

**MAP SCHEME OF THE HOUSING FUND OF THE ZHYTOMYR REGION:  
QUALITATIVE AND QUANTITATIVE ANALYSIS**

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*The housing fund, as a concept, is a complex of interrelated indicators characterizing its condition. First of all, it is the availability of housing, that is, the amount of living space per person of the population. This also includes the total living area, the number of houses and apartments, and the equipment of the housing stock by types of terrain.*

*It is known that Ukraine has almost the lowest rate of housing security among European countries. It is about 29 m<sup>2</sup>/person while other countries have much higher housing affordability, ranging from 31,2m<sup>2</sup>/person (Estonia) to 66,3m<sup>2</sup>/person (Luxembourg). The reasons for this state of affairs in our country are the inefficient use of land within categories, the inaccessibility of housing for many segments of the*

*population, the lack of state programs for financing construction and lending housing, low wages, etc.*

*The goal of our research was to study the housing stock of the Zhytomyr region with further analysis of its condition.*

*Based on the results of the research, maps of the provision of housing for the urban and rural population in the sections of Zhytomyr region were constructed. The largest amount of living space per person was observed in Brusylivskiy, Ruzhynskiy, Popilnyanskiy and Narodytskiy districts (30–40 m<sup>2</sup>). Moreover, security in rural areas is somewhat higher than in urban areas. In our opinion, the reason for this is the lower population concentration in small settlements. Therefore, population size as a factor influencing the condition of the housing stock of Zhytomyr region is one of the main, but not the only factors.*

*It was also established that over the past 15 years, the average housing supply in the region increased from 23,3 m<sup>2</sup> to 28,3 m<sup>2</sup> per person, while the number of apartments and houses actually remained at the same level (968,1 thousand in 2005 and 974,4 thousand in 2020), and the population has decreased significantly. Therefore, the reason for the increase in the housing supply indicator is not the improvement of the quantitative and qualitative condition of the housing stock of the Zhytomyr region, but rather the decrease in the number of residents.*

*Along with the quantitative analysis, a qualitative analysis of the housing stock was also conducted. It has been established that housing equipment with plumbing, sewage, and hot water has increased by almost 50% over the past fifteen years, especially in rural areas. And in general, the qualitative characteristics of the housing stock in the Zhytomyr region are somewhat inferior to similar ones in Ukraine.*

**Key words:** *housing stock, Zhytomyr region, housing supply, rural area, urban area, housing stock equipment.*

**Relevance of research.** According to Article 19 of the Land Code, the lands of Ukraine are divided into nine main categories according to their purpose. One of them is land for residential and public development [3, p. 6]. They make up only 11.5% of all land in our country, but they play an important socio-economic role, as they are the spatial basis for placing the production and housing stock of Ukraine.

Important analytical indicators that make it possible to assess the state and prospects for the development of the housing stock are: the number of residential buildings and apartments by population center; provision of housing for one person; total area of residential buildings, area of emergency buildings, etc. [1, p. 214; 5]. The analysis of the structure of the housing stock is important today, as it allows to establish the rationality of land use within the settlement, the level of state policy in the field of urban planning and, accordingly, to take into account the identified features when planning the circulation of land for residential and public development of the relevant territory.

Despite the fact that housing issues have been actively researched in recent years, currently a large number of issues related to the housing stock of Ukraine as a whole and Zhytomyr region in particular remain unresolved and require additional study, which justifies the relevance of further research.

**Analysis of recent research and publications.** Ukraine is a European country. However, the economic indicators of the housing stock of our country differ significantly from similar ones in Europe [7, p. 91, 9–12]. The most important indicator that indicates an effective housing policy is the provision of housing for the population, that is, living space per person. Yes, in Ukraine this indicator is less than 29 m<sup>2</sup> and is one of the lowest compared to other countries. Among the former socialist countries, the highest housing availability is observed in Hungary (31,2 m<sup>2</sup>) and Estonia (29,7 m<sup>2</sup>). The average figure for European countries is within 40,0 m<sup>2</sup> per person. The leaders in providing the population with housing are Luxembourg (66,3 m<sup>2</sup>) and Denmark (51,4 m<sup>2</sup>) [8–12].

