

NATURAL-LANDSCAPE VALUES AND SETTLEMENT TENDENCIES IN SUBURBAN AREAS ON THE EXAMPLE OF SELECTED MUNICIPALITIES IN THE VICINITY OF LUBLIN

Joanna Sender

Department of Landscape Ecology and Nature Conservation, University of Life Sciences in Lublin
Dobrzańskiego str. 37, 20-262 Lublin, joanna.sender@up.lublin.pl

Summary. The analysis of the settlement development was conducted in two suburban communes of the province of Lublin: Jastków and Strzyżewice. The aim of the work was qualification of the pace of suburbanisation processes and estimation of natural landscape values of selected districts. The investigations covered the period from 1995 to 2009. Both Jastków and Strzyżewice communes have been areas of intensive settlement development for several years. First of all, it is connected with their situation in the neighbourhood of Lublin. Changes in commune development are observed in both communes under investigation. The increasing population is one of the effects of the suburbanisation process in the communes. Both Jastków and Strzyżewice communes have many natural and landscape values. The most important of them are legally protected areas and cultural monuments under conservation. High quality of natural environment can be an impulse for development of recreation and weekend tourism.

Key words: settlement development, suburban areas, synthetic index of environmental burden, suburbanisation

INTRODUCTION

Settlement is the process of occupying, division and usage of the terrain by every kind of human activity which causes changes in the geographical environment [Woźniak 1970]. The settlement is connected directly with the urbanisation process. Urbanisation consists in growth of the number of towns and cities and in increase of the total size of the municipal populations [Malisz 1981]. In reality, urbanisation is a multi-aspect phenomenon [Ziółkowski 1965]. Particular stages of changes in the development of colonial entities allow to distinguish several stages of this process: urbanisation, suburbanisation and out-urbanization. The most

dynamic process is that of suburbanisation, that is the continued growth of the number of inhabitants, especially in the external zones of cities [Domański 2000].

Suburbanisation often appears to be a chaotic expansion of the suburban zone, including areas administratively belonging to villages, and involves the extension of technical infrastructure, concentration of buildings around cities and the related service centres.

The quick growth of terrains occupied by the city is the principal change in the space. The border between city and village is not perceptible and it often serves only an administrative function. Growth of population earnings, reduction of costs of journey to work, unfavourable phenomena related with living city centres, the migration of employers, as well as policy are the main factors of suburbanisation process [Słodczyk 2001].

The development of settlement is determined by two kinds of factors: physical-geographical (land relief, climate, kind of the soil, access to water, vegetation cover), and socio-economical [Matyjaszkiewicz and Putkowski 1971].

According to the Nature Conservation act [Decree... 2004], landscape values comprise ecological, aesthetic or cultural qualities of an area and the related with them: lie of the land, nature creatures and components created by nature or human activity [Beard and Macias 2007].

At present there is an intensive suburbanisation process in the urbanised areas in Poland. This phenomenon is also observed in the Lublin conurbation. The suburban zone comes into being as an area inhabited by people who moved out of the city. The main reason of such phenomenon is common aversion to living in blocks or in districts with very dense building.

The suburban zones are the most attractive for the population. The analysed communes are characterised by high natural values. Moreover, on account of their closeness to Lublin, they are particularly important for tourist and recreational usage.

The aim of the work was qualification of the pace of suburbanisation processes and estimation of natural landscape values of selected communes, as well as determination of the overload degree of the natural environment of the communes studied.

STUDY AREA AND METHODS

The analysis of settlement development was conducted in two suburban communes of the province of Lublin – Jastków and Strzyżewice, situated in the central part of the Lublin Voivodeship.

The investigations covered the period from 1995 to 2009, because during that time the suburbanisation processes proceeded the most intensively and that tendency had an essential influence on changes in the development plan for the communes studied.

Lublin is regarded as the most important urban area in the eastern part of Poland according to the concept of country development plan which came into being in 2001.

There are a lot of services and financial capital in this city. It is the urban centre of a forming agglomeration, with over 500 thousand inhabitants. The net of the main towns of the agglomeration creates the form of a hexagon, where Lublin and Świdnik make up the centre and the satellite centres are Łęczna, Piaski, Bychawa, Bełżyce and Lubartów. Kurów complements this net and, together with Markuszów and Garbów, create places of colonisation along national road No. 17 (Fig. 1).

