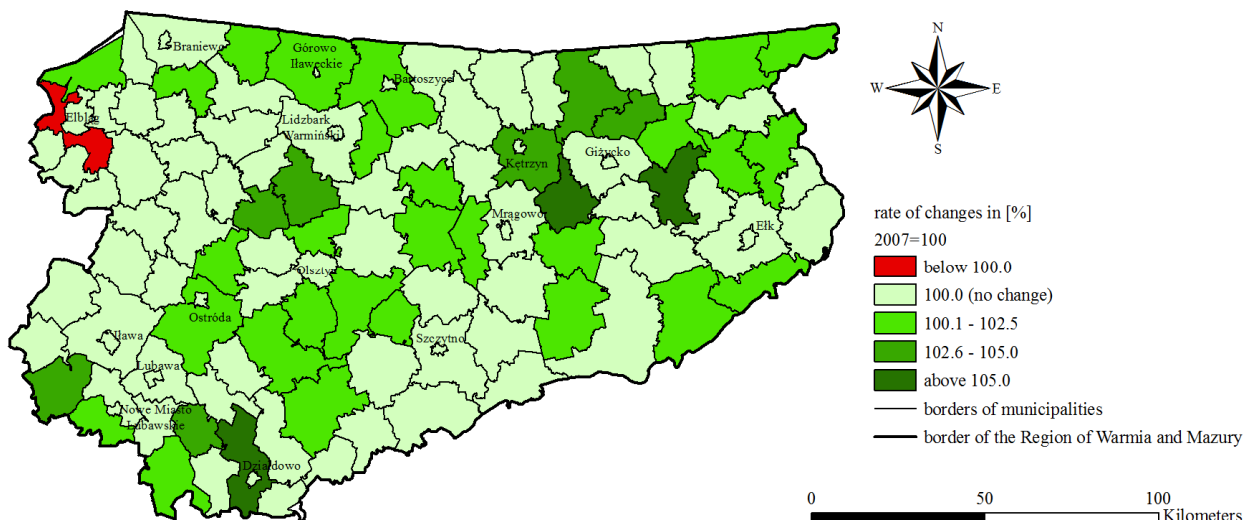


Fig. 7. Rate of changes in protected sites in the municipalities of the Warmia and Mazury Province between 2007 and 2015 (Source: Authors' own elaboration)

Changes in the landscape and architecture of suburban areas are shown in the photographs below. Traditional development is single-family houses and farm buildings made of red brick (see Fig. 8) or wood (see Fig. 9) covered with gabled roofs with tiles, also red.



Fig. 8. Traditional brick residential development in Warmia and Mazury (Source: Authors' own elaboration)



Fig. 9. Traditional wooden residential development in Warmia and Mazury (Source: Authors' own elaboration)

New single-family development follows modern architectural solutions (in different colors), which often completely mismatches the surroundings (see Fig. 10 and Fig. 11 show adjoining facilities). This causes aggravating disparities in the landscape and intensifies the perceptible spatial chaos, which is also magnified by the progressing disorder of development, emerging in a disorganized manner, without clearly determined spatial frames.

Adverse and uncontrolled changes are additionally aggravated by multi-family development emerging at the border of the city and villages (see Fig. 12), which devastates the typically rural landscape.



Fig 10. Modern residential development in Warmia and Mazury – construction stage (Source: Authors' own elaboration)



Fig. 11. Modern residential development in Warmia and Mazury (Source: Authors' own elaboration)



Fig. 12. Suburban landscape of Olsztyn (Source: Authors' own elaboration)

Conclusions

The region of Warmia and Mazury is characterized by a quite low level of urbanization. Three cities, Olsztyn, Elbląg and Elk, took over the functions of growth centers. Socio-economic changes are the source of landscape and architectural transformations. However, in the vicinity of the three analyzed cities, the urbanization processes are of varied intensity. The size of such transformations is determined by the size of the urban center and its significance in the administration system. The range and the scale of impact of the largest city are definitely greater than in the case of the two others. This creates a space for the uncontrolled and irreversible effects of suburbanization processes on multiple areas. The conducted study confirms the occurrence of mixed forms of management and intensification of demographic processes. The result is a necessity to introduce new architectural solutions influencing the emergence of development varying from traditional and regional buildings. Progressing suburbanization in the vicinity of large cities results in transformations of the landscape and diversification of its forms in various parts of the region. This influences the lack of uniformity of space and loss of its individual regional values, along with progressing degradation of the landscape in rural areas.

Between 2007 and 2015, the main center of changes in the Warmia and Mazury Province was the capital of the region, Olsztyn. On account of its functions, location and size, the fastest rate of analyzed changes was recorded there, influencing the transformations in the surrounding areas. In the case of Elk, certain factors are determined by the city's adverse location in the region, but also the fact that the city is surrounded by a single administrative unit. In the case of Elbląg, the convergence of individual results is impaired by the city's loss of the regional center function. Simultaneously, this part of the province is characterized by the highest level of development of industrial and service functions.

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