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Organizational forms of updating
the management structure of urban real
estate cluster territories in Donbass

The paper raises the issues of ensuring the sustainable development of the urbanized border territories of Donbass, as well as the main problems standing in the way of achieving the restoration of reproduction in the housing sector. The features of managing the restoration processes of spatial and resource development of housing stock in new regions are considered. Special attention is paid to substantiating the classification features of the organizational and economic mechanism of renewal, taking into account the options for territorial cluster portfolios of real estate. The urban development of the historical center of Mariupol was chosen as an example for consideration. A detailed analysis of the factors of resilience and life support of urban real estate, approaches to the formation of adaptation mechanisms for carrying out repair and restoration work has been carried out. Functional areas such as regulation of investment and innovation potential, introduction of socio-economic, environmental and informational changes, design and scenario modeling, analysis of the sustainability of spatial resource development and housing revitalization solutions, as well as urban renewal, are highlighted. A structural model of spatial and resource development of the housing stock in Mariupol has been formed, which will improve the investment attractiveness and ensure flexible planning of repair and restoration work.
Keywords: sustainable development, organizational forms of management, cluster territories, urban real estate, revitalization, restoration of housing reproduction

INTRODUCTION

The sustainable development of the liberated urbanized territories of Donbass is associated with the use of modern scientific approaches to the rational use of regional factors to increase efficiency and intensify the construction industry. Therefore, a comprehensive consideration of the issues of updating organizational forms of management is an urgent problem of improving the economic mechanism of municipal authorities, combining the mechanisms of sectoral and territorial planning^{1, 2}.

The development of forms of production organization in the construction sector reflects the industrial and technological specialization of the Donetsk region, related to the functional structure of the Donetsk-Makeyevka industrial agglomeration and Kramatorsk-Slavyansk, Krasnoarmeysky, Gorlovsko-Yenakiyevsky, Torezo-Snezhnyansky and Mariupol industrial districts [1]. Territorial division of labor, spatial and resource development is the basis for restoring the reproduction of housing stock through the creation of cluster associations, which are designed to promote the innovative and investment development of engineering and construction life support systems for urban real estate [2].

The scientific, methodological and practical orientation of the cluster-territory renewal problem has determined the main purpose of the work — the systematization and substantiation of methodological provisions and organizational and economic mechanisms for managing aggregate resources during construction and restoration work.

Improving the theory and practice, technology and organization of repair and restoration work requires consideration of the following tasks:

- to analyze the specifics of managing the restoration processes of spatial and resource housing development in new regions;
- to formulate the classification features of the organizational and economic mechanism of renewal, taking into account the options for territorial cluster portfolios of real estate (TCPR_i);
- to develop the provisions of problem-oriented management of repair and restoration works based on the matrix of scenarios of cluster-territories of development.

Taking into account the distinctive factors of resilience and life support of urban real estate in TCPR_i, approaches to the formation of adaptation mechanisms for carrying out repair and restoration work are based on common signs of housing stock reproduction:

- continuity of the process of sustainable housing renewal throughout the life cycle of buildings;
- maintaining performance and durability to prevent physical and moral deterioration;
- continuous improvement of the quality of the residential environment and urban infrastructure.

¹ Strategy for the development of the construction industry and housing and communal services of the Russian Federation for the period up to 2030 with a forecast up to 2035. URL: <https://sudact.ru/law/rasporiazhenie-pravitelstva-rf-ot-31102022-n-3268-r/strategiia-razvitiia-stroitelnoi-otrasli-i/> (date of access: 02/15/2024).

² The State programme "Restoration and socio-economic development of the Donetsk People's Republic, Lugansk People's Republic, Zaporizhia region and Kherson region". URL: <https://нострa-новление-правительства.рф/gosudarstvennaya-programma-vosstanovlenie-i-sotsialno-ekonomicheskoe-razvitiie-donetskoj-narodnoj-respubliki-luganskoy-narodnoj-respubliki-zaporozhskoj-oblasti-i-hersonskoj-oblasti/>

When considering the organizational and economic mechanism for the implementation of real estate reproduction processes, such functional areas are highlighted as: regulation of investment and innovation potential; making changes of a socio-economic, environmental and informational nature; design and scenario modeling; analysis of the sustainability of solutions for spatial resource development, renovation, redevelopment and revitalization of housing and the urban environment [3].

MATERIALS AND METHODS

The fundamental provisions and principles of system analysis and process approach, business continuity, real estate management, special methods of modeling the life cycle of capital construction facilities, economic theory, cybernetics, anti-crisis management of construction and housing rehabilitation, emergency situations and disasters are used to scientifically substantiate the organizational forms of updating the urban real estate management structure.