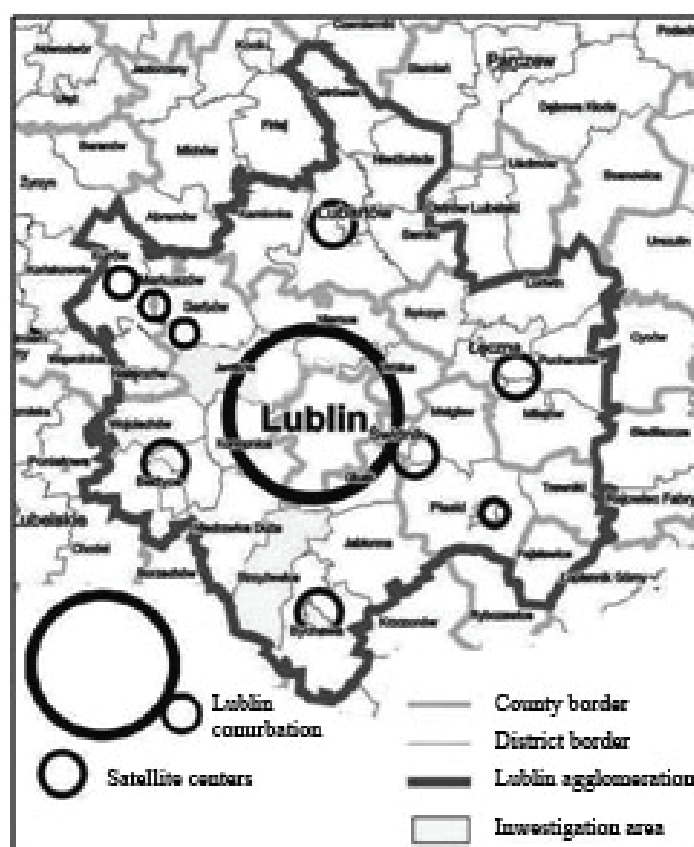


Fig. 1. Location of Jastków and Strzyżewice rural communes in the Lublin agglomeration (acc. to the Lublin Voivodeship development plan, 2002)

First of all, communes Jastków and Strzyżewice serve the Lublin agglomeration as a housing base. They also have the possibility of attracting investment because of the closeness to the city centre. These communes are also the place of food production for inhabitants of Lublin which is the market not only for agricultural products but also for those of the local industry and craft. Jastków and Strzyżewice are located in intensive agriculture and gardening zones, where

mainly vegetables, fruit and milk are produced. There are many fruit orchards and greenhouses here (Tab. 1).

Table 1. Land use in communes Jastków and Strzyżewice [acc. Statistical Yearbook... 2005]

	Total area, ha	Land under agricultural use, %			Forest land, %	Idle land and others, %
		total	arable land	grass- land		
Lublin voivodeship	2 511 448	62.8	49.9	12.9	22.5	14.4
Lublin district	167 942	73.5	67.1	6.4	9.8	16.7
Strzyżewice commune	10 884	75.8	69.2	6.6	14.2	10
Jastków commune	11 376	88.6	80.2	8.4	4.8	6.6

The analysed communes are characterised by unusually rich history [Rymarz 1994] and also by high natural and landscape values. The Czerniejowski Protected Landscape Area in the north-east part of Strzyżewice commune covers 28% of its total area. This Protected Landscape area consists mainly of forests, river valleys and terrains with varied land relief. About 1000 species of vascular plants occur there, among them a lot of protected species [Samborska 2006].

The eastern part of the Jastków commune was included in the Ciemięga River Valley Protected Landscape Area in 1990. The surface area of this protected area – 2627 ha – makes up 9.7% of the commune area. This Protected Landscape area includes the central (from Jastków downstream) and the lower sections of the river valley, together with their surroundings – ravines and dry valleys on the valley slopes. In the Protected Landscape Areas it is forbidden to localize any building at a distance of 100 m from the banks of any rivers, lakes and other water reservoirs [Decree... 2004].

There are also a lot of cultural objects and places with high values among them: palace and park complexes, churches and shrines .

