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## **Housing security as an indicator of the living environment**

### INTRODUCTION

In the context of the innovative development of the economy of the Republic of Belarus and the increasing role of the human factor in the development of all spheres of the economy, the requirements for the social reproduction of a person as a creative, active person, and in general for the quality of life, are changing. Solving the housing problem has become the most important task of managing the development of the housing sector and an integral part of general structural transformations, one of the priorities of the state socio-economic policy, of which housing policy is a part.

The object of the research is a statistical study of the housing security for the population of the Republic of Belarus as an indicator of the living environment and the social policy of the state.

The ultimate goal of the study is to analyse the dynamics and regional characteristics of housing security for the population, both within the country and between countries, including the study of the development of the living environment and the factors affecting it.

### THEORETICAL AND METHODOLOGICAL APPROACHES TO RESEARCH

The term ‘quality of life’ was introduced into scientific circulation by J. Galbraith (Galbraith, 2008) in the middle of the twentieth century and has since become one of the key concepts of the entire complex of sciences that study

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various aspects and conditions of human life, the most important integral indicator of comparative socio-economic research.

In the study of the 'quality of life' category, there are several approaches: objectivist and subjectivist, individual and institutional (Bestuzhev-Lada, Batygin, Grishaeva, 1978).

T. Parsons and N. Smelzer adhered to an objectivist approach to understanding the quality of life (Babosova, Mamedov, Panich, 2015), A. Campbell, F. Converse, W. Rogers, F. Andrews, S. Whitney adhered to the subjectivist approach (Campbell, Converse, Rodgers, 1976; Levy, Anderson, 1979).

Representatives of the individualist school in understanding the quality of life: L. Anderson, A. Campbell, F. Converse, L. Levy, and W. Rogers (Campbell, Converse, Rodgers, 1976; Levy, Anderson, 1979) believed that this concept reflects the satisfaction level of individual needs.

At the same time, within the framework of the institutional approach (W. Bell, J. Galbraith, A. Toffler, and J. Forrester), the quality of life acts as an indicator of the efficiency and stability of the development of a local, territorial community, or society as a whole (Bell, 1973; Toffler, 1990; Galbraith, 2008).

We believe that it is advisable to adhere to the integral approach, which is also adhered to by several researchers. In domestic science, this point of view is represented by the works of B. M. Genkin, A. A. Davydov, E. V. Davydova, G. P. Petropavlova, E. V. Fakhrutdinova, and others. (Genkin, 2008; Davydov, 2008; Petropavlova, 2011)

The study of the living environment and housing policy issues is based on the scientific work of many foreign and domestic scientists. The focus of research extends to many components of the housing sector: the housing market, housing and communal services, housing construction financing, and others.

Studies by foreign scientists D. Daniel, R.J. Strike reveal the functioning of the housing sector economy as part of a developed market system (Struyk, Damon, Haddaway, 2010; Daniell, Puzanov, Struyk, 1993).

The assessment of the formational characteristics of the housing market and a comprehensive solution to the housing problem was carried out by Russian scientists: A.S. Puzanov, N.B. Kosareva, V.V. Buzyrev and several others (Kosareva, Polidi, Puzanov, 2015).

In modern economic literature, no well-established terminological apparatus uniquely defines the totality of processes that provide a solution to the housing problem (Moroz, Kuznetsov, Shashko, 2006).

In the housing sector, there are economic actors: consumers and households, producers, and the government, and they all have multidirectional interests. Housing policy ensures the interests of economic entities in the housing sector (*Housing Code of the Republic of Belarus...* 2012).

Under market conditions, each economic entity builds its own policy of behaviour, based on its own economic goals and interests. At the same time, they

are within the state's economic policy framework. The degree of government influence is not the same in different periods of time.

In modern European literature, the idea of three different types of state housing policies has developed.

These are liberal, social-democratic, and corporatist models; they reflect the differences in the main directions of housing policy (*Delivering stability...*, 2004; Holmans et al., 2010).

The social-democratic model is characterised by a rather strong state intervention in housing policy issues. Housing security is carried out on a general basis, and not based on the results of a means test.

Under the liberal model, the market plays a decisive role, while social benefits and services are used to provide social protection for the most vulnerable population groups. Social subsidies are provided to the most socially vulnerable families (Green, Malpezzi, 2003).

The corporatist model assumes that social security in the housing sector is carried out based on an agreement between the social partners and the state. This model is characterised by the "translation" of the social hierarchy into the hierarchy in the housing sector, while the position in the hierarchy is determined by belonging to a certain group (corporation): trade unions or other professional corporations (Hoekstra, 2003; Hoekstra, 2010).

