

Natalia GORGOL¹

ANALYSIS OF THE DYNAMICS OF CHANGES IN THE FORMATION OF MULTIFAMILY RESIDENTIAL BUILDINGS IN KRAKÓW OVER THE PERIOD 2014-2023

The article includes an analysis of the dynamics of changes in the formation of multi-family residential development in Krakow over the period 2014-2023 in four temporal comparison cycles (years: 2014, 2017, 2020 and 2023). The work is an attempt to answer the questions: (1) What are the dynamics of changes in multifamily residential development in Krakow? (2) What trends and characteristic patterns can be noted in this regard? In order to answer the above, the work proposes the author's method of studying the dynamics of change in the form of a comparison sheet. The sheet is divided into three sections: I. Quantitative data, II. Functional-utility standards. III. Economic standard. For each of the sections, indicators and parameters of multifamily residential development are listed, which are available in publicly available statistical databases provided by the Central Statistical Office (CSO). Thanks to the adopted methodology, the presented tool is universal and can be used to examine the situation regarding multifamily residential development in any city in Poland or in other temporal comparison cycles. The article uses this comparison sheet, examines the current state of affairs regarding the formation of multifamily residential development in Krakow and defines current trends and patterns regarding this issue.

Keywords: multi-family residential development, apartments, real estate market, Krakow

1. INTRODUCTION

The housing deficit in Poland is a social, construction and political challenge that has not been solved since the interwar period until today. This makes the issue of the development of multifamily housing an important, still topical and hotly debated issue. According to reports compiled by both the government and private companies, there is still a significant housing deficit in Poland. Reported figures on the housing gap range from to 650,000 housing units (data behind the 2020 *State of*

¹ Krakow University of Technology, Faculty of Architecture, Department of Urban Planning and Architecture of Urban Structures. ORCID: 0000-0003-3626-4748.

Housing in Poland report) to even approx. 2 million according to PwC's 2022 report *Institutional Tenancy – a lasting trend, not a fad*. The shortage of housing means that multifamily residential development accounts for the vast majority of new construction in Poland, with the largest number of multifamily residential buildings under construction in Poland's largest metropolitan areas. The dynamic development of multifamily residential development in Poland also makes the country's housing market stand out as one of the most rapidly growing in Europe, according to data from the *Living Sector in Poland Built-to-Sell, Private Rented Sector and Student Housing 2025 report*. In this context, what are the dynamics of changes in multifamily residential development? Are there any characteristic, noticeable trends noted?

The article attempts to answer the above questions in relation to one of the largest and most dynamically developing metropolises in Poland, the city of Krakow². The issue taken up in the paper is the study of the dynamics of changes in multifamily housing in Krakow over the period 2013-2024. The research hypothesis is the assumption that it is possible to define noticeable trends and patterns regarding the dynamics of changes in multifamily housing in Krakow. In addition, it is assumed that it is possible to create a tool in the form of a comparative spreadsheet, which will make it possible to study changes in multifamily residential development in any city in Poland or in any implementation cycles.

To verify the hypotheses set for the purpose of the article, three main research objectives were defined:

C1. Create a tool to conduct a qualitative study of changes in multifamily housing based on statistical data.

C2. Examine the dynamics of change in multifamily residential development in Krakow using the proposed tool over four comparison cycles (years: 2013, 2017, 2020, and 2023).

C3. Define noticeable trends and patterns regarding changes in multifamily residential development in Krakow.

The results of the study may have applied significance for representatives of local authorities, architects, researchers, as well as people interested in the issues of multifamily housing in Poland. The conclusions presented can serve as useful data for shaping local housing policy, as well as a form of report summarizing the current situation regarding multifamily housing in Krakow. In addition, the proposed research tool in the form of a comparison sheet, thanks to the universal nature of the comparative parameters, can be used to compare the parameters of multifamily housing in other Polish cities in given comparative time cycles, as well as the state of multifamily housing between cities in the same comparative cycles.

The article is divided into five chapters, the Introduction outlines the problem statement, hypotheses and research objectives. Chapter two presents the research

² Data behind the 2019 *Report on the State of Polish Metropolises: Kraków City on the Path of Stable Development*.

methodology. Chapter three the proposed research tool. Chapter four contains the results of the research for multifamily residential development in Krakow. Chapter five is a summary, including a discussion and conclusions of the research.

2. METHODOLOGY

In order to achieve the objectives of the study detailed in the introduction of the article, the following research steps were determined:

K1. Identify research methods, tools needed to achieve specific research objectives.

K2. Determine comparative parameters to study changes in multifamily housing. It was assumed that parameters of a universal nature would be used to build the tool from step K4.

K3. Define the time frame of the comparison cycle.

K4. Create a tool to conduct studies of changes in multifamily residential development over specific temporal comparison cycles.

K5. Conduct an analysis of multifamily residential development in Krakow in the given research cycles.

K6. Define noticeable trends and patterns.

K7. Drawing conclusions, validating the hypothesis and possibly deriving further research recommendations.

2.1. Research methods and tools

Diverse research methods were adopted for the study. The variety of methods made it possible to use a wide range of tools to achieve specific goals (see tab. 1).