The analyses were conducted using study and field investigations methods. Source materials were collected on the basis of literature analysis, cartographical and statistical sources, and also field works. Interviews were also conducted with employees of Strzyżewice and Jastków Municipal Council.

In order to calculate the influence of human activity on the natural environment, the synthetic index of the environmental burden (SWOŚ) was determined [Chmielewski 2001].

$$SWOŚ_j = \frac{1}{8} \sum_{i=1}^8 P_{ij}$$

where:

SWOŚ_j – synthetic index of environmental burden in district *j*.

RESULTS AND DISCUSSION

For several years the Jastków and Strzyżewice communes have been areas of intensive settlement development. First of all, this is connected with the situation of the communes in the neighbourhood of Lublin. Changes in commune development are observed in both of the investigated communes. The increasing population is one of the effects of suburbanisation processes in these communes. In Jastków the increase was considerable, at about 23.07%, however, in the whole commune of Strzyżewice district the population diminished by about 1.35%.

According to data from 31 December 2009, Strzyżewice commune was inhabited by 7404 people, while the population of Jastków was 12 897 inhabitants. The number of inhabitants was constantly increasing during the investigated period. This tendency is the effect of migration (as a consequence of the suburbanisation process) (Fig. 2).

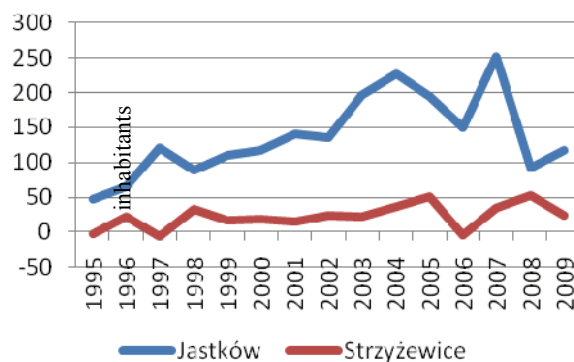


Fig. 2. Balance of internal and international migration in the Strzyżewice and Jastków communes in 1995–2009 (acc. to GUS, BDR)

The Population Density Index in particular villages of both investigated communes was differentiated.

In Jastków commune the average density of population was 114 inhabitants per km². The most densely populated single villages were those near the boundaries of Lublin: Barak (374.4 inh./km²) and Marysin (256.4 inh./km²), while under-populated villages were found in the western part of the commune: Colony Moszna and Moszenki, with population densities of 31.2 and 41.2 inhabitants per km², respectively (Fig. 3).

In Strzyżewice commune the average density of population was 68 inh./km². The most densely populated village was Piotrowice (120.7 inh./km²), situated in the central part of the commune, near the main communication axis – the province road. The most underpopulated villages were Borkowizna (36.8 inh./km²), Pawłówek (37.5 inh./km²), Colony Kiełczewice Dolne (38.7 inh./km²) and Dębszczyzna (47.6 inh./km²) (Fig. 4). They are located away from the main town and routes, in the extreme position towards Lublin.

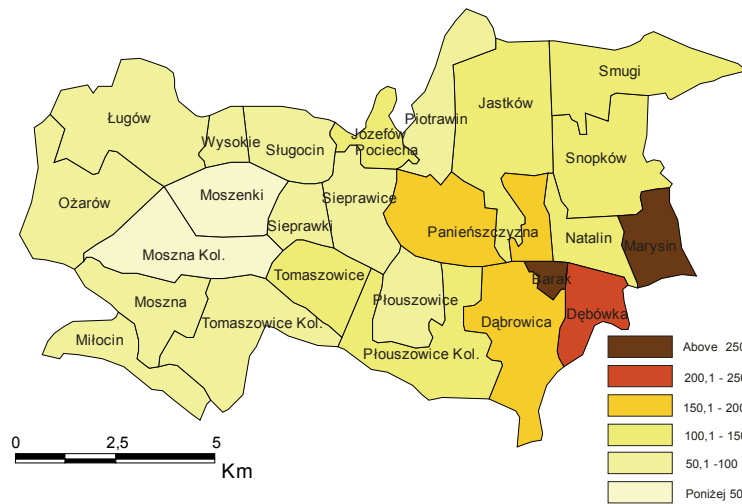


Fig. 3. Density of population in particular villages in Jastków district (inh./km²) (acc. to USC Jastków)