Housing needs and interests have not been legally enshrined in international legal acts and national legislation. The Universal Declaration of Human Rights (Universal Declaration ..., 1948, [http](http://www.unhcr.org/refugees/article/318.html)) provides for humans to freely choose their place of residence within each state and the inviolability of the home. But this freedom is not associated with the presence or absence of a person's home. Under the International Covenant on Economic, Social and Cultural Rights (International Covenant, 1964), States parties recognise the rights of everyone to an adequate standard of living for him and his family, including adequate food, clothing, and housing. In this case, only the three most important natural human needs are declared without determining the mechanisms for their provision. The Constitution of the Republic of Belarus (Article 48) defines the right to housing, which is ensured by the development of public and private housing stock (Constitution of the Republic of Belarus, 1994).

At the same time, improving the living environment of citizens is one of the most important constitutional tasks of the state, including in terms of its international obligations. In the UNECE Housing Policy Principles (UNECE, [http](http://www.unhcr.org/refugees/article/318.html)), the right to adequate housing is one of the most important human rights.

The sufficiency is determined, first of all, by the social, economic, cultural, climatic, ecological, and other factors of each particular country. The interaction of government, business and science in managing the development of the living environment is of particular importance. This area covers a group of economic

sectors, including the design of construction and reconstruction of housing, structures and elements of engineering and social infrastructure, the creation of the living environment in general, housing serving the housing stock, its maintenance and repair, as well as the housing market.

General scientific methods were used to achieve the study objectives: synthesis, analysis, deduction, a systematic approach, study of a series of dynamics, analysis of the influence of factors on the result using the index method, and analysis of the population using cluster analysis.

As a result of clustering, a dendrogram was obtained that depicts a hierarchical structure. It is generated by the similarity matrix and the rule for combining objects into clusters.

It was assumed that the analysed group of countries forms two natural clusters. This assumption was tested using the K-means method, while the significance of the difference between the obtained groups was examined. Clustering using the K-means method showed significant differences for each factor ( $p < 0.05$ ).

The first cluster included countries with a lower standard of living. The second cluster is distinguished by the presence of countries with a higher overall level of indicators characterising the standard of living, among which is the provision of housing for the population.

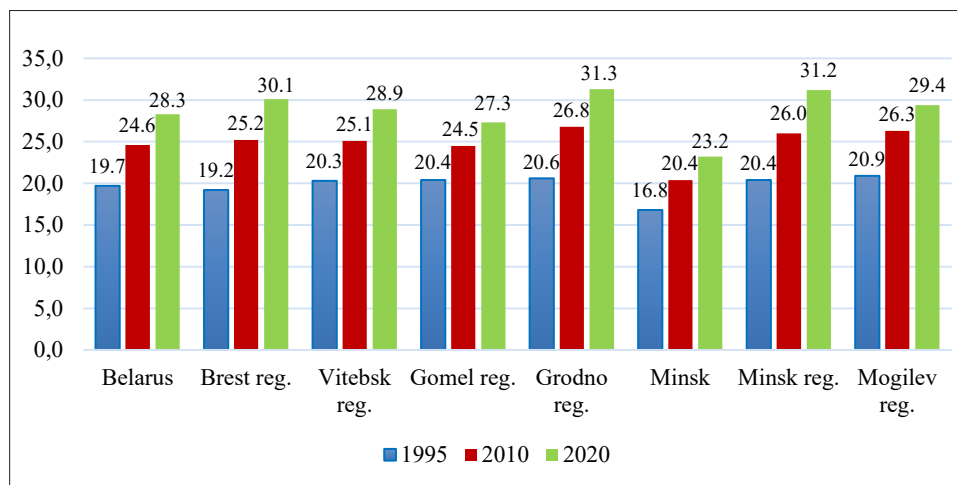
The study was carried out on the basis of the data from the Belarus Statistical National Committee and Eurostat for 1995–2020.

#### STATISTICAL ANALYSIS OF FACTORS THAT DETERMINE THE LEVEL OF HOUSING SECURITY

The transition to sustainable economic recovery in the Republic of Belarus is largely determined by the active participation of the regions in this process. The solution to the socio-economic problems of the country as a whole and its individual structural subdivisions is inextricably linked with the implementation by the state of a scientifically grounded regional policy, aimed at improving the living environment.

