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FEATURES OF DEVELOPMENT OF INDUSTRIAL CONSTRUCTION OF HOUSING IN THE CONDITIONS OF URBANIZATION

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Abstract: The article discusses the issues of housing provision for the population and the peculiarities of the development of industrial housing construction in the context of urbanization, and also proposes the use of modern methods of housing construction in Uzbekistan.

Key words: housing design solutions, project life cycle, socio-economic assessment, physical and moral depreciation of housing, industrial housing construction, prefabricated construction, professional software products, an integrated approach to design and construction, urbanization, consumer qualities of housing, affordable housing, housing comfort, housing services ...

摘要：文章讨论了城市化背景下的人口住房供应问题和工业住房建设发展的特点，并提出了在乌兹别克斯坦采用现代住房建设方法。

关键词：住房设计解决方案、项目生命周期、社会经济评估、住房的物理和道德折旧、工业住房建设、装配式建筑、专业软件产品、设计和建造的综合方法、城市化、住房消费质量、经济适用住房、住房舒适度、住房服务.....

The problem of providing the population with decent housing is a socio-economic problem of a global scale and its relevance is manifested in all countries of the world. The UN Guiding Principles on the Implementation of the Right to Adequate Housing notes that more than 1.8 billion people all over the world do not have adequate housing, and the number of people living in informal settlements has already exceeded 1 billion. At the same time, 15 million people are forcibly evicted every year, and about 150 million people are homeless. Note that in the UN Human Development Report 2019, Uzbekistan is classified as a country with a high level of human development. The resident

population of the Republic of Uzbekistan as of January 1, 2020 amounted to 33.9 million people, the housing stock - 536.8 million square meters, and the average level of housing provision per person was 16.0 square meters.

In developed countries, the housing stock accounts for 20 to 25% of the national reproduced wealth of the country. And if we consider all types of real estate, then this figure is 70-80%. It is obvious that the effective development of housing as a system that has a significant impact on housing services has an important and significant socio-economic significance. It also does not require proof that the quality provision of these services and the

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costs of their implementation largely depend on the design solutions of housing (for example, the presence of walk-through rooms, irrational configuration of rooms, and others dramatically reduce the quality of housing services).

Today, in the context of urbanization and innovative development of the world economy, there is an urgent need to study theoretical and methodological problems, issues of increasing the efficiency of housing construction, an objective socio-economic assessment of design solutions for residential buildings, taking into account their life cycle. In this regard, special attention is paid to scientific research aimed at reducing the negative impact of the discrepancy between the terms of physical and moral deterioration of residential buildings. The main values of these studies are aimed at providing the population with comfortable and affordable housing while reducing the total costs of construction and maintenance of housing throughout the entire life cycle of housing.

The state pays special attention to the development of housing construction and the operation of housing in Uzbekistan, since providing the population with housing is not only a cornerstone social problem, but also one of the mandatory attributes that determine and ensure human life.

Thus, the problem under study carries an important social burden, consisting in providing favorable conditions for the creation and development of the primary cell - the family. Ultimately, this is evidence of the high practical importance and relevance of issues related to providing the population with affordable and comfortable housing. Undoubtedly, the results of this study serve to fulfill the tasks of "further improving the living conditions of the population, especially young families, residents

of dilapidated houses and other citizens in need of improving their living conditions, ..." outlined in the Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No. UP -4947 "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan".

In modern conditions, prefabricated housing construction, carried out in the 1960s and 90s, causes fair criticism. They are expressed in the fact that the residential buildings of those years are extremely not expressive, that these houses have low heat-technical qualities and there are leaks at the joints. There are also comments on the insufficiently comfortable layout of the premises in these houses. The state policy in the field of housing construction is aimed at ensuring high social protection, this is reflected in many regulatory and legal documents aimed at increasing the rate of housing provision for the population [1,2]. For this, various measures are envisaged and implemented, including the development of mortgages, an increase in the efficiency of the construction complex, etc. [3,4]. При ретроспективном анализе этого вида полносборного жилья можно отметить, что возникновение и становление этого вида жилья в 60-х годах of the last century, in fact, was one of the achievements of domestic construction thought, since the construction of such residential buildings made it possible to drastically reduce the severity of the housing problem, to provide, in the rather difficult post-war years, comfortable housing for those times for former residents of barracks, communal apartments. The use of this type of housing construction by organizing a system of house-building factories made it possible to build up to 110 million square meters annually. m of housing.

Dialectically, the requirements for housing on the part of consumers are increasing quantitatively and qualitatively. 16 sq.m. per 1 tenant quite recently seemed to be an incomprehensible norm for Uzbekistan.

Housing requirements are increasing in connection with the development of society and productive forces. It should be noted that in our country a significant increase in the level of provision of the population with housing has been achieved against the background of a high birth rate.