Emergency recovery operations in the aftermath of natural and man-made emergencies provide for a complex of emergency rescue operations, which, depending on the time of their implementation and complexity, include the stages of urgent and priority emergency recovery operations³.

The restoration of the housing stock is carried out after the completion of design work, as a rule, in parallel with emergency recovery work and resource provision, supplies of the required mechanisms and materials. Depending on the factors of resilience and life support of urban real estate, there are three types of housing rehabilitation: short-term, temporary, and capital.

Modern literary sources reveal diverse aspects of organizational and technological preparation of reproduction processes in the housing sector: the economic essence and features of the manifestation of various forms of reproduction [4]; analysis of the organizational and technological reliability of emergency facilities in conditions of spatial and temporal uncertainty, the development of means and methods of organizing information support for adaptive and operational management processes [5, 6]; principles of organizational and managerial activities in carrying out construction and restoration work carried out in emergency situations and under martial law [7]; a special mechanism for managing balanced indicators of housing stock reproduction [8]; programmatic approaches to the reproduction and restoration of residential facilities in the Donetsk People's Republic [9]; sustainable development of urban areas in the presence of threats from modern man-made societies [10]; requirements for residential areas with signs of significant physical and moral deterioration of buildings and structures during the implementation of renovation programmes [11]; the use of innovations, the use of new materials, structures, equipment, technologies, design developments, modern methods of organization in the management of repair work during the reconstruction and modernization of dilapidated housing [12].

The capabilities of construction organizations make it possible to restore buildings, but the specifics of emergency recovery work require an increase in the organizational and technological level, the effectiveness of investment decisions to restore the reproduction of urban real estate [13]. The current level of TCPR, renewal is achieved on the basis of problem-oriented management through

the implementation of combined spatial and resource development measures.

The hierarchical subordination of the reproductive processes of new construction, modernization, reconstruction, renovation, revitalization and redevelopment is built depending on the integral indicator of the effectiveness of cluster-territories of development, taking into account:

- *technical* aspect of all options for the reproduction of real estate and housing and communal infrastructure;
- *technological* aspect of the qualitative change in the communication characteristics of the territories of the current development (including communications for the provision of all types of resources used in the operation of housing stock, transport communications, service communications for various types of public utilities);
- *organizational* aspect of the formation and subsequent functioning of management structures, ensuring the effectiveness of the regime for the use of residential real estate, complexes of facilities, territories and, ultimately, the city as a whole;
- *economic* aspect of the cost assessment of life processes and management;
- *social* aspect of constraints in the implementation of specific renovation projects.

Thus, the restoration of the viability of urban spaces is achieved by ensuring a balanced functional structure of real estate and the biospheric compatibility of urbanized territories with transport and communal infrastructure facilities. The processes of restoration of housing stock reproduction include urban planning, regulation and arrangement, organizational and technological development and resource provision of enterprises of the construction complex.

The elimination of the imbalance in the urban development of new territories during the transition period is associated with the implementation of the principles of complexity, long-termism, security, and integration in the format of a macroregion with a single development strategy [14].

RESULTS

Restoration of housing stock reproduction and its long-term effective use is impossible without the implementation of problem-oriented management and organizational and technological preparation of state support measures in accordance with Federal Law No. 224-FZ dated July 13, 2015 "Public-Private Partnership in the Russian Federation and Amendments to Certain Legislative Acts of the Russian Federation" (hereinafter referred to as the Law on PPP).

Since the beginning of hostilities in the territory of the Donetsk People's Republic, more than 800 thousand real estate objects have been registered, among which more than 40 thousand buildings have been destroyed. Records of all destroyed housing stock facilities are maintained by local administrations in accordance with the mechanism for conducting damage surveys, assessing the criticality and extent of damage to housing stock, identifying recovery opportunities, required resources, and the need to build new housing.

According to the data of the public law company "Unified Customer in the field of construction", which performs the functions of a state customer in the framework of ensuring the construction of civil facilities, the housing rehabilitation programme in Mariupol has been completed by 90 %. The next step is to work on historical sites

³ Main directions and issues of organizational and technical preparation of design and construction organizations for emergency recovery operations. Developed by: Moskomarkhitektura; GUP NIATs; GUP EkinTS. Moscow, Moskomarkhitektura, 2004. URL: <http://libnorm.ru/Files1/42/42313/index.htm> (rus.).