One of indicators of the quality of life, which characterises the total area of living quarters per inhabitant, is the housing security of the population, according to the Belstat methodology.

The dynamics of housing security of the population of the Republic of Belarus for the period 1995 to 2019 is presented in Figure 1. On the basis of the data presented, one can see the positive dynamics of this indicator. The housing security of the population of Belarus in 2019 increased 1.4 times compared to 1995, reaching 27.8 square meters per person.



**Figure 1. Dynamics of the housing security for the population of the Republic of Belarus by regions and the city of Minsk for 1995, 2010 and 2020, sq. m. per person**

Source: own development based on (National Statistical Committee. Official statistics, 2021; World development indicators, 2021; Statistical Yearbook, 2021).

The housing security for the population in the regions of Belarus was studied. The highest dynamics can be noted in the Grodno region; moreover, for the entire studied period, it increased to 31.3 sq. m. per person or increased by 52% compared to 1995. Second is the Minsk region, where the supply increased to 31.2 sq. m per person, or 52.9%. At the same time, it turns out that the value of this indicator varies in regions of the country from 20.2 square meters of total area per inhabitant to 44.8 square meters (Glusky district).

The lowest security indicators are observed in the capital, the city of Minsk. In 2020, security amounted to 23.2 sq. m per person, or an increase of 38.1%. This is due to the fact that the population in Minsk increased from 1,669.5 thousand people to 2,009.8 thousand people for 1995–2020, or 20.4%. This leads, first of all, to an increase in the number of residents who do not have their own housing. In other regions, as well as in Belarus as a whole, the population size decreased during the period under study. A decrease in population was observed across the country from 10,177.3 to 9,349.6 thousand people, or 8.1%. The largest decrease in the regions occurred in the Vitebsk region, by 20.9%, in the Mogilev region, by 18%.

Analysis of changes in the provision of the population with housing using indices of variable composition, constant composition, and structural changes allows us to identify the influence of factors on the dynamics of provision for 1995–2020 in the regional context (Table 1).

**Table 1. Contribution of factors to the change in the average housing security, 1995–2020, %**

Contribution of factors to change	Years	
	1995–2020	2010–2020
The overall change in the average security is due to:	43.6	15.0
– changes in the housing security of certain regions	46.5	15.6
– changes in the structure of the population of certain regions	-2.0	- 0.5

Source: own development based on (National Statistical Committee. Official statistics, 2021; World development indicators, 2021).

As can be seen in the table, the growth in the average housing supply of the population of Belarus was positively influenced by the growth in the level of housing in certain regions of the republic (over the past 25 years, a growth of 46.5%, over the past 10 years, by 15.6%), at the same time, the change in the structure of the population had a negative impact on the average value of security in the republic. This is due to the fact that the proportion of the population of the city of Minsk with the lowest level of security has grown significantly (for 1995–2020, it increased by 5.1 percentage points, for 2010–2020 by 2.1 percentage points). At the same time, the share of regions with the highest level of provision decreased: Grodno, by 0.9 percentage points, Minsk, by 0.15 percentage points.

The dynamics of housing security of the population is influenced by many economic factors, including a study of the impact on this indicator of the level of GDP per capita and the level of housing stock per monetary unit of GDP.

This ratio can be represented as the following formula:

$$H = \frac{S}{GDP} \cdot \frac{GDP}{P},$$

where H – housing security,  
GDP – gross domestic product,  
S – housing stock (fund),  
P – population.

The change in housing security was analysed in the study using the index method, and the role of each of the factors was revealed.

The results of the analysis of the influence of factors on housing security for 1995, 2005, 2010 and 2019, are presented in Table 2.

**Table 2. Analysis of the influence of factors on the dynamics of housing security in the Republic of Belarus for 1995–2019**

Factors	Increase (+), decrease (-) in housing security due to factors		
	1995–2019	2005–2019	2010–2019
Housing stock level per unit of GDP, sq. m for 1 thousand US dollars	-68.7	-21.3	0.4
GDP per capita, thousand US dollars per person	76.8	26.2	2.8
Housing security, sq. m per person	8.1	4.9	3.2

Source: own development based on (National Statistical Committee. Official statistics, 2021; World development indicators, 2021).

The table shows that during all the periods under study, the increase in the level of housing security for the population was most influenced by the increase in GDP per capita. Moreover, both during the past 25 years (1995–2019) and over 15 years (2005–2019), this was the only positive factor. Moreover, only in the period 2010–2019, the second factor began to have a positive impact, the level of housing stock per unit of GDP (expressed in sq. m. per 1,000 US dollars). The contribution of the first factor (GDP per capita) amounted to 87.5% of the increase in the security of the population with housing, and the share of the second factor accounted for 12.5%.