Also, other statistical data indicate a disappointing situation in the housing sector. In particular, it is known that about 54% of Ukrainian families live in overcrowded housing, while in France, Great Britain, etc., such a problem almost does not exist. Today, the share of buildings erected during the Soviet era is 70% of the total number, and about 11% of Ukrainians live in new housing [4]. Recently, the problem of providing housing in the country has only worsened due to the selection of new preferential categories of the population, therefore the chosen topic is relevant and requires detailing.

**The aim of the study.** The purpose of our research was to analyze the housing stock of the Zhytomyr region and determine the level of providing the population with housing, followed by displaying the obtained results on the map of our region by district.

The following tasks were selected to reveal the plowed topic of research:

- to analyze the dynamics of the housing stock of the Zhytomyr region during 2005–2020, taking into account the influence of the population and the number of housing units;
- to study the provision of housing in rural and urban areas by district of the region with the subsequent construction of a map scheme;
- assess the quality condition (equipment) of the housing stock of Zhytomyr region and compare it with the relevant indicators for Ukraine.

**Research materials and methods.** The statistical yearbook of the Zhytomyr region for 2020 served as the initial data of the analytical study [6]. To justify the content of the cartographic image, the method of analysis and synthesis was used, followed by the identification of the main factors influencing the object under study.

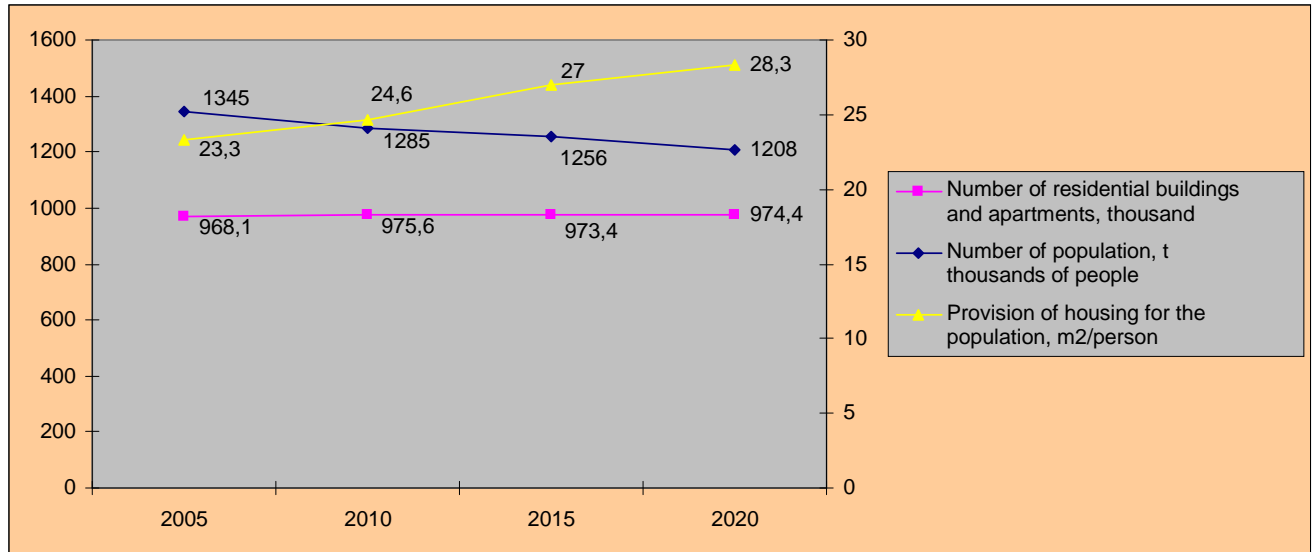
Maps of housing provision of the population in urban and rural areas were built in the Digitals program.