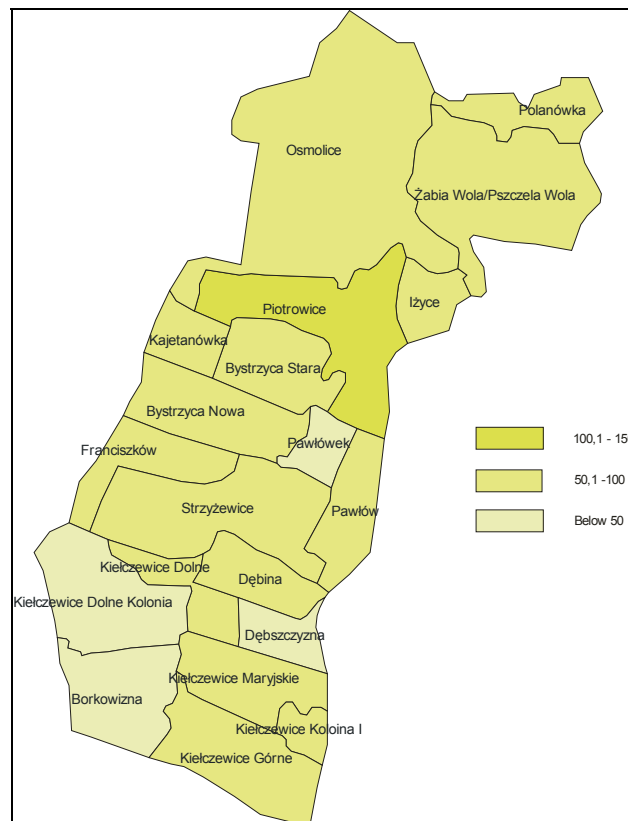


Fig. 4. Density of population in particular villages in Strzyżewice commune (inh./km²) (acc. to USC Strzyżewice)

Another effect of the suburbanisation process in the suburban communes of Lublin was an increase in the number of dwellings. Since 1995 the housing stock in Jastków commune gradually increased. In 1995 there were 2648 houses, while in 2008 already 3623. However, in Strzyżewice commune this process was much slower. In 1995 there were 2118 dwellings, and in 2008 – 2301 (Fig. 5).

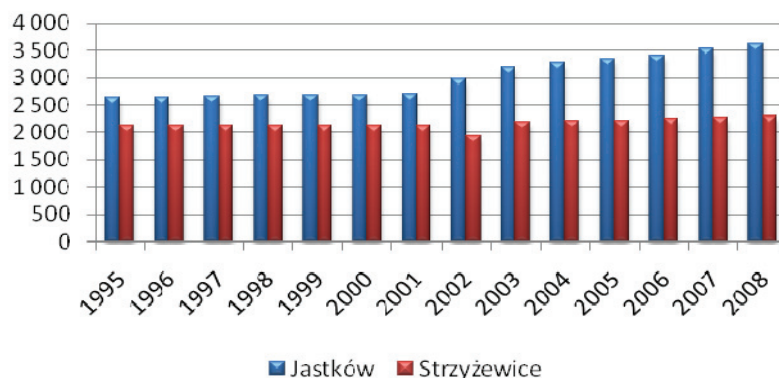


Fig. 5. Number of houses in Strzyżewice and Jastków communes in 1995–2008 (acc. to GUS, BDR)

The number of building permits translates into construction activity. Between 1995 and 2005, about 945 permits were issued in Jastków commune. The greatest number of permits was issued in 1999, although the first violent increase occurred in 1996. In Strzyżewice commune 362 permits were issued in the period from 1995 to 2005, and mostly in 1999 (48) (Fig. 6).

