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Anna SIKORA[1]

CHARCTERISTICS OF NEW BUILDINGS IN THE IMPACT AREA OF A LARGE CITY

The existence of many field estates, despite their apparent order, from the landscape point of view is chaotic, incoherent and inefficient in terms of communication.
The article attempts to create a typology of the most characteristic layouts of housing estates and to indicate the main factors influencing the formation of building complexes. The subject of the study is the analysis of the specificity of the spatial development of suburban zones in three cities: Rzeszów, Poznań and Warsaw. The aim of the analysis is to show the similarities and differences in selected areas. The implementation effect is the recognition of the nature of the buildings spreading outside the city's territory.
Determining the typology of buildings that can be located in specific areas may also help in practice of issuing decisions on development conditions. The catalogue of possible solutions, together with the analysis of the produced communication systems, will allow to forecast the spatial shape of future investments and, consequently, to optimize the provisions limiting pathological solutions.

Keywords: typology, suburbanization, peripheries, housing estate

1. Introduction

Areas in the vicinity of a large city are subject to strong investment pressure. It influences the function, type and nature of buildings in its zone of influence [1]. It can be seen that the spatial transformation processes in cities and their surroundings have intensified in recent years [2]. Actions related to the growth of the population and building area along with territorial expansion are called spatial urbanization. It is one of the subtypes of the multidimensional concept of urbanization [3]. The development of cities and suburban areas takes place at the expense of reducing the area of natural and semi-natural areas. Uncontrolled urbanization deteriorates the quality of life of city users [4] and rural areas, including those with high natural and landscape values [5]. It is especially visible in areas without spatial planning. The intensity of coverage with local spatial development plans (LSDP) depends on the adopted building development policy. There are cities mostly covered with planning documents

[1] Corresponding author: Anna Sikora, Rzeszow University of Technology, The Faculty of Civil and Environmental Engineering and Architecture, ul. Poznańska 2, 35-959 Rzeszów, sikora@prz.edu.pl, orcid: 0000-0002-3646-6924

which precisely define the purpose and method of land development [6], in other settlement units the plans are replaced with point administrative decisions: decisions on building conditions and land development [7]. Such spatial policy is conducive to the formation of chaos and spatial disorder [8].

The peripheral urban areas and those located just outside the administrative border of the city are exposed to negative suburbanization and urbanization processes [9, 10]. It is worth noting that the spatial nature of suburbanization differs depending on the region or country [11]. In Poland, it has a point dimension. Micro-estates are a frequent spatial phenomenon, where the urban form is determined by the morphology of one or more plots of land intended for development. Due to the nature of the fields of agricultural land, meadows and pastures, the plots are narrow and long (meadows), and they are situated perpendicular to the roads [12]. Such spatial conditions give rise to the so-called field buildings [13]. The importance of field development for the proper development of territorial strategies and policies [14] is presented in numerous analyses, including the report of the Supreme Audit Office: System of managing the municipality's space as a public good [15].

2. Methods

The subject of the study is the analysis of the specificity of the spatial development of suburban zones in three cities: Rzeszów, Poznań and Warsaw. After defining the territorial area of the research, a cartographic analysis of the extent of the invested areas in the area of influence of large cities was carried out. An orthophotomap was used for the analyses. Another element of the research was to distinguish the areas of characteristic field development and to analyse their morphology. Three sites were selected for the comparative analysis.

The aim of the analysis is to show the similarities and differences in selected areas. The implementation effect is the recognition of the nature of the buildings spreading outside the city's territory. Particular attention was paid to the field buildings. The conducted analyses may affect the arrangements in planning documents prepared at the municipality level, including the Study of the Conditions and Directions of Spatial Development and Local Spatial Development Plans. Determining the typology of buildings that can be located in specific areas may also help in the practice of issuing decisions on development conditions. The catalogue of possible solutions, together with the analysis of the produced communication systems, will allow to forecast the spatial shape of future investments and, consequently, to optimize the provisions limiting pathological solutions.

3. Field buildings in the areas affected by cities

The urban territories selected for the analysis are diversified both in terms of size and morphogenesis. Rzeszów [16] is a voivodeship city with a population of 198,000 inhabitants and an area of 129 km^2. In 2006–2021, the urban territory grew dynamically, doubling its area by absorbing fragments of neighbouring municipalities. This policy changed the character of the city periphery [17]. Due to the submontane nature and absorption of the main mass of scattered suburban development, the investment areas located within the city's influence area are relatively small and with low granularity.