**Research results and their discussion.** It is known that the qualitative and quantitative composition of the housing stock of Zhytomyr Oblast, as well as in Ukraine as a whole, is characterized by a set of the following indicators: the total amount of

living space in urban and rural areas; equipment of the housing stock by types of terrain; the number of residential objects by district and city; dilapidated and dilapidated housing stock and, most importantly, the provision of housing for the population, which means the amount of living space per person of the population.

Analyzing the state of the housing stock of the Zhytomyr region in dynamics, we found that certain quantitative changes in some of its characteristics took place in the period from 2005 to 2020. Thus, we observe an increase in the provision of housing for the population (m<sup>2</sup> per person on average in rural and urban areas) from 23,3 m<sup>2</sup> to 28,3 m<sup>2</sup> over the past 15 years (Fig. 1). Opposite to this indicator is the population curve (thousands of people), according to which this indicator decreased from 1,345,000 to 120,800 people in the territory of the Zhytomyr region during the studied period.

Along with this, the amount of housing, including apartments and private houses in our region, has actually not changed in recent years and amounts to 974,400 as of 2020 (Fig. 1).



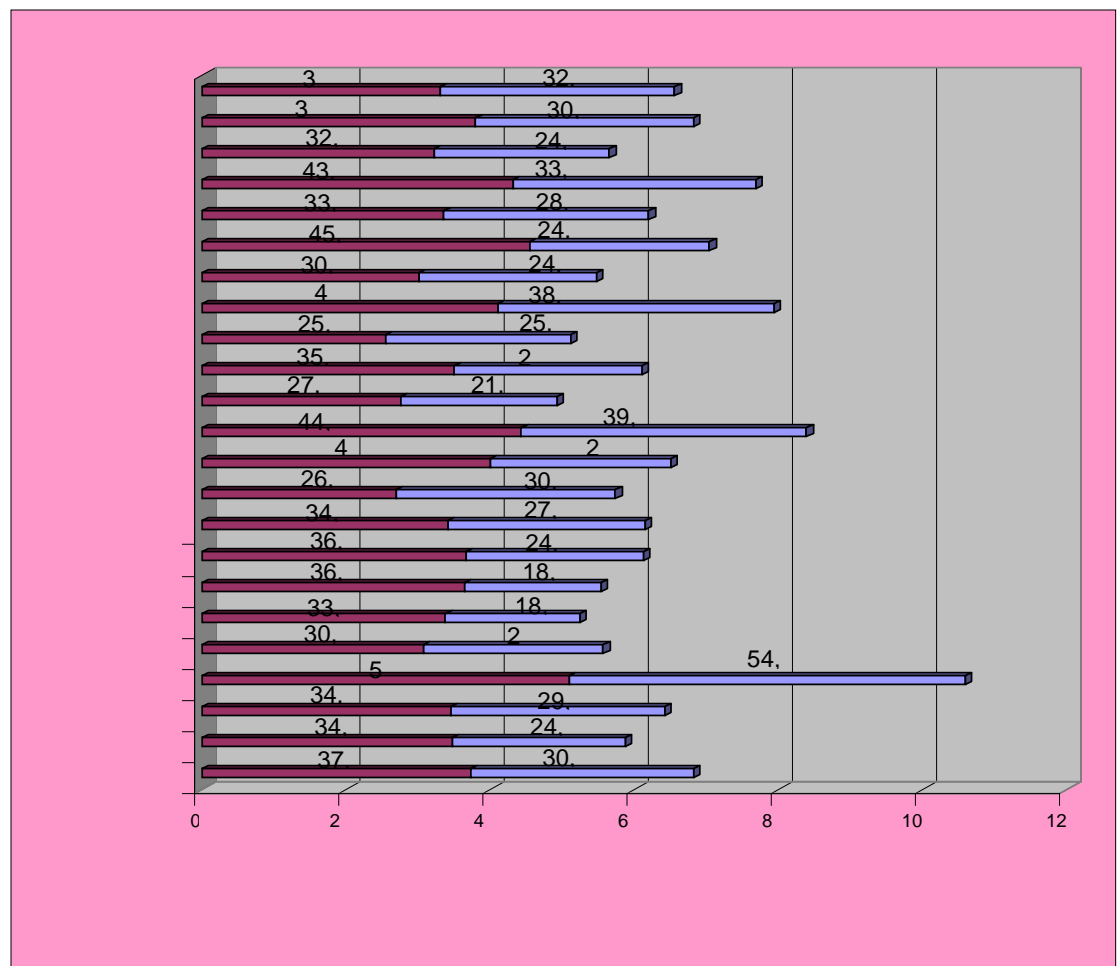
**Fig. 1. Dynamics of the housing stock of the Zhytomyr region by years (2005–2020).**