As a result of study of the housing security for the population of Belarus, it was revealed that its level is affected by the influence of a number of regional differences (social, economic, natural, environmental, etc.):

- the difference in the economic and geographical position of agricultural regions in terms of soil fertility for the cultivation of certain agricultural crops;
- radioactive contamination of a significant part of the territory of the Gomel, Mogilev and some areas of the Brest, Minsk and Grodno regions;
- a higher level of development of energy- and metal-intensive industries in the Gomel, Vitebsk and Mogilev regions.

#### STATISTICAL STUDY OF THE DYNAMICS OF HOUSING SECURITY IN THE REPUBLIC OF BELARUS AND THE CIS COUNTRIES USING CLUSTER ANALYSIS

For a statistical study of the housing security of the population of the Republic of Belarus in territorial context (CIS countries), a cluster analysis was carried out between CIS countries, including the Republic of Belarus. It will allow assessing the similarities between the CIS countries.

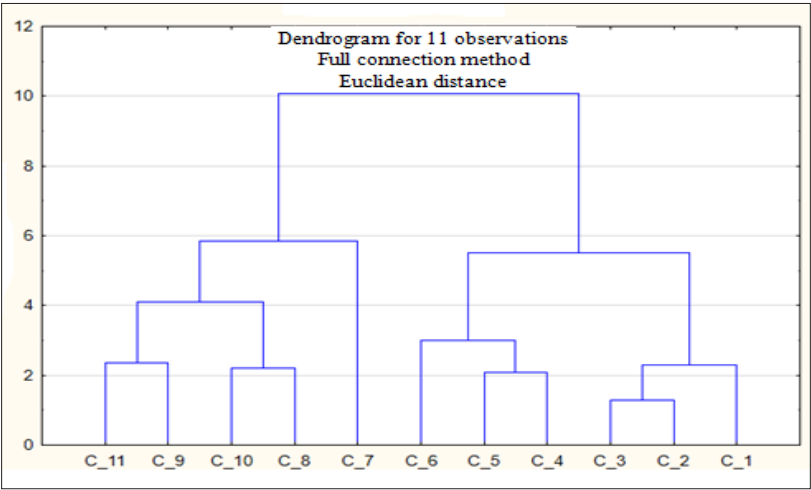
For the cluster analysis, the following indicators were taken (Table 3): housing security; the amount of the minimum wage; population size; gross domestic product per capita.

**Table 3. Indicators of the quality of life of the CIS countries, including housing security, 2019**

N/N	Country	Housing security, sq. m per capita	Minimum salary, US dollars	Population, thousand people	GDP per capita, thousand US dollars per capita
1	Tajikistan	10.9	41	9127.0	0.887
2	Kyrgyzstan	13.0	25	6389.4	1.33
3	Uzbekistan	15.8	24	33905.8	1.708
4	Azerbaijan	19.4	147	9981.5	4.809
5	Armenia	31.7	115	2965.3	4.621
6	Moldova	33.5	58	2681.7	4.475
7	Turkmenistan	19.9	226	6031.2	6.765
8	Kazakhstan	22.2	111	18395.7	9.796
9	Ukraine	24.2	177	41732.8	3.685
10	Russia	26.3	179	146780.7	11.581
11	Belarus	27.8	157	9475.2	6.67

Source: own development based on (*Housing stock and housing conditions...*, [http](#)).

As a result of clustering, the following was obtained: a dendrogram (Fig. 2), which graphically depicts the hierarchical structure generated by the similarity matrix and the rule for combining objects into clusters.



**Figure 2. Dendrogram of combining observations into clusters, 2019**

Source: own development based on (*Housing stock and housing conditions...*, [http](#)).

The horizontal axis represents observations and the vertical axis represents the union distance in this dendrogram. On the basis of the visual presentation



of the results, it can be assumed that the analysed group of countries forms two natural clusters.

This assumption was verified by the K-means method, while the significance of the difference between the resulting groups was investigated. Clustering by the K-means method showed significant differences for each factor ( $p < 0.05$ ).

The first cluster included the following countries: Azerbaijan, Armenia, Moldova, Kyrgyzstan, Tajikistan, Uzbekistan, and the second – Belarus, Russia, Kazakhstan, Turkmenistan, Ukraine.