Urbanization is an important area of effective development of the national economy. It, along with other urgent tasks, was reflected in the Address of the President of the Republic of Uzbekistan Sh. Mirziyoyev to the Oliy Majlis dated December 28, 2018. take action today, that is, the probability of a decrease in this indicator. " That is why the country has planned "the development of a State program to bring the level of urbanization in the country to 60 percent by 2030." In this regard, a corresponding decree of the President of the Republic of Uzbekistan was adopted [2].

In addition, in the Address of the President of the Republic of Uzbekistan it is noted that "at the same time, attention should be paid to the integrated development of not only the capital and regional centers, but also cities and towns in the regions. From programs for the construction of standard houses in rural areas, it is necessary to gradually move to programs for the construction of multi-storey buildings in cities and towns. The engineering and communication infrastructure must be developed in parallel with the construction of housing. "

Studies carried out at the Tashkent Institute of Architecture and Civil Engineering based on an analysis of a number of typical housing projects

have made it possible to establish that the temporary trend of increasing requirements for consumer quality (comfort) of housing is associated with an increase in the well-being of the population, the development of science and technology, and is sustainable [6].

The problem of providing the population with housing and the development of housing construction is taking place at the present time. In Uzbekistan, she proceeds from the fact that the country is undergoing a fairly stable process of urbanization of the population (in 2008, the urban population equaled the rural population). In recent years, the average annual population growth rate is on average 1.6-1.7%.

Another significant feature of the development of construction in the cities of Uzbekistan is that they are mostly located in areas of irrigated agriculture. At the same time, domestic urban development has a low density due to the low-rise buildings. Spreading of urban development has obvious negative sides, which consist in the stretching of communications, an increase in the time and money spent on the movement of urban residents.

The complexity of the preparation of construction sites in urban conditions consists in the need to demolish buildings, transfer utilities, and allocate housing in case of demolition of residential buildings.

Let's pay attention to the process of housing renovation, which began to be carried out in such a metropolis as Moscow. The most important feature of this process is the construction of multi-storey residential apartment buildings (20 and more storeys) to replace the demolished 5- and 9-storey prefabricated houses of the 60s and 70s. As a result, the winners are the residents of old houses who receive new apartments without additional financial costs, as well as the city

authorities who have received the opportunity to sell them into new apartments in rather prestigious areas. Note that at the same time, most of the old communications are preserved.

Construction in cities has its own characteristics. The high price of land plots within cities, especially in the central regions of large cities, leads to the following consequences: the need for the construction of multi-storey buildings, the tightening of requirements for the construction time. In addition, it is the reason for the cramped construction sites.

The complexity of urban construction projects comes from their multi-storey structure (for most objects), a high degree of equipment with utilities. In addition, it is during the construction of urban facilities that new constructive solutions and building materials are used. Also, the complexity of urban construction projects means an expanded group of construction participants - subcontractors.

The tightening of requirements for the construction time is an objective condition set by investors who are interested in accelerating the return of the allocated significant funds.

In many foreign megacities, the lack of space for the location of on-site warehouses and other temporary buildings and structures, areas for the installation of construction equipment significantly complicates the organization of construction and leads to the need to use innovative construction methods and new construction machines and mechanisms.

In foreign practice, several hundred highly specialized construction companies are often involved in the construction of the complex. A clear connection of performers is ensured by high contractual discipline, supported by strict sanctions against violators of the terms and quality of work.

The intensive development of cities in Uzbekistan is accompanied by a relatively high birth rate and a high proportion of children and adolescents in the population structure. The main factor in the growth of the urban population is the industrialization of the economy.

The peculiarity of urbanization in Uzbekistan is that the growth of the urban population is mainly due to large cities. Since the first years of independence, state policy has been to provide broad and targeted support to the rural population (transferring land to families for their own needs, maintaining high rates of construction of water supply networks in rural areas, gasification of villages).

In modern conditions, housing, along with traditional functions, as a result of the development of processes inherent in the post-industrial period, is designed to perform additional, qualitatively new functions, including: providing conditions for maintaining a high educational level, harmonious development of its inhabitants.

In modern conditions, solving the problem of providing the population with housing requires a systematic approach that takes into account the state of housing construction and the existing housing stock, the growth of requirements for living conditions.

I would like to draw your attention to the statistics of housing construction in the context of the number of storeys (Table 1).

Based on this, economic considerations lead to the need to improve the concepts of urban development and housing construction, in particular. It can be noted that in modern conditions, the density of development in city centers, especially large ones, has grown, mainly due to the construction of business centers, office buildings and other civil and residential facilities.

It should be noted that an example of a positive development of urban development is the construction of the Tashkent City international business center in the central part of Tashkent city, as well as Olmazor Business City, Yunusobod Business City and many other projects provide for the construction of multi-storey residential buildings.