So, according to the study, the reason for the increase in the provision of housing for the population of the region is the decrease in the number of the population, and not

the increase in the number of housing due to new buildings. Such a trend is negative and requires adjustment in the way of land use planning within settlements.

We also studied the indicator of housing provision in urban and rural areas by district of Zhytomyr region. It was established that the number of dwellings per person in rural areas is significantly higher than in urban areas (Fig. 2). This is again explained by the lower population concentration in this area compared to the city. Industrially oriented cities with developed infrastructure are characterized by the problem of lack and inaccessibility of housing for many segments of the population.

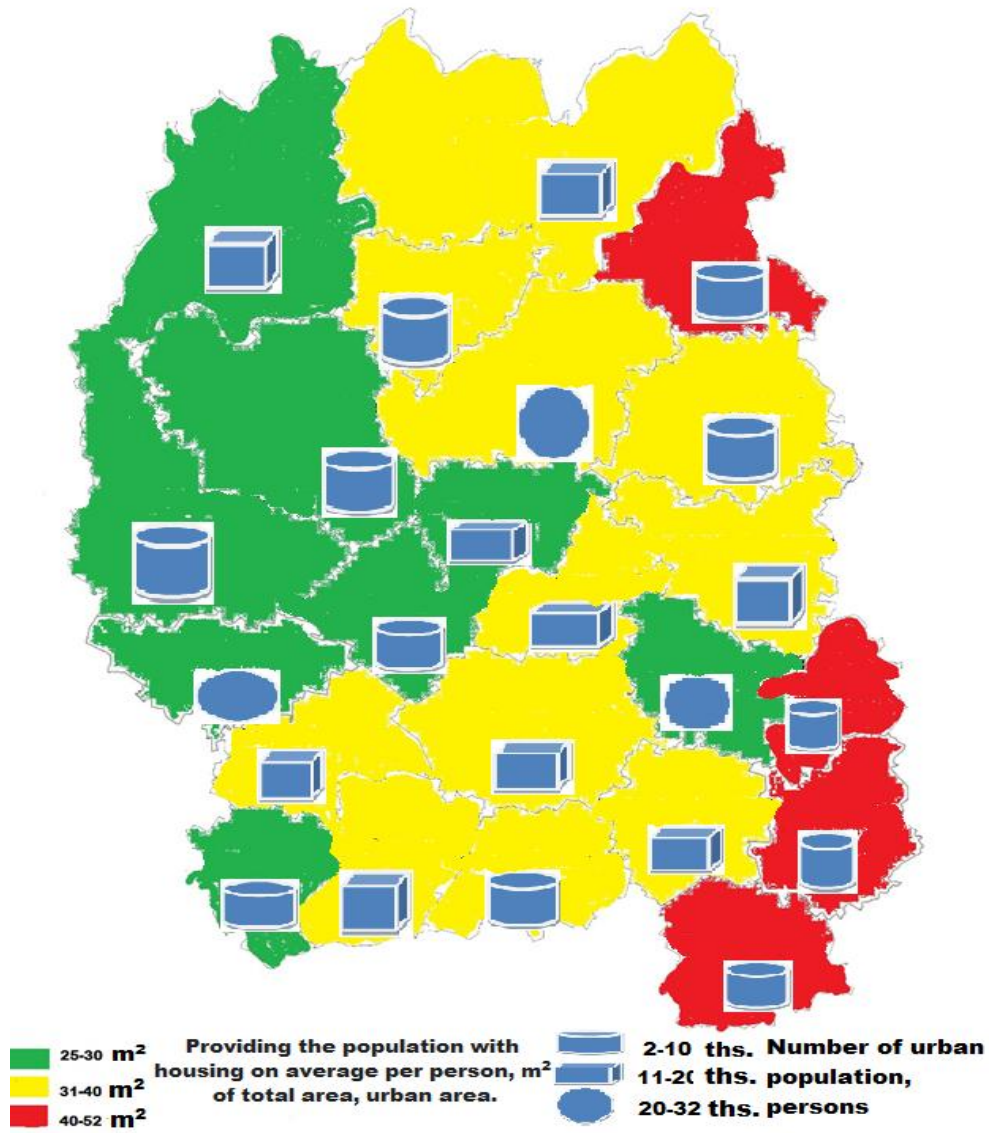
If we compare the regions of Zhytomyr region, the highest percentage of housing provision in rural areas is observed in Brusylivskiyi (51,0m<sup>2</sup>), Radomyshl'skiy (45,5m<sup>2</sup>), Narodyt'skiy (44,3m<sup>2</sup>), Ruzhyn'skiy (43,1m<sup>2</sup>) and Malin'skiy (40,0m<sup>2</sup>) districts. However, as mentioned earlier, such high indicators are caused by the outflow of the rural population due to low employment, and not by the improvement of the housing stock of these territories (Figs. 2, 4).