The second cluster is distinguished by the presence of countries with a higher level of indicators in the aggregate that characterise the standard of living, among which is the provision of the population with housing.

## HOUSING CONDITIONS AS AN INDICATOR OF THE SOCIAL PROGRESS INDEX

The Social Progress Index is defined as the ability of a society to meet the basic human needs of its citizens.

This indicator measures social progress directly, without an economic component. It is based on real-life outcomes in the following areas: housing and food, rights, and education. 54 social and environmental indicators characterising the lives of ordinary people are measured for this. These indicators are divided into three main aspects of social progress:

- basic human needs – characterise how the basic needs of their people are met, their access to food, basic health care, drinking water, basic utilities, security;
- the basics of well-being – show citizens' access to basic education, knowledge and information, the possibility of a healthy lifestyle, and protection of the natural environment, which are important for existing and future well-being;
- opportunities – measures the accessibility of citizens to advanced forms of education, personal rights and freedoms necessary for the realisation of personal opportunities.

The Social Progress Index is an average of more than three dimensions.

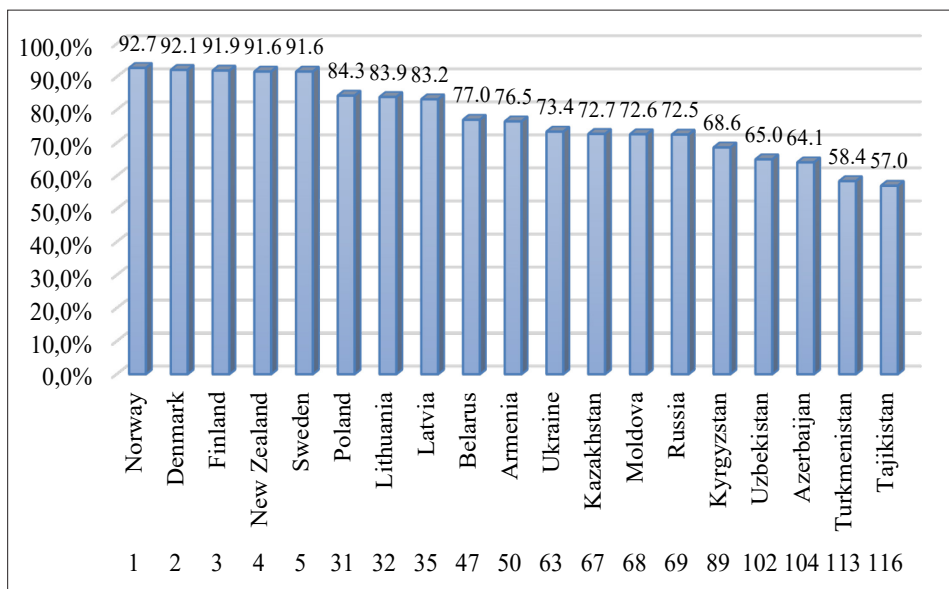
This indicator allows not only to obtain a cumulative rating of countries and to rank them, but also to identify strong and weak areas for solving urgent problems of social development of countries.

Housing security is one of the characteristics of the social progress index.

The ranking of countries according to the indicator of social progress is shown in Figure 3. For 12 consecutive years, Norway has been ranked first in the ranking, followed by countries such as Denmark, Finland, New Zealand, and Sweden.

Western neighbouring countries ranked higher in the ranking than Belarus as follows: Poland is in 31st place, Lithuania is 32nd, and Latvia is 35th. However, among the CIS countries, Belarus has the highest rating in terms of the social

progress index (47th place). The next, 50th place, is occupied by Armenia, Ukraine – 63rd place, Russia – 69th place. Tajikistan is in the last, 116th place in this rating (Social Progress Index rankings, [http](http://)).



**Figure 3. Ranking of countries according to the index of social progress, 2020**

Source: own development based on (*Belarus and the countries ...*, 2020).

The system of indicators reveals the relative strengths and weaknesses of the country in comparison with 15 similar countries with similar GDP per capita (for Belarus, these are the Maldives, Mexico, Serbia, Barbados, Uruguay, Thailand, etc.).

The indicator of housing conditions is one of the indicators of the first group: “Basic human needs (Section: Shelter)”. For Belarus, the average level of this indicator among the members of its group was revealed, 65th place in the world ranking.

Compare the ranking of the CIS countries (Fig. 3) with the level of housing provision of their population (Table 3). Obviously, the housing problem is the most pressing for the countries that are the last in the ranking of the index of social progress: Kyrgyzstan, Uzbekistan, Azerbaijan, Turkmenistan, and Tajikistan.

