Social-Oriented Methods as a Promising Tool for Russian Affordable Housing Design

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Abstract. The relevance of the study is due on the fact that in the Russian architectural science there is no applied tools and a holistic methodology for taking into account the changing needs of people in the regulation of consumer properties of housing buildings and residential compounds. The aim of the study is to systematize social-oriented methods of improving consumer properties of housing. The following tasks given: to study the scientific basis of use social factors and to analyze the applied methods of comfort improvement in residential complexes and individual buildings. Generalization of modern Russian and foreign experiences allowed disclose some popular social-oriented approaches for the architectural design of the living environment. These include "co-housing" ("co-living"), "adaptation", "social integration" ("mixed communities"), "identification" ("video-ecological approach"), "universal design" and "exclusive" ("closed communities"). Arguments in favor of their implementation in the practice of Russian architectural design are given.

1. Introduction

Currently, a multi-level approach used in the design of affordable housing. Elements of the living environment considered as part of a constantly changing system of life: apartment – house – residential group – neighborhood – residential area – city – agglomeration – conurbation. In the Russian practice of urban development, the transition from one level of the system to another accompanied by a gradual loss of information about the properties of the living environment. Meanwhile, the needs of a particular consumer are determined on the own basic ideas of comfort. Mostly they are limited to the choice of the site, the house type and the apartment. This contradiction leads to a paradox: the indicator of success or failure of the housing policy of municipalities or developers is the demand for already built housing. This approach does not correspond to the global trends of use different social-oriented approaches. Their application supported by the United Nations. In the "Report of the Special Rapporteur on adequate housing as a component of the right to an adequate standard of living, and on the right to non-discrimination in this context" (2018) special attention is drawn to housing policies, which must contain measures to meet the needs of a single person, group of people or society. The following basic criteria for the adequacy of housing are indicated: "legal security of residence; accessibility in terms of costs; suitability for living; availability of services; accessibility; location; cultural adequacy" [1]. Use of social-oriented methods avoid
serious mistakes at the stage of decision-making about construction. At this time insufficient attention paid to this problem in Russia.

2. Methods
The multidimensionality of the categories and modern opinions used to assess the quality of affordable housing has become a major factor [2-4]. An integrated approach included the collection of extensive material from literary and Internet sources, its systematization and analysis used. Information from the publications of Russian and foreign authors in scientific journals presented on the e-library portal and the multidisciplinary platform ScienceDirect of Elsevier has been systematized. The information that is publicly available on the websites of statistical and sociological services, scientific departments and specialized research organizations has been processed. More than 120 realized and conceptual projects of multi-apartment affordable housing made in reputable architectural offices and presented on their websites have been study. Thanks to this, the points of contact between social-oriented design methods and practices found.

3. Results
3.1. Understanding of the issue
The issues of taking into account social factors in the design of housing began to rise in Russia in the XX century. In the USSR, particular attention was paid to the study of the relationship between demographic parameters and properties of the living environment (Y. Vanagas, O. Jabbar, A. Sikachev, G. Platonov, O. Smirnova). The key document was the monograph "Living unit in the future" (1982). The authors conducted long-term observations and found that the main indicators of the comfort of housing are the efficiency of operation, consumer comfort and efficiency of construction [5]. Later, the methods for predicting individual requirements allowed to detail the characteristics of specialized housing types (G. Dubovitskaya, 1982; N. Potiyenko, 2002; E. Kaidalova, 2005; T. Shamayeva, 2007; T. Asafova, 2010; A. Rodimov, 2013; M. Blagova, 2016). Several dissertations were devoted to questions of formation of infrastructure services (I. Anisimova, 1972; A. Radchenko, 1972; T. Tukanova, 1972; Y. Skoblitskaya, 2013; L. Voropaev, 2015; V. Kolgashkina, 2015). Attempts to generalize foreign experience of application of social-oriented technologies in the construction of residential buildings made (V. Kutuzov, 1962; O. Rzehkhina, 1975; V. Psheennikov, 1985; E. Eschina, 2004; K. Kiyenko, 2005, 2015). Multivariate architectural and typological studies of the living environment were undertaken (A. Krasheninnikov, 1985; G. Lavrik, 1979; V. Molchanov, 2004). Nevertheless, the question of systematization and practical implementation of the existing variety of social-oriented technologies of housing design remains open until now.