**Fig. 2. Provision of housing for the population by district of Zhytomyr region as of 2020.**

The best provision of housing for the urban population is characteristic of the following districts: Brusylivskyi ( $54,8\text{m}^2$ ), Narodytskyi ( $39,6\text{m}^2$ ), Popilnyanskyi ( $38,3\text{m}^2$ ), Ruzhynskyi ( $33,8\text{m}^2$ ), etc. (Figs. 2, 3).

Based on the results of the analytical study, a map scheme of housing provision of the population in the urban area was constructed (Fig. 3). According to it, the territory of the region was divided into three groups according to the area of available housing per person:  $25\text{--}30\text{ m}^2$  (low),  $31\text{--}40\text{ m}^2$  (medium), and  $40\text{--}52\text{ m}^2$  (high) (Fig. 3).



**Fig. 3. Map diagram of the urban population's provision of housing by state for 2020.**

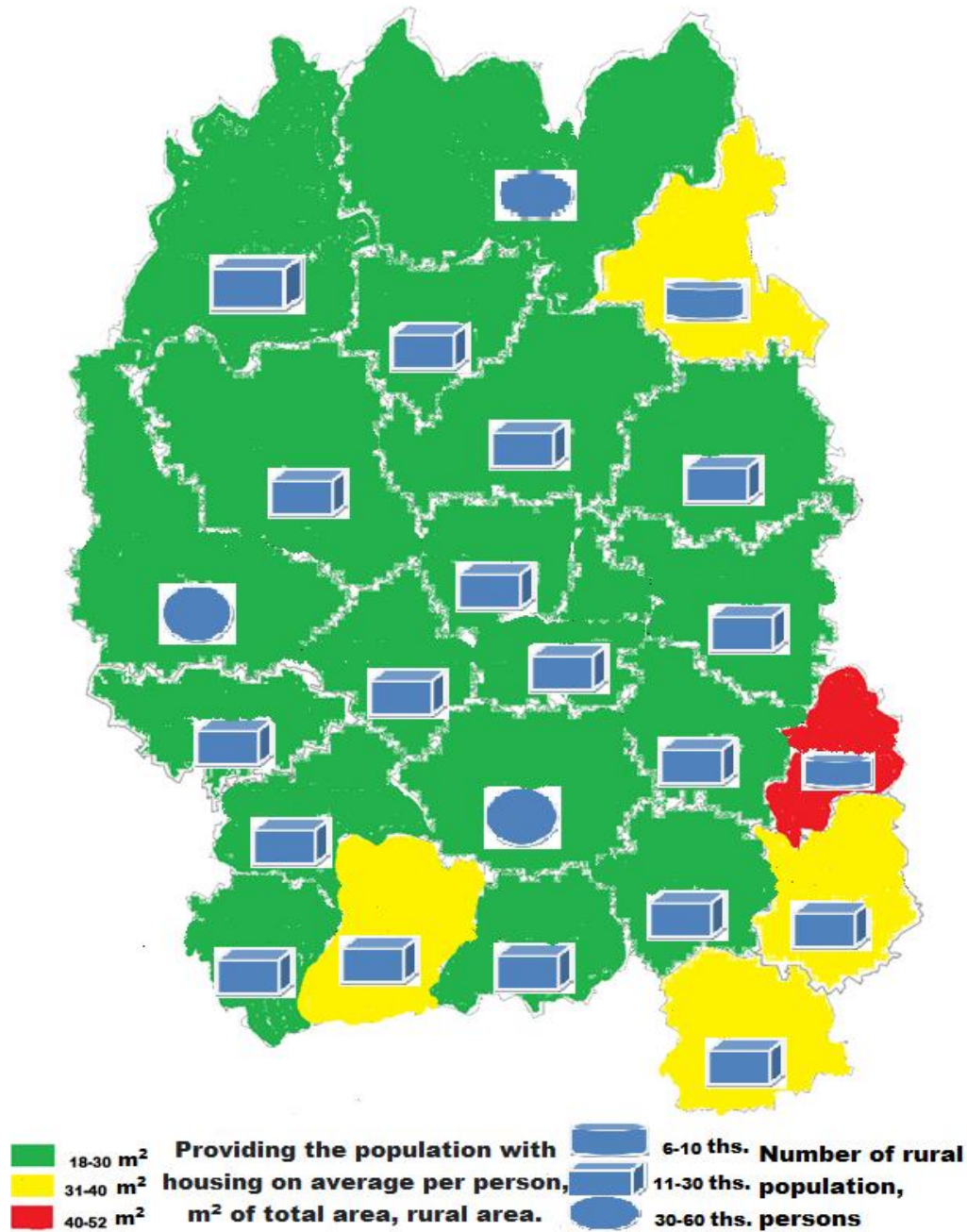
Also, when constructing the map, such a factor as the number of urban population in the studied territory was taken into account (except Zhytomyr and Berdychiv). However, we did not find a clear influence of the size of the urban population on its degree of housing provision. For example, the districts of Zhytomyr region, which were included in the group with the highest provision of housing for the urban population, had the smallest number of the corresponding population (2–10 thousand). However, such a number of the urban population was also typical for those districts that belonged