Tab. 1. Summary of research methods and tools used

Research methods and tools		
	Tool	Target
A. Literature search (printed sources and reliable online sources), subject literature, analytical reports, reports and documents	Review and critical analysis of the literature on the subject	Examine the current state of knowledge regarding the characteristic parameters of multifamily residential development
	Review and critical analysis of subject literature, reports, reports and documents	Examining the current situation regarding multi-family residential development in Krakow

Research methods and tools		
	Tool	Target
B. Statistical search (Method of quantitative and statistical research) [Niezabitkowska 2014]	Analysis of quantitative and statistical data	Collection of quantitative and qualitative data, mainly based on CSO data
C. Qualitative research [Niezabitkowska 2014]	Comparison sheet	Checking the quality and comparative parameters of multifamily residential development in selected temporal comparison cycles in terms of meeting the quality criteria selected for the study
D. Analysis and visualization results [Finish 2024]	Charts and diagrams	Understanding and accessible presentation of data in a synthesized form to enable conclusions to be drawn
E. Logical argumentation	Critical assessment (analysis, processing of collected data and its synthesis)	Formulation of conclusions

2.2. Comparative parameters of multi-family residential development

The purpose of the research is to create a research tool for parameters of multifamily residential development, which would allow comparative analysis of multifamily residential development in the adopted temporal cycles of comparison or comparative analysis of the actual state of multifamily residential development between any cities in Poland. So, what parameters of development can be specified, and which of them have a universal character (that is, one that is independent of the conditions of the selected location, or can be compared in selected temporal cycles of comparison for different locations)?

The first step in answering the above question was a literature search on the parameters of multifamily residential development. Based on the existing state of knowledge, the author created a table taking into account the characteristic indicators and parameters of development, listing the elements that make up each indicator. For the methodology adopted, the table also indicates a reference to the systematics proposed in the literature (see tab. 2).

Tab. 2. Summary of comparative parameters of multi-family residential development

Type param.	Type standard	Indicator/parameter	Components
URBANISTIC	AMBIENT STANDARD [Dąbrowska-Milewska 2007]	Indicators and parameters for relations with the environment [Dąbrowska-Milewska 2007; Bradecki 2021]	shape of the ensemble in relation to conditions of sunlight, exposure, ventilation access to primary services related to the residential function and public services accessibility and transportation, parking and infrastructure conditions
		Indicators and parameters for natural elements [Schneider-Skalska 2004]	relief green/recreational areas, water assumptions climate
		Indicators and parameters z related to social space [Schneider-Skalska 2004; Dąbrowska-Milewska 2007; Pallado 2016; Bradecki 2021]	territorialism/ability to identify with a space community group urban interiors typology of spaces between buildings availability of space
		Indicators and parameters for land development [Bradecki 2021]	build-up area biologically active areas rainwater management share of paved areas
		Indicators and parameters for the scale and intensity of multifamily residential development [Dąbrowska-Milewska 2007; Bradecki 2021]	scale building intensity

Type param.	Type stan- dard	Indicator/ parameter	Components
ARCHITECTURAL	STRUCTURE BUILDINGS	Indicators and parameters for the structure of multi-family residential development [Pallado 2016; Bradecki 2021]	typology of multifamily residential development due to spatial shape
			typology of the building due to the formation of vertical communication
			building height/number of floors
			housing typology
	UTILITY STANDARD OF THE BUILDING [Dąbrowska-Milewska 2007]	Indicators and parameters for housing structure	housing structure
		Indicators and parameters for functional diversity of development	differentiation of functions
		Indicators and parameters for the standard of use of the building [Dąbrowska-Milewska 2007]	program and solution of common spaces, general communication zones
number of apartments per floor/staircase			
elements that increase the comfort of the building: elevators, garages, storage rooms,			
elements that increase the comfort of the building: balconies/terraces			

Type param.	Type standard	Indicator/parameter	Components
FUNCTIONAL-UTILITY	FUNCTIONAL STANDARD OF THE APARTMENT [Dąbrowska-Milewska 2007]	The parameter of usable area of the apartment	the size of the usable area of the apartment
		Functional and utility layout parameter [Dąbrowska-Milewska 2007]	the way of solving functional and spatial arrangements of the apartment and structure of the premises (including the number of living quarters)
			sun and light conditions in the apartment
		Indicators for the quality of housing use	ratio of population to dwelling area the ratio of the number of residents to the number of rooms in the apartment
COMMUNICATION	PARKING STANDARD	Indicators and parameters for transportation service [Bradecki 2021]	the number and location of parking spaces (surface/garage positions)
			number and location of bicycle parking spaces (outdoor spaces/bicycle rooms)
ECONOMIC	ECONOMY STANDARD	Economic indicators and parameters	construction cost per square meter of floor area of housing (PUM)
			market value of apartments/average price per sqm PUM
			operating costs
			affordability

The parameters of multifamily housing were divided into five main types: urban, architectural, functional-utility, transportation and economic.

For the purposes of the article, it is assumed, the division of comparative parameters of multifamily residential development into universal (that is, those that are

general in nature and remain independent of location and local law determinations) and dependent (that is, those that are related to locational conditions, natural conditions, connections with the environment, or result from detailed spatial and architectural and urban planning arrangements under the determinations of local spatial development plans, or decisions on the establishment of development conditions (WZ decisions).

Urban, transportation and some architectural parameters are not taken into account in the further study of the construction of the tool because of the dependence of characteristic urban-architectural parameters and parking standards (such as, among others, building intensity, building area, building height, required ratio of parking spaces) on the provisions of local law or individual decisions of the WZ. Which affects the inextricable link between specific architectural-urban characteristics and a given, specifically defined location, conditions and restrictions arising from the neighborhood of the plot on which the multifamily residential building is located.

Another important aspect for the construction of the comparison tool is the availability of data in the databases of the Central Statistical Office (CSO). The scarcity of data on most architectural features, parameters of the functional-utilitarian layout of apartments and the operating costs of mixing (as a component of economic indicators and parameters) led to the exclusion of these parameters as components of the comparison sheet.