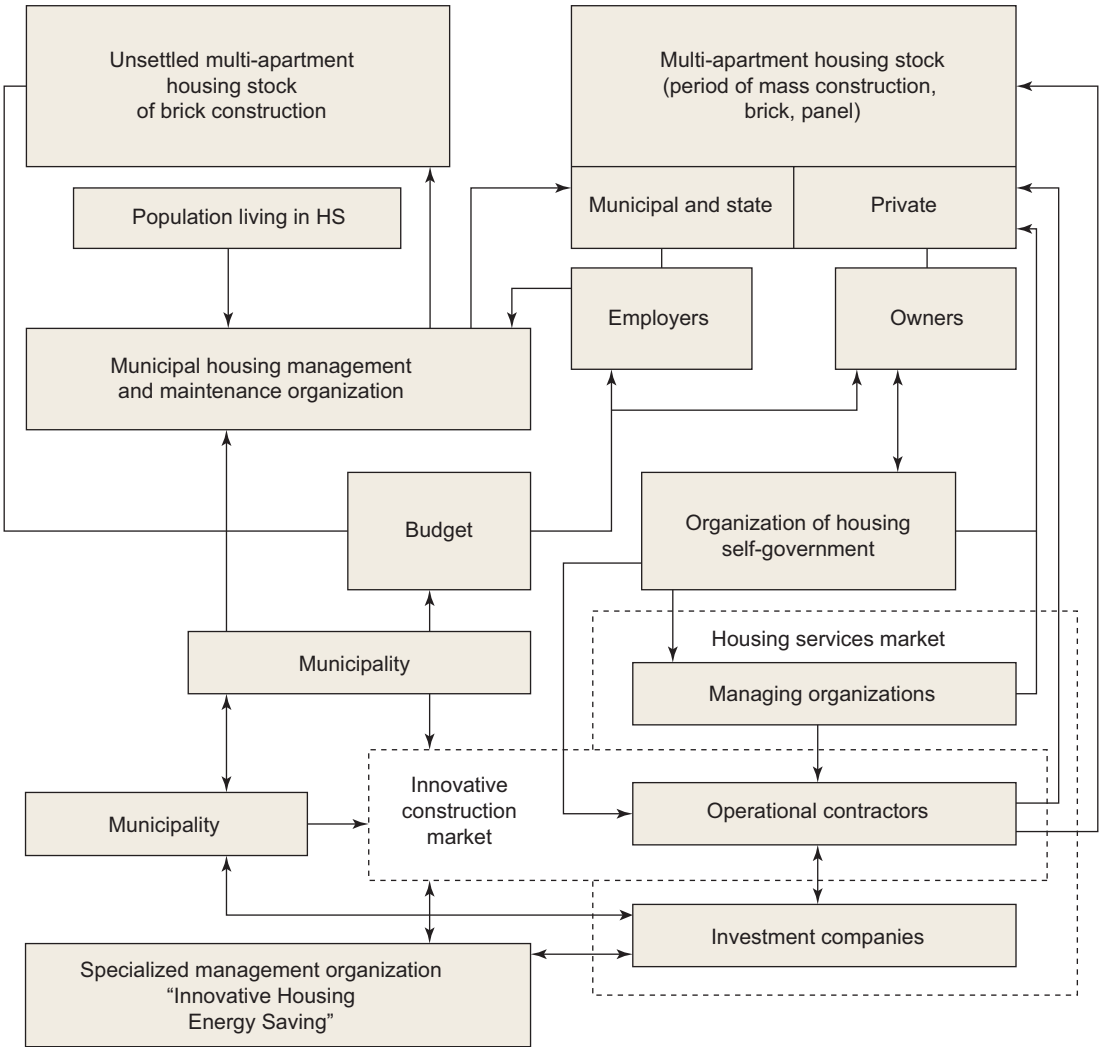


Fig. 1. The structural model of management of restoration processes of spatial and resource development of housing stock in Mariupol

and buildings with a high degree of destruction⁴. Thus, the completion of the stage of urgent and priority emergency recovery work opens up new opportunities for restoring the reproduction of housing stock and updating the quality of the urban environment.

Based on the analysis of the state and problems of developing organizational and economic solutions during construction and restoration work, a functional typology is proposed that allows both taking into account the level of socio-economic development (in terms of the isolated influence of external factors) and positioning the territorial organizational and economic cluster depending on the degree of development of the housing sector (Fig. 1). This typology allows us to evaluate and adjust the direction of development of the organizational and economic cluster-the territory of historically developed buildings within the city of Mariupol, taking into account the socio-economic principles of real estate revitalization in the structure of the urban economy (crisis, liberal and innovative territories).