to the group of medium provision of housing (Malynskiy, Luhynskiy districts) and to the group with low provision (Novograd-Volynskiy, Yemilchynskiy) (Fig. 3).

As for the rural population, the districts where its number is the highest (30–60 thousand people), in particular Zhytomyr, Novograd-Volyn, Ovrutsky, belong to the category of rural areas with low housing provision (18–30 m<sup>2</sup>/person). Again, this category also includes those districts (they make up the vast majority in the region) where the rural population is 11,000 to 30,000 people. The smallest number of rural population is characteristic of Brusyliv and Narodyt'skiy districts, which have high and average housing availability, respectively (Fig. 4).

As a result of our research, the equipment of the housing stock in the rural and urban areas of the Zhytomyr region with water supply, sewage, heating, hot water supply and gas was analyzed in 2010-2020. As the results of the analysis show, a significant improvement in the condition of the housing stock took place in the period from 2010 to 2015. This especially applies to rural areas.



**Fig. 4. Map diagram of rural population's provision of housing by state for 2020.**

Thus, the number of houses within villages equipped with water supply (from 8,0 to 14,7%), sewage (from 7,5 to 14,6%), and hot water supply (from 4,1 to 10,7) increased by almost 50%. Over the past five years, these indicators have increased somewhat, but not significantly (Table 1).