As a result, the indicators and parameters of multifamily residential development in the rest of the study were limited to: the parameter of usable floor area of an apartment, the indicator of the number of living quarters, indicators on the quality of use of an apartment, and economic indicators and parameters.

2.3. Time frame of the comparative cycle

Determination of the length of the comparative cycle. For the purpose of the study, the author assumed that the dynamics of change in the formation of multifamily residential development requires the determination of specific time cycles at intervals longer than the year-to-year comparison periods. It was assumed that the optimal cycle would be to take the period required for actual change in the stock of multifamily residential development. It was assumed that such occurs from the start of construction to the occupancy of the apartment. According to CSO data [CSO 2024], the average duration of construction of multifamily residential buildings in the first three quarters of 2024 was 26.5 months, to which should be added the time needed to obtain an occupancy permit (another 21 days according to the duration of administrative procedures) and the time to finish and settle the apartment. (customarily another two to six months). The above adds up to between 29.5 and 33.5 months. Since most of the statistics needed for the survey are provided by the CSO at annual intervals, the time frame of the comparison cycle has been rounded to three years.

Timeframe for determining comparative cycles. One of the criteria of the study was to show the most up-to-date dynamics of changes in the formation of multifamily housing. However, some of the statistical data needed for this purpose are made available by the CSO in the second half or at the end of the following calendar year relative to the year under study. At the time of compiling the article, not all the data for 2024 was available, hence 2023 was adopted as the closing year of the comparison cycles. This is the last year having the full range of statistical data needed for the study.

For the purpose of the article, four comparison cycles were determined, namely 2023, 2020, 2017 and 2014.

3. TOOL

This chapter presents a proposal for a tool to analyze the facts of multifamily residential development in the form of a comparison sheet. The premise was to create a universal tool that would allow the study of changes in multifamily residential development in any city in Poland or in any comparative cycles using data from CSO statistical databases. Accordingly, in Chapter Two of the article, a selection of comparative parameters of multifamily residential development was carried out to the universal parameters that allow the realization of the research objective set in the work. The parameter of usable floor area of an apartment, the parameter of functional-utility layout in terms of the number of rooms in an apartment, indicators relating to the quality of use of an apartment, and economic indicators and parameters were classified as such. In order to provide a broader spectrum of opportunities to observe changes occurring in the principles of formation and standard of multifamily residential development, the comparative parameters of development were supplemented with quantitative data on the stock of multifamily residential development. The comparison sheet was divided into three sections: I. Quantitative data, II. Functional-utility standard, and III. Economic standard. The proposed survey tool is presented in table 3.

Section I contains quantitative data on population, number of residential buildings, number of apartments, proportion of housing stock, and data on the number and proportion of building permit decisions for multi-family housing. The tool has been supplemented with quantitative data so as to facilitate observing the dynamics of changes in the formation of multifamily housing in relation to changes in demographics and the city's global resources. The quantitative data allows observing the trend of growth or contraction of the multifamily residential development market in the context of the city's development trends.

Section II contains data on the functional-utility standard, which includes: the size of the floor area of the apartment, the number of rooms in the apartment, floor area per person, and the ratio of the number of people per room in the apartment.

Section III contains tools for studying economic conditions in accordance with the proposed methodology of economic indicators. The CSO database lacks some of

the information on the economic standard, such as the average cost of construction of 1 square meter of floor area of apartments in multifamily housing, or the average operating costs of multifamily housing. Therefore, these parameters were excluded from use in the comparison sheet.

Tab. 3. Comparison sheet of parameters of multi-family residential development

Section	Type of indicator/parameter	l.p. Parameter comparison
I. QUANTITATIVE DATA	Population	1.1 number of residents in the city
	Number of residential buildings*	1.2 number of buildings residential in the city
	Number of apartments*	1.3 number of dwellings in city
	Proportion of housing stock in ratio to population (number of residents per dwelling)	1.4 the ratio of the number of inhabitants per 1 dwelling
	Number of construction permits (PnB) obtained for multi-family residential buildings	1.5 number of construction permits obtained for multi-family residential buildings
	Share of construction permits (PnBs) obtained for multifamily residential development in relation to the total number of obtained PnBs and notifications with design for residential buildings.	1.6 Proportion of PnBs for multi-family residential development in relation to total PnBs for residential buildings
II. FUNCTIONAL AND UTILITY STANDARD	The parameter of usable area of the apartment the size of the usable area of the apartment*	2.1.1 average size of usable area of the apartment – total
		2.1.2 average size of usable area of the apartment – apartments put into use
	Functional and utility layout parameter number of rooms in the apartment*	2.2.1 average number of rooms in 1 dwelling – total
		2.2.2 average number of rooms in 1 dwelling- dwellings put into use
	Indicators for quality of use apartments number of persons per 1 room in the apartment*	2.3. floor area per person * average floor space per person -total
		2.4. number of persons per 1 room in the apartment* average number of persons per room in a dwelling*

Section	Type of indicator/parameter	l.p.	Parameter comparison
III. ECONOMIC ECONOMIC STANDARD	Economic indicators and parameters	Market value of apartments/average price per sqm PUM	3.1.1 Market value of apartments/ average price per sqm of total PUM
			3.1.2 Average price per square meter of PUM on the primary market
			3.1.3 Average price per square meter of PUM on the secondary market
		Financial accessibility (expressed as the ratio of the average gross salary to the average price per square meter of PUM)	3.2. financial availability of housing
			Financial availability – government support (criterion for occurrence of programs considered to be working and operating on a large scale)

Note: items marked in the table “*” in the CSO databases have statistical data for residential development, with no division into single-family and multi-family housing.