Poznań [18, 19] is a large voivodeship city. The area of the city is 260 km^2, with a population of 530,000 inhabitants. The current phenomenon is the depopulation of the city and the movement of residents to the suburbs into the area of extensive development [20]. Migration of the population causes the expansion of the zone in the immediate vicinity of the city and its densification. When analysing the range and nature of the new spaces, one can notice the formation of a specific ring of overflowing buildings.

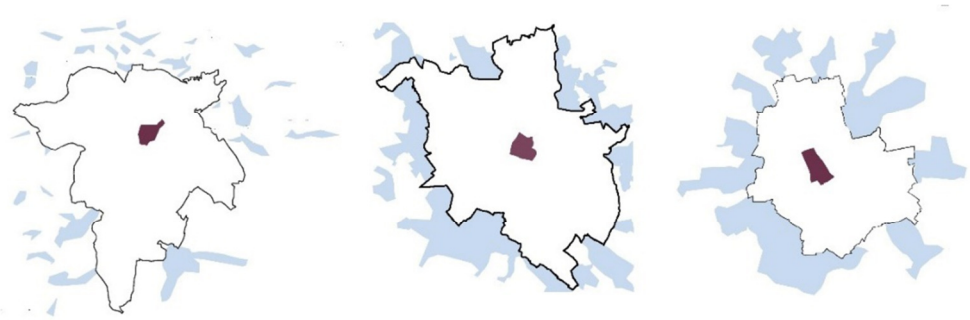

Fig. 1. The territories of cities with the outline of the area and range of the areas of spreading suburban buildings. Respectively, from the left: Rzeszów, Poznań, Warsaw, (prepared by N. Kublik)

The capital city of Warsaw [21] is the largest urban centre in Poland. It currently has 1.792 million inhabitants, and the number is constantly increasing. The area of the city is relatively small, it is 517 km^2. The correlation of the surface area and the number of inhabitants results in a very high density of buildings with high intensity of development. The specificity of the city being the capital causes a high investment pressure in the functional area of Warsaw [22, 23]. Outside the administrative territory of the city, there are compact and dispersed complexes of single-family and multi-family housing developments. The structure of suburban areas is mixed up, creating the impression of spatial chaos [24] (Fig. 1).

Three areas located in the above-mentioned suburban zones were selected for the detailed analysis. Each of these examples is characterized by different features but fits into the definition of field buildings.

Fig. 2. The zone of influence of Rzeszów. Free-standing and terraced residential buildings (source: google.pl/maps [access: 04.06.2021])

Fig. 3. Poznań influence zone. Free-standing and terraced housing development. Apart from that, there was an attempt to create an organic housing estate. (source: google.pl/maps [access: 04.06.2021])

Fig. 4. Warsaw zone of influence. Densification of field buildings of a varied nature. The granularity of the structure causes the integration of development units with the communication accessibility limited by the system. (source: google.pl/maps [access: 04.06.2021])

The examples selected for the analysis are representative for various forms of urban layouts and allow identifying some indicative types of such buildings. It should be noted that this is a typology appropriate for a short study like this article. Full identification of the typology of field buildings requires in-depth research.

Buildings located in different ethnographic regions have a different character due to the size of the plots (village type and field layout). In the area of influence of Rzeszów, the dominant type was a chain village (field) with very long and very narrow plots (Fig. 2). In the area of influence of Poznań, one can see the field layout of a street village, i.e. relatively large and wide plots (Fig. 3). On the other hand, plots of villages near Warsaw are of medium length and width (Fig. 4).

Table 1. Surface and demographic indicators (own study based on CSO 2021 data)

Main city	Number of inhabitants [thousand M]	Permanent migration balance	The area of the territory [km^2]	Population density [M/km^2]
Rzeszów	198	+ 1300*	129	1535
Poznań	530	- 2638	260	2038
Warsaw	1 792	+ 2060	517	3466

*Together with the residents of the Pogwizdów village council incorporated in 2021

The size of the main city (Rzeszów, Poznań and Warsaw), transport accessibility and investment pressure are also of great importance (Table 1). There is relatively little investment pressure in the vicinity of Rzeszów, mainly due to the absorption of attractive suburban areas by the city in 2006–2021. At the same time, the population density is very low and amounts to 1535 M/km^2. As a result, Rzeszów has a huge reservoir of potentially construction sites, which does not require permission to change the use of agricultural land for non-agricultural purposes.