## 1. The qualitative condition of the housing stock of the Zhytomyr region is dynamic

	2010		2015		2020		
	urban	rural	urban	rural	urban	rural	Ukraine Urban/rural
The specific weight of the living area, equipped (%)							
water supply	65,0	8,0	64,6	14,7	63,9	16,6	77,7/33,3
sewage	64,3	7,5	64,0	14,6	63,3	16,5	76,7/29,3
heating	61,6	22,7	62,3	99,8	61,7	99,5	79,2/94,7
разом	85,6	83,1	83,8	83,0	82,4	82,9	84,9/83,3
hot water supply	49,0	4,1	49,0	10,7	48,6	12,4	61,2/20,0

In general, the quality of the housing stock of the Zhytomyr region is somewhat inferior in all indicators compared to similar ones in Ukraine, both in rural and urban areas. A more significant difference is observed in the equipment of houses with water supply (16,6% in the region, 33,3% in Ukraine), sewage (16,5 in the region, 29,3% in Ukraine) and hot water supply (12,4% in the region, 20,0% in Ukraine). As for housing in urban areas, the difference in its equipment is insignificant with the average indicator for Ukraine.

**Conclusions and prospects for further research.** According to the purpose of the research, an analysis of the housing stock of the Zhytomyr region was carried out. It was determined that the level of provision of housing in rural and urban areas was not the same. In particular, all regions of the region are characterized by better housing provision, especially within small settlements. According to the results of the analysis and synthesis of the source information, maps of the provision of housing for the rural and urban population were constructed with the division of the territory into three groups of provision: 25–30 m<sup>2</sup> (low), 31–40 m<sup>2</sup> (medium) and 40–52 m<sup>2</sup> (high).

The studied dynamics of the housing stock of the region over the past fifteen years showed a significant reduction in the population of the studied territory and, accordingly, an increase in the number of housing units per person precisely thanks to this factor, because the number of houses and apartments during 2005–2020 did not actually change.

The level of equipment of the housing stock of the urban and rural population was analyzed. It was established that during 2010–2020 there was a significant improvement in living conditions in rural areas. This is evidenced by the increase in the specific weight of the residential area equipped with water supply from 8,0% to 16,6%, sewage – from 7,5% to 16,5%, hot water supply – from 4,1% to 12,4%. Despite such positive changes, the quality of housing stock in Zhytomyr region is somewhat inferior to the average for Ukraine.

### References

1. Hura, N.O. (2006). Accounting in the housing and communal economy: theory and practice [Oblik u zhytlovo-komunalnomu hospodarstvi: teoriya i praktyka]. Kyiv: Knowledge, 351.
2. Stupen, M.G. (2011). Land cadastre - the basis of regulation of land relations: monograph [Zemelnyy kadastr – osnova rehulyuvannya zemelnykh vidnosyn : monohrafiya]. Lviv: PE "Interprint-M", 306.
3. On the approval of the Classification of land use types. Available at: <https://zakon.rada.gov.ua/laws/show/z1011-10#Text>.
4. Year 2020 should be the year of a systemic breakthrough in housing policy: the report of the State Fund for the Promotion of Youth Housing Construction. Available at: <https://www.molod-kredit.gov.ua/pres-tsentr/novyny/2020-maie-staty-rokom-systemnoho-proryvu-u-zhytlovii-politytsi-serhii-komnatnyi>.
5. Safonov, Yu.M., Yevseeva, V.G. Housing sphere in Ukraine: state and development trends. *Efficient economy*. 2013. №6. Available at: <http://www.economy.nayka.com.ua/?op=1&z=2102>.