4. RESULTS OF THE STUDY

The results of the fact-finding survey on multifamily residential development in Krakow from 2014 to 2023 using the proposed tool are presented in table 4. The following subsections present a summary and synthesis of the survey for each of the three sections: I. Quantitative data, II. Functional-utility standard, III. Economic standard.

Tab. 4. Results of the study of parameters of multifamily residential development in Krakow in 2014-2023

Section	Type of indicator/parameter	L.p.	COMPARISON CYCLE			
			2014	2017	2020	2023
I. QUANTITATIVE DATA	Population (in thousands of people)	1.1	761,87	767,35	800,53	806,20
	Number of residential buildings*	1.2	47 137*	49 150*	52 980*	56 426*
	Number of apartments*	1.3	353 610*	380 088*	431 775*	458 246*
	Proportion of housing stock (number of residents per housing unit)	1.4	2,15	2,02	1,85	1,76
	Number of construction permits obtained for multi-family residential buildings	1.5	70	157	92	76
	Share of construction permits obtained for multifamily residential development in relation to the total number of obtained PnBs and notifications with design for residential buildings	1.6	13,04%**	21,30%**	15,26%**	13,79%**
II. FUNCTIONAL AND UTILITY STANDARD	Parameter usable area of the apartment* average size of usable area of the apartment – total	2.1.1	57,7*	57,7*	57,7*	57,8*
	Parameter usable area of the apartment* average size of the usable area of the apartment – apartments put into use	2.1.2	59,8*	56,1*	58,4*	60,1*
	Functional-utility layout parameter: average number of rooms in 1 dwelling – total*	2.2.1	3,17*	3,13*	3,10*	3,08*
	Functional-utility layout parameter: average number of rooms per dwelling-dwellings put into use *	2.2.2	2,7*	2,6*	2,7*	2,7*
	Indicators for the quality of housing use Average floor space per person -total*.	2.3.1	26,8*	28,6*	31,1*	32,8*
	Indicators on the quality of use of housing * average number of persons per room in a dwelling*	2.4	0,68*	0,64*	0,60*	0,57*

Section	Type of indicator/parameter	L.p.	COMPARISON CYCLE			
			2014	2017	2020	2023
III. ECONOMIC STANDARD	Market value of apartments/ average price per 1 sqm of total PUM (PLN)	3.1.1	6 339	6 497	8 277	11 721
	Average price per 1 m2 of PUM on the primary market (PLN)	3.1.2	6 591	6 582	8 177	11 460
	Average price per 1 m2 of PUM on the secondary market (PLN)	3.1.3	5 764	6 363	8 434	12 062
	Financial accessibility ** (ratio of average gross salary to average price per m ² of PUM)	3.2.	0,66**	0,76**	0,78**	0,79**
	financial availability- government support- (the criterion for the occurrence of programs considered to be operating and operating on a large scale)	3.3	Apartment for the Young (MdM)	Apartment for the Young (MdM)	(non-functional Housing Plus Program)	Yes (First Housing Program, the so-called 2% Safe Credit)

* statistics for residential development, with no division between single-family and multi-family housing

** own calculations

Source: own compilation based on CSO statistics available on the authority’s official website.

4.1. Section I. Quantitative parameters of multifamily residential development in Krakow from 2014 to 2023.

A synthesis of the survey results for Section I. Quantitative data characterizing multifamily residential development in Krakow is presented in figure 1. The number of dwelling units and apartments shown in the chart is presented collectively for single-family and multifamily residential development due to the availability of data resources in CSO databases. It should be noted that according to CSO statistics, in each research cycle the share of housing units completed in new multi-family buildings in the total number of housing units completed in new residential buildings accounted for 90%. Hence, it can be concluded that despite the lack of separation in the database between single-family and multifamily housing, the graph accurately depicts the dynamics of change in the stock of multifamily housing.