## CONCLUSIONS

The identified regional differences are due to the fact that the regions of the Republic of Belarus have a number of socio-economic, natural-geographical, and ecological features, which include:

- the difference in the economic and geographical position of agricultural regions in terms of soil fertility for the cultivation of certain agricultural crops;
- radioactive contamination of a significant part of the territory of the Gomel, Mogilev, and some areas of the Brest, Minsk, and Grodno regions;
- a higher level of development of energy- and metal-intensive industries in the Gomel, Vitebsk, and Mogilev regions.

The positive dynamics of housing security of the population in Belarus are associated with a number of social, economic, financial, and demographic factors:

- improving the standard of living of the population as a whole, increasing salaries;
- state support for citizens in the construction of housing, including the provision of gratuitous subsidies at the expense of the budget, soft bank loans, loans from organisations at the place of work for the construction of housing;
- provision of social living quarters;
- an increase in the creditworthiness of citizens,
- improvement of the housing construction lending system and etc.

The following factors and housing security have a negative impact on the dynamics of housing provision:

- housing shortage, including the lack of affordable and comfortable housing;
- inconsistency of the existing housing stock with the requirements for the consumer qualities of housing;
- a structural and regional problem associated with the uneven density of the distribution of citizens across the regions of the country and individual territories;
- imperfection of financial mechanisms, such as the system of housing construction savings and mortgages;
- the problem of the level of costs for housing and communal services.

Taking into account the peculiarities of the studied regions must be taken into account when developing the regional policy of the state. Regional policy is carried out in order to ensure sustainable development using a differentiated approach to the development of regions; it will be aimed at improving the socio-economic development of the living environment.

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### Summary

Housing is one of the core values that provide citizens with a sense of economic stability and security, as well as stimulate them to work productively. Housing is an important element of the quality of the living environment in Belarus. There is a problem in the republic of providing the population with comfortable and affordable housing.

The identified regional differences in housing security, both between countries and between regions within the country, are due to the fact that different territories have a number of socio-economic, natural-geographical and ecological characteristics, which include:

- within the country, this is the difference in the economic and geographical position of agricultural regions in terms of soil fertility for the cultivation of certain agricultural crops; radioactive contamination of certain territories of Belarus, the level of their development;
- the difference between the countries is explained by different levels of social and economic development of territories, living standards of the population, differences in the development of the banking and financial and credit spheres, the industry of the regions, information transparency of the housing sector, and a number of other factors.

This was confirmed using the index analysis of housing security of the population of the regions of Belarus and the cluster analysis of the aggregate of the CIS countries.

*Keywords:* housing security, quality of life, living environment, regional differences.

## **Bezpieczeństwo mieszkaniowe jako wskaźnik środowiska życia**

### *Streszczenie*

Mieszkanie jest jedną z podstawowych wartości, które zapewniają obywatelom poczucie stabilności i bezpieczeństwa ekonomicznego, a także stymulują ich do produktywniej pracy. Mieszkanie jest ważnym elementem jakości środowiska życia na Białorusi. W Republice istnieje jednak problem z zapewnieniem ludności wygodnych i niedrogich mieszkań.

Regionalne różnice w bezpieczeństwie mieszkaniowym zidentyfikowane zarówno pomiędzy krajami, jak i pomiędzy regionami w kraju, wynikają z faktu, że różne terytoria mają szereg wyróżniających cech społeczno-ekonomicznych, przyrodniczo-geograficznych i ekologicznych. Różnice te obejmują:

- w kraju jest to różnica w położeniu gospodarczym i geograficznym regionów rolniczych pod względem żyzności gleb pod uprawę niektórych roślin rolniczych; skażenie radioaktywne niektórych terytoriów Białorusi, poziom ich rozwoju;
- różnicę między krajami tłumaczy się różnym poziomem rozwoju społeczno-gospodarczego terytoriów, poziomem życia ludności, różnicami w rozwoju sfery bankowej i finansowej oraz kredytowej, przemysłem regionów, przejrzystością informacji w sektorze mieszkaniowym oraz szeregiem innych czynników.

Powyższe obserwacje potwierdziła analiza wskaźnikowa bezpieczeństwa mieszkaniowego ludności regionów Białorusi oraz analiza skupień agregatu krajów WNP.

*Słowa kluczowe:* bezpieczeństwo mieszkaniowe, jakość życia, środowisko życia, zróżnicowanie regionalne.

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