Scenarios for choosing development directions in the territory of a historically established territorial multifunctional complex (TMFC) provide for consideration of socio-market, evolutionary-breakthrough, as well as innovative options for continuous improvement

of the quality of housing stock and urban renewal. Due to the impossibility of solving all problems simultaneously within the framework of the cluster approach, an organizational and economic territory is being formed — a cluster of existing buildings, which provides for the implementation of priority investment and innovation projects within the framework of the municipal strategy for the establishment and functioning of territories historically part of Mariupol.

Let's consider the main options for the development of cluster territories when investing in the revitalization of real estate in the historical part of the city (Table 1).

The choice of priority options for restoring urban real estate reproduction is determined by the classification of investment attractiveness (very high, high, medium, satisfactory, low), taking into account the industrial and technological specialization of the region. Thus, the choice of a cluster-territory development scenario is influenced by the investment attractiveness of both the region and the city, with the allocation of basic scenarios. The difference between the proposed management models of TCPR_i is the application of a problem-oriented approach that takes into account the conditions for restoring the reproduction of housing stock in a complex emergency situation.

⁴ URL: <https://realty.ria.ru/20250130/mariupol-1996106808.html>

Table 1. Typology of cluster territories by state of TCPR_i

Variants of territorial cluster real estate portfolios	City types		
	A. Innovative	B. Evolutionary breakthrough	C. Socio-market
I. Innovative	Innovative city (IA)	Innovative city (IB)	Evolutionary breakthrough (IIA)
II. Evolutionary breakthrough	Innovative city (IC)	Evolutionary breakthrough (IIB)	Socio-market (IIIA)
III. Socio-market	Evolutionary breakthrough (IIC)	Socio-market (IIIB)	Socio-market (IIIC)

Table 2. Matrix of optimal costs (C_{ad,i}) for rebuilding options of urban real estate revitalization

Revised (i-th) option	Option (γ-th), for which the revitalization is performed						
	I	II	III	...	γ-th	...	m
I	0	C ₁₂	C ₁₃	...	C _{1γ}	...	C _{1m}
II	C ₂₁	0	C ₂₃	...	C _{2γ}	...	C _{2m}
III	C ₃₁	C ₃₂	0	...	C _{3γ}	...	C _{3m}
...	...	...	...	...	...	...	...
i	C _{i1}	C _{i2}	C _{i3}	...	C _{iγ}	...	C _{im}
...	...	...	...	...	...	...	...
m	C _{m1}	C _{m2}	C _{m3}	...	C _{mγ}	...	0

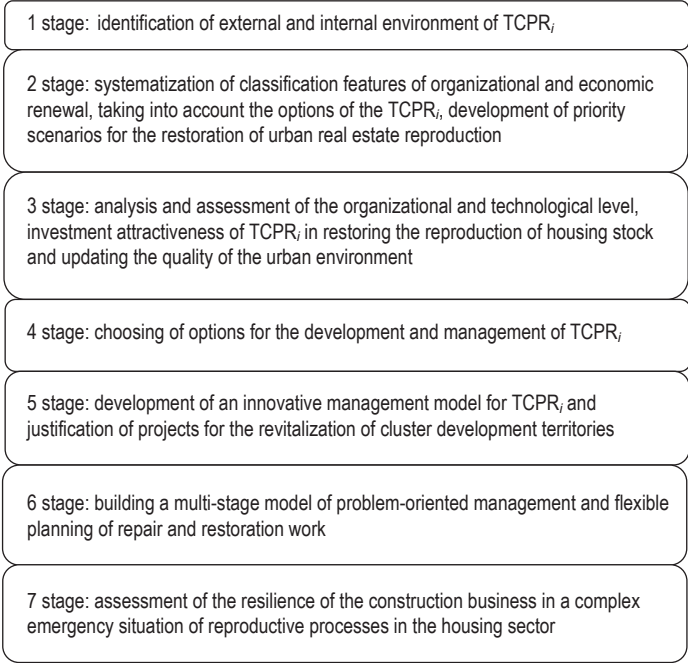


Fig. 2. The stages of programme-oriented management of a territorial cluster in the restoration of urban real estate reproduction

Priority revitalization options are analyzed taking into account the matrix of optimal costs for rebuilding options (C_{ad,i}), criteria of manufacturability, reliability, availability of resources, volume of reconstructive solutions, etc., which makes it possible to adapt design preferences in conditions of uncertainty of post-crisis recovery (Table 2).

A characteristic feature of the procedures for assessing priority megaprojects is the much greater role of various natural and resource indicators than in other cases, which sometimes dominate the cost. There are two reasons for this. Firstly, the cost indicators for the future are predicted with a lower degree of probability, while the resource base has a reliable description in physical terms. Secondly, the prospect of large-scale megaprojects often depends on the availability of significant required resources. The assessment of their size and the possibilities of their real provision is becoming a priority and critical aspect for regional municipal authorities.