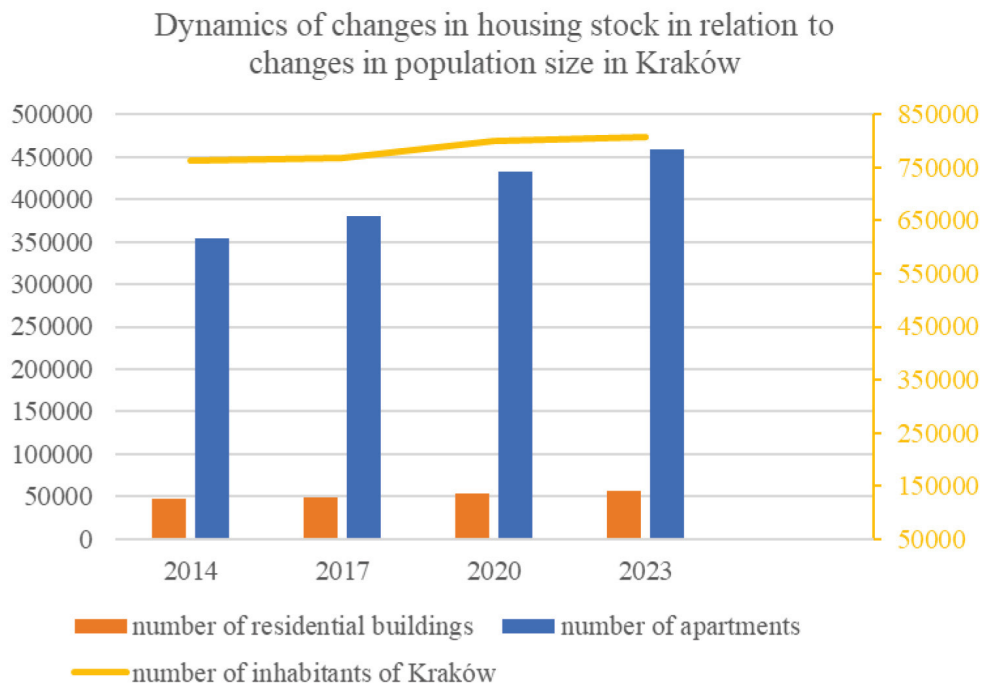


Fig. 1. Illustration of the dynamics of changes in the housing stock in relation to changes in the size of the population in Cracow. On the axes in black are marked the scale for the number of apartments and residential buildings, in yellow the scale for the number of people. Values are given in thousands [own compilation based on CSO statistics available on the authority's official website]

From 2014 to 2023, a steady development of multi-family residential development and an increase in the supply of housing units can be noted. During this period, the increase in the number of residential buildings (an increase in the stock of 9289 buildings) in relation to the increase in the number of housing units (an increase in the stock of 104,636 units) indicates a trend of multi-family residential development with a significant intensity and number of units. This is also indicated by the number of building permit decisions obtained for multifamily housing equal to 395 during the period, as well as the percentage of building permit decisions for multifamily housing in total administrative decisions for residential buildings (see sections 1.5 and 1.6 of tab. 4).

While the increase in the number of housing units over the time period under review is steady, the dynamics of the increase in the number of housing units does not coincide with the dynamics of the increase in Krakow's population, which was strongest between 2017 and 2020. During this period, there was no clearly visible increase in the supply of housing units compared to the other comparative cycles.

The proportions of residents per housing unit have been improving steadily but relatively statically over the time period under review. From 2014 to 2023, the ratios have improved from 2.15 persons per dwelling (2014 data) to 1.76 persons per dwelling (2023 data) (see section 1.4 tab. 4).

4.2. Section II. Functional and utilitarian parameters of multifamily residential development in Krakow in 2014-2023

As in Section I, the data made available in the CSO databases on the functional-use standard of residential development are presented collectively for single-family and multifamily residential development. However, given the reasoning on the share of multifamily residential development presented in Subsection 4.1, these data can be considered to reflect the dynamics of change in the multifamily residential market.

Figure 2 shows changes in the average floor area of apartments collectively for existing and completed apartments (blue) and for completed apartments (orange). The parameter of average floor area taking into account existing and new apartments is characterized by exceptional stability. Over the period 2014-2023, it increased by 0.1 m² and amounted to 57.8 m². Larger fluctuations in the average usable area of an apartment can be noted for new apartments put into use during this period. A pattern regarding the decreasing usable area of apartments can be seen between 2014 and 2017. In 2017, the average usable area of an apartment was equal to 56.1 m². In 2020, there was an increase in the average area to 58.4 m². The upward trend was also present in 2023. The increase in the usable area of apartments from 2020 should be linked to the design and purchasing trends of apartments as a result of the COVID pandemic in 2019.

During the period under review, there was a systematic increase in the average floor area per capita, moderate in time, which indicates a progressive but not rapid improvement in the quality of life in housing. In 2023, this parameter reached a value of 32.8 m². Here it is worth comparing this area to the minimum permissible area of an apartment according to current legislation, which is min. 25 m². The above comparison illustrates a rather favorable pattern of the quality of use of apartments in Krakow.

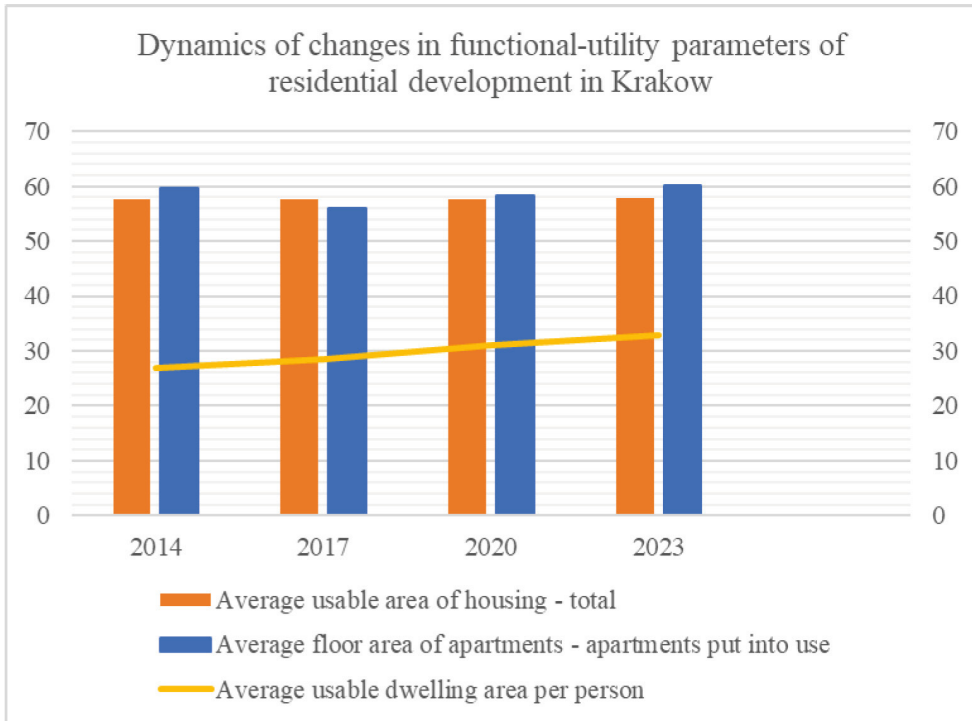


Fig. 2. Illustration of the dynamics of changes in the functional-utility parameters of residential development in Krakow [own compilation based on CSO statistics available on the official website of the authority]