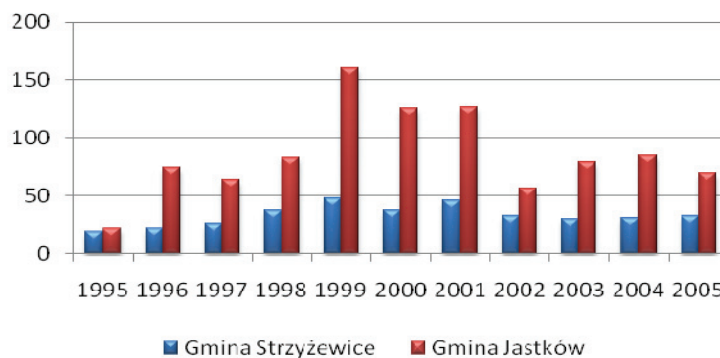


Fig. 6. Numbers of building permits issued in the Jastków and Strzyżewice communes in 1995–2005 (acc. to UG Jastków and Strzyżewice)

The number of permits issued was different in each single village (Fig. 7). Single-family housing is growing in areas with good access to technical infrastructure, convenient communication and close proximity to the centre of the agglomeration. Axes of significant building activities are the circulation routes: National Road No. 17 and provincial roads No. 809 and 830.

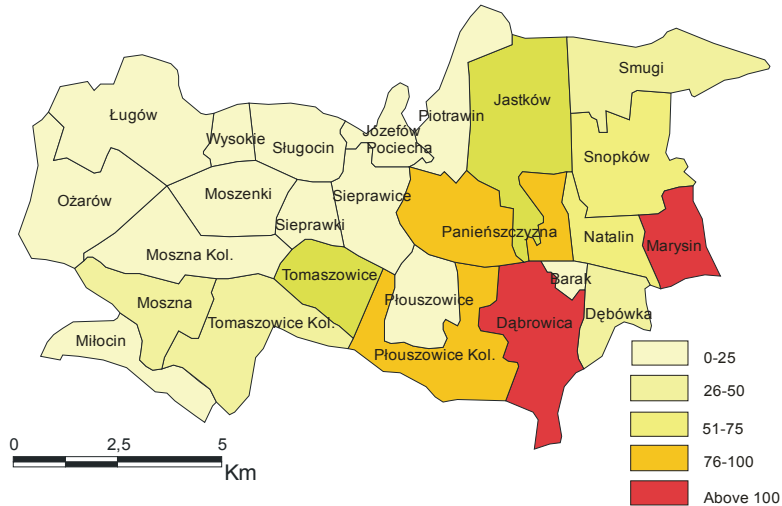


Fig. 7. Numbers of building permits issued in particular villages in the Jastków commune in 1995–2005 (acc. to UG Jastków)

In the period under analysis, in the Strzyżewice commune the most building permits were issued in village Żabia Wola (76 licenses). The village is very well equipped with technical and social infrastructure, and furthermore it is situated in the northern part of the commune, close to the administrative borders of Lublin. Large numbers of permits were issued in villages in the immediate vicinity of the city (the northern part of the municipality) and having a good connection with Lublin. The least permits were issued in villages far away from Lublin, situated far from the main axes of communication, poorly equipped with technical infrastructure and under agricultural use (Fig. 8).

There was a correlation between the distance from Lublin to a village and the time in which the greatest number of building permits were issued. The most intensive building activity was the earliest in villages located closer to Lublin, and later in villages situated further away from the urban centre of Lublin. This is a typical example of the phenomenon of suburbanisation. New housing construction in rural areas involves mostly typical single family houses in areas which were previously used for agricultural purposes (Fig. 9).

Uncontrolled and haphazard development of housing poses a threat not only to the environment but also to landscape aesthetics. Housing estates in peri-urban areas are often characterised by a large arbitrariness in physiognomy and a lack of aesthetic order. Houses are often built in different architectural styles, have different numbers of storeys, and thus differ from other houses in the area (Fig. 9). Building activity develops mainly along roads. Currently the roads are systematically equipped with hardened surface and municipal infrastructure.