Thus, the proposed typology according to the state of the TCPR_i and the level of their socio-economic development made it possible to develop classification features of scenarios for the development of cluster territories (see Table 1, 2). The matrix model shows 9 variants reflecting the type of territory historically developed in the city, depending on the level of socio-economic development and the state of the TCPR_i. At the same time, each option has its own composition of possible development scenarios.

The developed typology of cluster territories according to the state of TCPR_i (see Table 1) and the formed cost matrix of urban real estate revitalization options are adapted for spatial and resource development and management of the resilience of the construction business in a complex emergency situation in order to sustainably reproduce urban real estate and attract investment funds and innovative materials and technologies (Fig. 2).

The application of the developed methodology made it possible to gain competitive advantages by substantiating the investment attractiveness of historical buildings in the urbanized territory of Mariupol:

- urban planning — creation of a new public space;
- social — creation of new jobs, a multifunctional center that includes hotel, office, shopping, cultural, entertainment and residential functions as a result of the relocation of production;
- functional and economic — increasing the competitiveness of a territorial object in the real estate market by creating new points of attraction for human flows;
- environmental — reduction of pollutant emissions, as well as reduction of noise impact from production facilities;
- cultural and historical — preservation and development of valuable urban territory by preserving the history of objects;
- engineering and technical — reducing the negative impact of the facility's activities on transport and engineering networks, as well as eliminating the depressive state of the surrounding buildings; arrangement of underground and aboveground parking lots.

CONCLUSIONS

In the current conditions of a complex emergency situation, the completion of the stages of urgent and priority emergency recovery work in certain border territories of Donbass contributes to the processes of restoring the reproduction of housing stock and updating the quality of the urban environment. Overcoming the crisis phenomena in the housing sector of new regions requires further development of problem-oriented management methods, solving acute problems of improving organizational and economic mechanisms to ensure the effectiveness of construction and restoration work in the housing sector.

Based on the consideration of scientific and methodological approaches to improving the economic mechanism of municipal authorities, a combination of sectoral and territorial planning mechanisms, taking into account the peculiarities of industrial and technological specialization of the Donetsk region, classification features of the organizational and economic mechanism for updating organizational forms of management of cluster territories of urban real estate development are formulated.

The principles of the matrix method of scenario justification of cluster territories have been developed in order to invest in the revitalization of urban real estate. The competitive advantage of the developed models of renovation and reproduction based on territorial cluster portfolios of real estate is the use of a problem-oriented approach that takes into account the conditions of flexible planning of repair and restoration work in a complex emergency situation.

Организационные формы обновления структуры управления кластер-территориями городской недвижимости в Донбассе

В статье поднимаются вопросы обеспечения устойчивого развития урбанизированных приграничных территорий Донбасса, а также основные проблемы, стоящие на пути достижения восстановления воспроизводства в жилищной сфере. Рассматриваются особенности управления восстановительными процессами пространственно-ресурсного развития жилого фонда в новых регионах. Отдельное внима-

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ние уделяется обоснованию классификационных признаков организационно-экономического механизма обновления с учетом вариантов территориальных кластер-портфелей недвижимости. В качестве примера для рассмотрения выбрана городская застройка исторического центра Мариуполя. Проведен подробный анализ факторов жизнестойкости и жизнеобеспечения городской недвижимости, подходов к формированию адаптационных механизмов для выполнения ремонтно-восстановительных работ. Выделены такие функциональные направления, как регулирование инвестиционно-инновационного потенциала; внесение изменений социально-экономического, экологического и информационного характера; проектное и сценарное моделирование; анализ устой-

чивости решений пространственно-ресурсного деvelopeмента и ревитализации жилищного фонда, а также обновления городской среды. Сформирована структурная модель пространственно-ресурсного деvelopeмента жилого фонда в г. Мариуполь, что позволит улучшить инвестиционную привлекательность и обеспечит гибкое планирование ремонтно-восстановительных работ.

Ключевые слова: устойчивое развитие, организационные формы управления, кластер-территории, городская недвижимость, ревитализация, восстановление воспроизводства жилья

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For citation: Grabovyy P.G., Kushchenko I.V. Organizational forms of updating the management structure of urban real estate cluster territories in Donbass. *Real Estate: Economics, Management*. 2025; 3:6-11.

Для цитирования: **Грабовый П.Г., Кущенко И.В.** Organizational forms of updating the management structure of urban real estate cluster territories in Donbass // *Недвижимость: экономика, управление*. 2025. № 3. С. 6–11.