Figure 3 shows the relationship of floor area per capita and the dynamics in changes in the average number of rooms in apartments collectively for existing and completed apartments, and separately for new apartments. While, as discussed in the previous paragraph, there have been noticeable changes in the average floor area per capita, the average number of rooms in dwellings put into use has remained remarkably stable. In most of the comparative cycles studied, it was 2.7 rooms per apartment. Analyzing the average number of chambers in existing dwellings and dwellings put into use, a steady trend of decreasing numbers of chambers can be observed. From the comparison of these two parameters, it can be deduced that in the period from 2014 to 2023, significantly smaller apartments were designed as in earlier years.

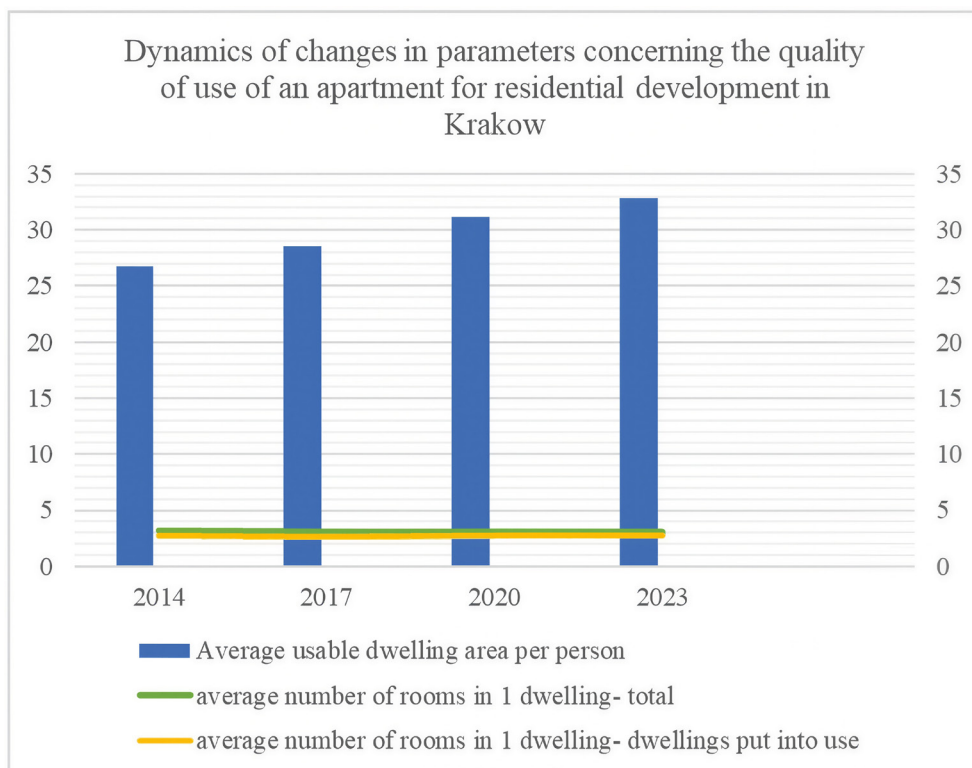


Fig. 3. Illustration of the dynamics of changes in parameters concerning the quality of use of a dwelling for residential development in Krakow [own compilation based on CSO statistics available on the official website of the authority]

4.3. Section III. Economic parameters of multifamily residential development in Krakow in 2014-2023

The economic parameters of the dynamics of changes in multifamily residential development in Krakow are shown in figure 4. In the period from 2014 to 2023, the average price of 1 m² of usable floor area (PUM) of an apartment increased to the amount of PLN 11,721, and the price increase compared to 2014 is 184%. The nominal increase in housing prices can be considered highly dynamic. However, when analyzing the price of 1 m² of PUM in relation to the value of the average gross salary, financial accessibility to housing remains relatively similar in the comparative time cycles assumed in the study. Interestingly, the weakest financial accessibility in this context occurred in 2014, when apartment prices in Krakow were the lowest in the time period studied. At that time, the ratio was 66%, which meant paying 152.65% of the average gross salary for 1 sqm of PUM. By comparison, in 2023, the

ratio was 79%, which was equivalent to having to pay 127.07% of the average gross salary per 1 sqm of PUM.

The second major determinant for the jump in housing prices was government programs to support the purchase of a first home. In 2014 and 2017, housing prices were at a fairly similar level, which can be considered the aftermath of the program “Housing for the Young”. The period of the program’s operation was from 2014 to 2018. The most significant increase in the price of 1 sq. m. of PUM in the time period under review occurred in 2023, which can be associated with the introduction of another government program, “Program First Apartment, Safe Credit 2%”.