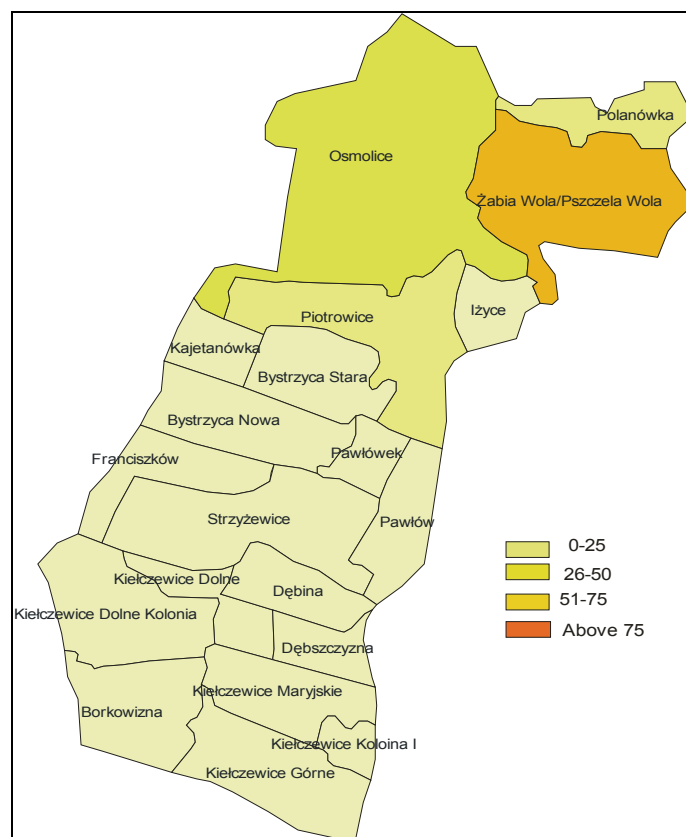


Fig. 8. Numbers of building permits issued in particular villages in the Strzyżewice district in 1995–2005 (acc. to UG Strzyżewice)



Fig. 9. Housing estate in the village of Marysin (Photo: K. Nowakowska)

mediate vicinity of river valleys, introduction of anti-erosion afforestation, prohibition on conversion of agricultural land in areas with different functions, consolidation of links between natural elements for biodiversity of development of the communes.

Local development plans also identify the principles for the spatial development of protected areas and their surroundings. These include: protection and preservation of existing historical elements, preservation of divisions in parcels shaped in the past, no new building (except for reconstruction of historical buildings), no changes in the spatial structure, providing optimal exposure of historical buildings, ban on construction in the neighbourhood of facilities with a scaled volume which interfere with functions of vistas, no changes in topography and composition of green land belonging to protected zones.

The communes Strzyżewice and Jastków have developed directions of spatial development in order to enhance the effectiveness of their activities in the development and shaping of spatial order, as well as in rational use of space and environment.

An important thing is to balance the spatial development of the communes [Kozłowski 1999]. According to the definition of sustainable spatial development the main objective of management in the area should be to strive for multifunctionality. It is also essential that the diversity of functions may lead to conflicts between different destinies of the site but could also have a negative impact on the environment. Within the communes the following features should be developed: residential, agricultural, service, tourism and recreation, and industrial production. Local authorities may not be subject to pressure from the residents and investors regarding changes in the function and purpose of a site, but they should consistently pursue a policy which was set out in the spatial planning documents.

In connection with the preferred location in the vicinity of large city districts, the dominant function is housing development. However, it should primarily rely on compacting existing buildings. It is unacceptable to determine new construction areas in places susceptible to other functions, especially with high natural and landscape values. Housing development should rely primarily on extensive conversion of farm building in the type of family housing, where space is used more intensively. Constant fragmentation of settlement should be inhibited by the creation of small housing, involving single-family houses along roads. These areas should be equipped with technical infrastructure and well connected with major roads, as this will encourage potential residents to settle in these areas. Building sites should not be determined along main roads, because it could create the threat of the formation of belt-shaped built-up areas and their continuous scattering. Furthermore, it is necessary to establish rules relating the appearance of buildings, such as roof shape, height, location of a parcel and existing building line. This will contribute to maintaining the aesthetic order.

Both Jastków and Strzyżewice communes have many natural and landscape values. The most important of them are legally protected areas and cultural

monuments under conservation. These valuable for communities values may be threatened by several factors that include the presence of transit routes passing through the area of the communes and the lack of proper care for historical buildings. It seems that the biggest threat is population pressure on the neighbouring settlement of the city.

Settlement processes have an impact on the environment which is a valuable part of both communities (Tab. 2).

Table 2. Synthetic index of environmental burden (SWOŚ) in communes of Lublin district

Commune	SWOŚ
Bełżyce	2.94
Borzechów	1.35
Bychawa	4.29
Garbów	4.92
Głusk	4.15
Jabłonna	2.24
Jastków	3.61
Konopnica	4.55
Krzczonów	1.48
Niedrzwica Duża	3.07
Niemce	4.18
Strzyżewice	2.72
Wojciechów	0.98
Wólka	6.20
Wysokie	1.52
Zakrzew	Reference district
District of Lublin	3.08

In the district of Lublin, communes which are the most vulnerable to environmental degradation are Garbów and Wólka, while Borzechów and Wojciechów are the least vulnerable. The SWOŚ index in the analysed communes reached values similar to the average for the entire district (Tab. 2).