Poznań is a shrinking centre. The population density is at the average level and amounts to 2038 M/km^2. In line with current trends, many inhabitants are looking for a quiet place to live that combines the features of a town and a village. For this reason, there is a high investment pressure on suburban areas.

Warsaw as the capital and the most dynamically developing urban centre is characterized by a very high building density index, as it is as much as 3466 M/km^2. Due to the depletion of investment areas and high real estate prices in the city, a lot of construction traffic can be noticed on its outer outskirts. It applies to both single-family and multi-family housing with relatively high intensity (obtained through the density of the structure).

As a result of the cartographic analysis of the orthophotomap, functional and spatial diagnosis and the table summary (Table 2), several types of suburban field development were distinguished:

- single terraced,
- double terraced,
- single linear,
- double linear,
- single comb,
- double comb,
- multi-track comb,
- checkerboard.

The types mentioned above do not exhaust the catalogue of possible types of land development in the area of influence of a large city, but they provide an image of the most common urban layouts created on plots of specific geometry.

Table 2. Typology of field buildings (based on three examples (own study))

Suburban zone		Identification of the urban layout	TYPE
Rzeszów	MJW	terraced on a very narrow plot	**single terraced**
	MJSz	terraced on a very narrow plot	**single linear**
Poznań	MJW	terraced on a narrow and relatively short plot	**single terraced**
	MJW	terraced on a narrow plot	**single terraced**
	MJSz	transverse comb on a wide plot	**comb**
Warsaw	MJB	terraced and transverse comb	**terraced**
			comb
	MJW	terraced "organic" on both sides of the perpend	**double terraced**
	MJSz	linear on both sides of the perpend	**double linear**
	MW	dense point development filling a large plot of land in a checkerboard pattern	**checkerboard**
	MW	comb in two series	**double comb**
	MW	comb in four series	**multi-track comb**

MJW – Single-family detached housing development
MJB – Single-family, semi-detached housing
MJSz – Single-family terraced housing development
MW – Multi-family housing development

4. Summary

The investment pressure on areas combining the features of a town and a village is becoming even greater. People are looking for a sustainable living environment [25] away from the city and its negative qualities. The influence on such behaviour of the COVID-19 virus pandemic, which made many people aware that during the period of isolation, contact with nature is essential for maintaining mental health, cannot be overlooked. It should be remembered that the effect of the pandemic is also the popularization of remote work or learning. Such a model of professional contacts, especially in the case of a large family, requires a larger living area, which will allow for the separation of many acoustically isolated, separate work spaces [26]. Extensive development, located in the suburban area, theoretically gives a chance to meet the above-mentioned needs.

An important aspect influencing living in the suburban area of a large city is the price of the plot. The attractive price of the plot can be obtained in housing estates created by dividing the former agricultural plot into smaller ones, located in the vicinity of dense building complexes. Such plots of land, even if they are not located in an urban area (the core or satellite city), do not require permission

to change the use of agricultural land for non-agricultural purposes and give a chance to obtain a positive decision on development conditions (in the absence of a Local Spatial Development Plan). The weakness of such a separation of building plots is the formation of a specific layout of buildings, the so-called field. The existence of many field estates, despite their apparent order, is chaotic, incoherent and inefficient in terms of communication from the landscape point of view. The article attempts to create a typology of the most characteristic layouts of housing estates and to indicate the main factors influencing the formation of building complexes. The catalogue of building types can be extended or detailed in another study of a different nature and volume. Having knowledge of the factors influencing the formation of given types of housing estates, it is possible to predict the directions of development of the settlement tissue, control this development and monitor changes. From the point of view of design practice, recognizing the types of buildings characteristics of the field system, with the highly probable assumption that the design of such a complex was determined by the guidelines contained in the administrative decision, may affect the optimization of provisions in the Local Development Plans carried out in a given area. Both in the case of preparing a local development plan and in an attempt to improve and clarify the communication system, typological studies can be helpful in maintaining the correct solutions, consistent with the principles of ensuring the functionality and compositional and landscape values of the area.

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