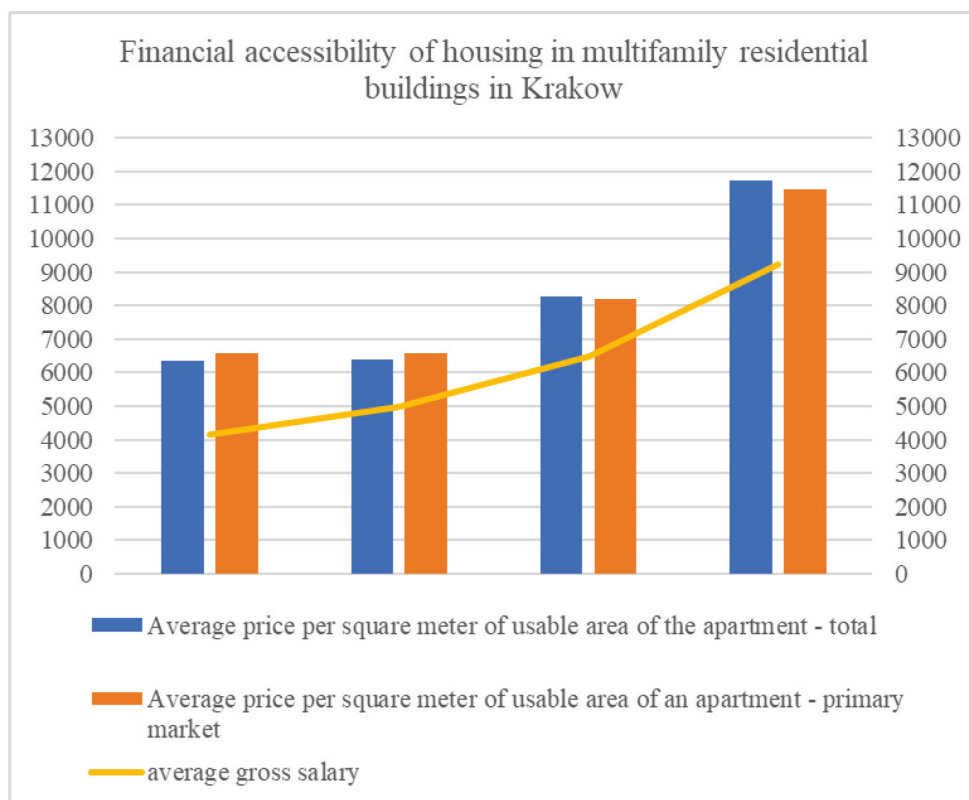


Fig. 4. Illustration of the dynamics of financial accessibility to housing in multifamily residential buildings in Krakow in relation to the average price of 1 m² of PUM and the average gross salary [own compilation based on CSO statistics available on the official website of the authority]

5. SUMMARY

A literature search revealed that numerous studies relating to the analysis of multifamily residential development or its complexes in Krakow can be found in the literature. However, they are mostly in the nature of studies on a specific typology or intensity of development, such as Gyurkovich, 2019 (Part 1) and analyses of selected case studies [Gyurkovich 2019 (Part 2); Gyurkovich, Gyurkovich 2021] or are comparative analyses of multifamily residential development in Krakow to other cities [Gyurkovich, Sotoca 2019; Bradecki 2021]. For the most part, these analyses refer to parameters or features of development that can be categorized as resulting from local conditions. However, there is quite a small group of studies of a holistic nature, presenting global trends regarding multifamily residential development in Krakow. Here we can mention a study on the preferences of potential buyers of apartments in terms of development parameters [Adamkiewicz, Radziszewska-Zielina 2019], an analysis of the typology of multifamily residential development in Poland in 2010-2019, including Krakow examples [Trębacz, Mazur 2020]. This article fills the gap in terms of a global perspective on conditions related to multifamily residential development in Krakow.

The presented research proved the hypotheses put forward. Based on the results of the research presented in the article, the conclusion arises that the dynamics of changes in the formation of multifamily housing in Krakow is stable and is characterized by a steady development of this typology of housing in the city. As a result, a significant increase in the number of apartments in multifamily residential buildings has been recorded during the period under study. A noticeable pattern is the formation of multi-family residential development of considerable intensity, with a large number of apartments in individual buildings. The continuous development of multifamily housing in Krakow results in an improvement in the quality of housing in the context of increasing usable area of apartments per capita with a constant, fairly small number of rooms per apartment and a relatively fairly stable, low average usable area of apartments.

However, when analyzing data related to the size of usable floor space in relation to the number of people, as well as the number of rooms per capita, it should be taken into account that the statistical data on residents refers to people registered for permanent and temporary residence. Thus, they do not take into account, among others, people renting apartments without registration. This state of affairs can have a significant impact on the formation of the levels of indicators on the size and quality of use of housing, which is a kind of imperfection and limitation for the study of the functional-utility standard of housing on the basis of statistical databases of the Central Statistical Office.

The economic standard of multifamily residential development in Krakow in terms of financial accessibility to housing despite the galloping nominal increase in prices, understood as the ratio of the average gross salary to the price

of 1 m² of usable floor area of an apartment, remains at a relatively similar level. The financial accessibility of housing in Krakow, as well as globally throughout Poland, is inextricably linked to the trend of significant increases in the price of 1 m² of usable floor area of an apartment as a result of the introduction or announcement of new government programs to support the purchase of the first apartment.

The article proposed a new tool for studying the actual state of multifamily residential development in Poland in terms of universal parameters, such as functional-utility parameters, as well as quantitative and economic standard. In the conducted research it was proved that the comparison sheet as a research tool allows diagnosing and valorizing the universal parameters and indicators of multifamily residential development. It allows to determine the dynamics of the formation of the economic standard, selected aspects of the functional-utility standard of the development and quantitative data. It would also be recommended to further test the tool on other cities.