Changes in the values of the SWOŚ index in 2000–2009, particularly a sharp decline in 2004, were due to increase in the length of an active water supply system and reduction in water consumption. Recently, the SWOŚ index was subject to slightly fluctuations in the Jastków and Strzyżewice communes. The values were higher than the rate for the entire district, and only in the final year of the analyses year the SWOŚ index value for the Strzyżewice commune fell below the value for the district (Tab. 3).

Table 3. Synthetic index of environmental burden (SWOŚ) in the communes of Strzyżewice and Jastków and the district of Lublin in the years 2000–2009

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
SWOŚ Jastków	37.73	36.24	32.73	42.00	4.40	3.99	3.63	3.41	3.65	3.61
SWOŚ Strzyżewice	31.77	30.30	30.00	40.24	6.22	4.04	3.0	4.00	4.02	2.72
SWOŚ Lublin district	30.16	28.17	27.15	34.06	4.09	3.48	2.94	3.17	3.16	3.08

CONCLUSIONS

On account of the high natural values of the analysed communes, the local authorities should carry out such policies as much as possible to minimise the negative impact of land use on the environment. A big threat is the designation of new, often unique natural areas for housing development.

High quality of natural environment can be an impulse for the development of recreation and weekend tourism. However, this depends on expansion of tourism infrastructure (designation and appropriate marking of hiking trails, bicycle paths, and accommodation).

The situation of the communes in the vicinity of Lublin causes that the process of suburbanisation becomes a very conspicuous phenomenon. Impetuous spreading of buildings is greater in Jastków than in the Strzyżewice commune. The analysed districts have a space policy through arrangements entered in various types of documents, including the zoning plan. They determine the purpose of individual grounds and detailed rules for their management and use.

The overriding principle of commune development set out in those documents is long-lasting balanced and sustainable development and preservation of spatial order, taking into account the lowest negative impact on natural features of landscape.

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WALORY PRZYRODNICZO-KRAJOBRAZOWE A TENDENCJE ROZWOJOWE
OSADNICTWA NA TERENACH PODMIEJSKICH NA PRZYKŁADZIE WYBRANYCH
GMIN POWIATU LUBELSKIEGO

Streszczenie. Analizę rozwoju osadnictwa przeprowadzono w dwóch gminach podmiejskich województwa lubelskiego: Jastków i Strzyżewice. Celem pracy było określenie tempa rozwoju osadnictwa w gminach narażonych na intensywne procesy suburbanizacyjne oraz waloryzacja przyrodniczo-krajobrazowa, polegająca na wskazaniu szczególnie cennych elementów środowiska przyrodniczego oraz kulturowego. Zakres czasowy badań obejmował okres od 1995 do 2009 r. Zarówno gmina Jastków, jak i Strzyżewice od kilku lat są obszarami intensywnego rozwoju osadnictwa. Jest to związane przede wszystkim z położeniem w sąsiedztwie Lublina. Jednym z efektów tego procesu jest zwiększająca się liczba ludności w gminach podmiejskich. Innym efektem procesu suburbanizacji w gminach podmiejskich Lublina jest wzrost liczby mieszkań. Niekontrolowany i chaotyczny rozwój zabudowy mieszkaniowej stwarza zagrożenie nie tylko dla środowiska przyrodniczego, ale także dla estetyki krajobrazu. Zarówno gmina Jastków, jak i gmina Strzyżewice mają liczne walory przyrodnicze i krajobrazowe. Do najważniejszych z nich należą obszary prawnie chronione, a także zabytki kultury objęte ochroną konserwatorską. Wysoka jakość środowiska przyrodniczego może być impulsem do rozwoju rekreacji i turystyki, zwłaszcza weekendowej.

Słowa kluczowe: rozwój osadnictwa, tereny podmiejskie, syntetyczny wskaźnik obciążenia środowiska, procesy suburbanizacyjne