6. Pashinska, G. (2021). Statistical yearbook of the Zhytomyr region for 2020 [Statystychnyy shchorichnyk Zhytomyrs'koyi oblasti za 2020 rik]. Zhitomir, 455.
7. Fedoriv, P., Lomonosova, N. (2019). State housing policy in Ukraine: current state and prospects for reform [Derzhavna zhytlova polityka v Ukrayini: suchasnyy stan ta perspektyvy reformuvannya]. Kyiv: Analytical center CEDOS, 132.
8. Kees Dol, Marietta Haffner (2010). Housing statistics in the European Union 2010 (Statystyka zhytla v Yevropeys'komu Soyuzi 2010). Available at: <https://www.bmwfw.gv.at>.
9. Madden, D. and Marcuse, P. (2016) 'Introduction: The Residential Is Political'. In: Madden, D. and Marcuse, P. In Defense of Housing. The Politics of Crisis. Verso. URL: <https://commons.com.ua/en/zhitlove-ce-politichne>.
10. Vestergaard, H. and Scanlon, K. (2014) 'Social Housing in Denmark'. In: Scanlon, K., Whitehead, C. and Fernandez Arrigoitia, M. eds. Social Housing in Europe. Wiley-Blackwell
11. Watson, M. (2009) 'Planning for a future of asset-based welfare? New labour, financialized economic agency and the housing market'. Planning Practice and Research, 24(1): 41–56.
12. Whitehead, C. (2014) 'Financing Social Rented Housing in Europe'. In: Scanlon, K., Whitehead, C. and Fernandez Arrigoitia, M. eds. Social Housing in Europe. Wiley-Blackwell.

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**КАРТОСХЕМА ЖИТЛОВОГО ФОНДУ ЖИТОМИРСЬКОЇ ОБЛАСТІ:**  
**ЯКІСНИЙ ТА КІЛЬКІСНИЙ АНАЛІЗ**

*Житловий фонд, як поняття, відображається комплексом взаємопов'язаних показників, що характеризують його стан. В першу чергу, це забезпеченість житлом, тобто кількість житлової площі на одну особу*

населення. Сюди також відносять загальну житлову площу, кількість будинків і квартир та обладнання житлового фонду за типами місцевості.

Відомо, що Україна серед європейських держав має чи не найнижчий показник забезпеченості житлом. Він складає близько  $29 \text{ м}^2/\text{особу}$ . В той час як інші країни мають значно вищу житлозабезпеченість, в межах від  $31,2 \text{ м}^2/\text{особу}$  (Естонія) до  $66,3 \text{ м}^2/\text{особу}$  (Люксембург). Причинами такого стану речей в нашій державі є неефективне використання земель в межах категорій, недоступність житла для багатьох верств населення, відсутність державних програм з фінансування будівництва та кредитування житла, низький рівень заробітної плати тощо.

Метою наших досліджень є вивчення житлового фонду Житомирської області з подальшою оцінкою його стану.

За результатами досліджень були побудовані картосхеми забезпеченості житлом міського та сільського населення в розрізі районів Житомирщини. Найбільша кількість житлової площі на одну особу спостерігалася у Брусилівському, Ружинському, Попільнянському та Народицькому районах ( $30\text{--}40 \text{ м}^2$ ). Причому в сільській місцевості забезпеченість є децю вищою, ніж у міській. На нашу думку, причиною цього є менша концентрація населення саме в невеликих поселеннях. Тому чисельність населення як фактор впливу на стан житлового фонду Житомирської області є одним із основних чинників, проте не одноосібним.

Також встановлено, що за останні 15 років забезпеченість житлом в середньому по області зросла від  $23,3 \text{ м}^2$  до  $28,3 \text{ м}^2$  на одну особу поряд з тим, що кількість квартир та будинків фактично залишилась на одному рівні (968,1 тис. у 2005 році та 974,4 тис. у 2020 році), а чисельність населення суттєво зменшилась. Тому причиною зростання показника забезпеченості житлом є не покращення кількісного та якісного стану житлового фонду Житомирської області, а саме зменшення кількості проживаючих осіб.

*Поряд з кількісним, проводився також якісний аналіз житлового фонду. Встановлено, що обладнання житла водопроводом, каналізацією, гарячим водопостачанням зросло майже на 50% за останні п'ятнадцять років саме у сільській місцевості. А загалом у Житомирській області якісні характеристики житлового фонду децю поступаються аналогічним по Україні.*

**Ключові слова:** *житловий фонд, Житомирська область, забезпеченість житлом, сільська місцевість, міська місцевість, обладнання житлового фонду.*