In order to obtain as objective a picture as possible of the quality of the residential environment and trends in its formation, the results of the analysis using the comparison sheet should also be juxtaposed with studies of the actual state of affairs regarding the parameters and indicators of multifamily residential development called local in the article, i.e. urban, architectural, and transportation parameters. In the context of Krakow, it is worth noting that while the analysis of multifamily residential development in Krakow based on the universal parameters indicated in the comparison sheet shows a tendency to improve the quality and quantity of multifamily buildings and apartments, quite often the local parameters deteriorate or are shaped at the same level.

LITERATURE

- Adamkiewicz D., Radziszewska-Zielina E., 2019, *A housing market analysis for the city of Krakow*, "Technical Transactions", vol. 116, iss. 9.
- Bradecki T., 2021, *Wskaźniki, parametry i modele w kształtowaniu intensywnej wielorodzinnej zabudowy mieszkaniowej*, Wydawnictwo Politechniki Śląskiej, Gliwice.
- Dąbrowska-Milewska G., 2007, *Propozycja klasyfikacji standardu zabudowy mieszkaniowej wielorodzinnej w odniesieniu do zasobów powstałych w Polsce po roku 1990*, „Problemy Rozwoju Miast”, 3, s. 56-65.
- GUS, 2024, *Budownictwo w 1-3 kwartale 2024 roku*, https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5478/13/24/1/budownictwo_w_1-3_kwartale_2024_roku.pdf (dostęp: 10.12.2024).
- Gyurkovich J., 2019a, *Living Space in A City. Selected Problems of Shaping Modern Housing Complexes in Cracow. A Multiple Case Studies: Part 1. The Case Study of Urban Villas*, IOP Conference Series: Materials Science and Engineering, vol. 471, iss. 9.

- Gyurkovich J., 2019b, *Living Space in A City. Selected Problems of Shaping Modern Housing Complexes in Cracow. A Multiple Case Studies: Part 2. The Case Study of High Density Forms of Multi-Family Residential Buildings*, IOP Conference Series: Materials Science and Engineering, vol. 471, iss. 9.
- Gyurkovich M., Gyurkovich J., 2021, *New Housing Complexes in Post-Industrial Areas in City Centres in Poland Versus Cultural and Natural Heritage Protection – With a Particular Focus on Cracow*, "Sustainability", 13 (1), 418.
- Gyurkovich M., Sotoca A., 2019, *Quality of Social Space in Selected Contemporary Multifamily Housing Complexes in Poland's Three Biggest Cities*, IOP Conference Series: Materials Science and Engineering, vol. 471, no. 9.
- Jones Lang LaSalle, 2025, *Living Sector in Poland Built-to-Sell. Private Rented Sector and Student Housing*, Polska.
- Kończak G., 2024, *Wizualizacja wyników badań naukowych. Zasady, metody i narzędzia*, Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice.
- Ministerstwo Rozwoju, 2020, *Raport. Stan mieszkalnictwa w Polsce*.
- Niezabitowska E., 2014, *Metody i techniki badawcze w architekturze*, Wydawnictwo Politechniki Śląskiej, Gliwice.
- Pallado J., 2016, *Typologia zabudowy wielorodzinnej: teoria, dydaktyka, praktyka*, Wydawnictwo Politechniki Śląskiej, Gliwice.
- PricewaterhouseCoopers, 2019, *Raport o stanie polskich metropolii: Kraków. Miasto na ścieżce stabilnego rozwoju*, 4 edycja.
- PricewaterhouseCoopers, 2022, *Najem instytucjonalny – trwały trend, a nie chwilowa moda*.
- Schneider-Skalska G., 2004, *Kształtowanie zdrowego środowiska mieszkaniowego. Wybrane zagadnienia*, Politechnika Krakowska, Kraków.

ANALIZA DYNAMIKI ZMIAN W KSZTAŁTOWANIU ZABUDOWY MIESZKALNEJ WIELORODZINNEJ W KRAKOWIE NA PRZESTRZENI LAT 2014-2023

Streszczenie

Artykuł obejmuje analizę dynamiki zmian w kształtowaniu zabudowy mieszkaniowej wielorodzinnej w Krakowie na przestrzeni lat 2014-2023 w czterech czasowych cyklach porównawczych (lata 2014, 2017, 2020 oraz 2023). Praca jest próbą odpowiedzi na pytania: (1) Jak wygląda dynamika zmian zabudowy mieszkalnej wielorodzinnej w Krakowie? (2) Jakie trendy i charakterystyczne wzorce można odnotować w tym zakresie? Aby na nie odpowiedzieć, w pracy zaproponowano autorską metodę badania dynamiki zmian w formie arkusza porównawczego. Arkusz podzielono na trzy sekcje: I. Dane ilościowe, II. Standard funkcjonalno-użytkowy, III. Standard ekonomiczny. Dla każdej z sekcji wyszczególniono wskaźniki i parametry zabudowy mieszkalnej wielorodzinnej, które można znaleźć w ogólnodostępnych bazach danych statystycznych udostępnianych przez Główny Urząd Statystyczny (GUS). Dzięki przyjętej metodologii prezentowane narzędzie ma charakter

uniwersalny i może być wykorzystane do zbadania sytuacji dotyczącej zabudowy mieszkalnej wielorodzinnej w dowolnym mieście w Polsce lub w innych czasowych cyklach porównawczych. W artykule wykorzystano niniejszy arkusz porównawczy, zbadano aktualny stan rzeczy w zakresie kształtowania zabudowy mieszkalnej wielorodzinnej w Krakowie oraz zdefiniowano aktualne tendencje i wzorce dotyczące tego zagadnienia.

Słowa kluczowe: zabudowa mieszkalna wielorodzinna, mieszkania, rynek nieruchomości, Kraków