The data in Table 1 indicate the presence of a stable trend in the growth of housing construction volumes. At the same time, the low specific gravity of the construction of multi-storey housing (5 or more floors) is alarming, since this is reflected in a decrease in the density of residence in cities and leads to an extension of communications and an increase in the rejection of irrigated land for residential development, since most of the settlements are located in oases ...

It should be noted that thanks to the efforts of the head of state to provide the population with housing over the past three years, the share of housing construction in 2019 (from 5 and more) increased almost 4 times compared to 2018.

The need to increase the provision of housing in cities and the demolition of outdated housing gives rise to new methods, among which renovation has great prospects. The experience of housing renovation, which is being carried out in such a metropolis as Moscow, deserves a deep analysis. The most important aspect of this process is the construction of multi-storey residential apartment buildings (20 and more storeys) to replace the demolished 5 and 9-storey prefabricated houses of the 60s and 70s.

Table 1
Distribution of residential buildings
by number of storeys
(new construction, thousand sq.m. total area)

Years Number of storeys residential buildings	2015	2016
Residential buildings, total, including:	11 488,2	10 962,1
1-part	10 723,8	10 047,0
2-part	646,1	625,3
3-part	10,3	200,0
4-part	85,8	71,7
5-part and higher	22,2	18,1

As a result, the winners are residents of old houses, who receive new apartments without additional financial costs, as well as city authorities, who have received the opportunity to sell new apartments in rather prestigious areas. Note that at the same time, most of the old communications are preserved.

The peculiarities of construction in cities are based on the high price of land plots within cities, especially in the central regions of large cities, which leads to the following consequences: the need for the construction of multi-storey buildings, tightening requirements for construction time. In addition, it is the reason for the cramped construction sites.

It should be noted that now in Uzbekistan, unlike other CIS countries, standard projects are widely used in this type of construction. Let us explain this by the fact that the use of such projects is planned in the Russian Federation, since a square meter of housing in Petrozavodsk (Kola Peninsula) is much more expensive than in a similar residential building built in neighboring

Finland. A similar situation takes place in other regions of this country (for example, in Blagoveshchensk compared to Chinese cities on the other side of the Amur River).

These judgments are not unfounded, since there are vivid examples proving that prefabricated construction is at a new stage, that in modern conditions the use of new technologies significantly reduces the previously existing disadvantages. In general, this concept of the revival of prefabricated housing construction has an explanation from the standpoint of dialectical development.

In industrialized countries in urban construction, these reasons lead to the need to apply the method of "mounting from wheels". The essence of the method lies in the fact that all prefabricated elements are delivered to the construction site according to an hourly or minute schedule in a strict technological sequence and are transported by a crane directly to the place of their installation. At the same time, the object warehouse is designed for small-piece elements that make up 10-15% of the number of elements required for a floor. This method has certain advantages, which consist in a decrease in the number of loading and unloading, in a reduction in construction time, in an increase in the safety of products, in a more efficient use of assembly equipment [7].

Taking into account all the above factors, the most important condition for urban construction is a short time frame for the construction of facilities. This fully applies to housing construction. Tight and tight construction terms in cities are an objective reality. For example, the protracted construction of transport facilities (overpasses, overpasses, etc.) leads to chronic congestion ("traffic jams"), complicates the movement of transport, leads to an increase in the

number of people traveling and, ultimately, leads to additional costs. All this leads to the fact that the construction of apartment buildings in cities should be carried out by industrial methods, that is, using prefabricated elements that allow for high rates of construction.

These judgments are not unfounded, since there are vivid examples proving that prefabricated construction is at a new stage, that in modern conditions the use of new technologies significantly reduces the previously existing disadvantages. In general, this concept of the revival of prefabricated housing construction has an explanation from the standpoint of dialectical development.

These examples can and should include the activities of the diversified design and construction Russian group "PIK", which is engaged in the complex construction of residential areas (microdistricts) in a number of cities, including Moscow. The production capacity of this corporation makes it possible to build annually 1.1 million square meters of multi-storey (20 and higher floors) housing, with an average area of one apartment of about 70 square meters. m. The residential development put into operation provides a sufficiently high degree of housing comfort and the architectural expressiveness of residential areas. Various innovations have been used in the production, including planning solutions for areas that provide a favorable landscape environment.

Concerning the main disadvantage of industrial housing construction - the low heat-technical qualities of the enclosing structures, it is completely eliminated by the use of three-layer structures that ensure compliance with modern standards in terms of thermal protection.

Thus, the given data indicate that multi-storey buildings erected using prefabricated reinforced

concrete structures should prevail in urban residential development. It also shows that in the context of urbanization, the life cycle of products such as precast concrete products and structures will not have a decline in demand, moreover, with the growth of urbanization, a steady upward trend in demand for innovative products of precast enterprises is expected. This is evidenced by the experience of many developed countries and the examples discussed in the article.

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