3.2. Socio-demographic factors as a basis for the use of diversified methods of designing affordable housing in Russia
Russia is a multinational and multi-confessional country. This circumstance leads to essential differences in the way of life of the population in different regions. Subjects of the Federation differ in the proportion of the urban population, and residents distinguish in life expectancy, family composition, age, health status, income and availability of work, educational and leisure needs, etc. The shortage of affordable housing felt primarily in densely populated regions. Growth of housing stock is one of the main tasks of the national Russian economy. However, the average size of apartments is much smaller than in many other countries. In 2017, the area of residential premises per inhabitant was 25.2 m²/person. For comparison, in 2010 in the US – 69.7 m² in the UK – 44.0 m², in Germany and Austria – 42.9 m², in Finland – 38.9 m², in Hungary – 31.2 m², in China – 22.7 m² [6, 7]. Dynamics of socio-demographic parameters is monitored in the course of statistical observations. Let's consider some information.
One of the surveys conducted by the Russian Public Opinion Research Center showed that about 4.8% of households are not satisfied with their housing conditions. The most important problem for Russia is the lack of accommodation. In 2016, it was the main cause of dissatisfaction for 25.8% of households and 46.2% of households with children [8]. One in ten households assesses the state of their housing as "bad" or "very bad". The main factors of dissatisfaction were household and communal amenities. According to 2017, 34% of Russians consider the condition of their homes good, 50% of citizens — satisfactory, and 16% — bad. At the same time, residents of monolithic and private houses and residents from houses built after 2000, evaluate living conditions better. It is important that the vast majority of respondents would prefer to live in a house with a life of less than 7 years [9]. According to long-term data (1994–2016) of the analytical center of Yuri Levada poor housing causes family problems in 10–15% of respondents [10].

Conducting sociological research allows us to identify the priorities of the quality of the living environment and social infrastructure. Priorities given to playgrounds (84% of respondents), parking lots (71%), grocery stores (66%) and green spaces — parks or squares (60%). Comfort in a residential cell (apartment) Russians associated with the presence of a balcony or loggia (55%), elevator (55%), separate bathroom (53%), trash chute (48%), gas or electric stove (45 and 39%, respectively), and in the entrance — with the duty of concierge or security (38%) [9, 11]. A survey conducted in 2013 by the sociological service of the ROMIR holding showed that the prospects for the formation of the housing market largely depend on the age of the respondents. For example, people over 45 rarely intend to improve or expand housing, but more than a third of respondents aged 25–34 plan to solve the housing problem within 3–7 years [12].

Now the opinion of the population taken into account in the development of current functional and planning schemes of multi-apartment housing. In particular, one of the reasons for the increase in the number of houses with small apartments was the changed attitude of people to cohabitation of generations: in 2003, only 52% of respondents believed that unmarried children older than 18 years can live independently, in 2016 the share of respondents with the same point of view increased to 60% [13].

Some surveys of the population allow us to draw conclusions about the promising trajectories of the development of constructive solutions of multi-apartment housing: 17% of respondents would like to have an apartment in a brick house, 7% in a panel one, and 3% in a monolithic one [9]. An additional resource of sociological surveys is their use as indicators of consumer quality of the living environment [14]. Represent the value of the work of sociologists from Samara. Residents of two new districts — "Krutye Klyuchi" and "Yuzhny gorod" as unattractive aspects of life marked a remoteness from good schools and kindergartens (42% and 45%), lack of leisure facilities (30% and 42%), big distance from places of employment, markets and shops as well as monotonous buildings and poor architecture (31% and 0.4%). It should be noted that the affordability of housing continues to be the main factor affecting the purchase of an apartment in those location (65% and 56%, respectively) [15].

These and other data show the need to diversify the types of residential structures on the basis of taking into account the diverse needs of the population.

3.3. The best practices in the use of social-oriented methods in the design of affordable housing

"Cohousing" ("coliving") is a popular developing concept of housing organization, in which the union of residential cells accompanied by the organization of spaces for joint use. Some scholars see in cohousing the continuation of the idea of houses-communes, which built in the USSR. The idea of co-housing appeared in the late 1960s in Denmark, spread to Scandinavia and Germany, and then to the rest of Europe, and in the late 1980s reached the United States. Social, cultural, environmental and economic sustainability ensured in the cohousing groups and manifested in moderate self-sufficiency, respect for the environment, the use of environmentally friendly materials and technologies [16, 17]. One of the apparent example is cohousing "Olympia Place" (2016, USA, Amherst). It designed to
accommodate students and has a developed core of public spaces. The architects created blocks of two-four bedrooms and common living areas with kitchen [18].

"Adaptive approach" conditioned by the possibility of "flexible" housing construction. The main idea is the design of residential structures - land, houses, living cells, taking into account their long-term development and adaptation to the changing needs of the individual, family or community. In the urban context, an adaptive approach most often used to identify specific locations for new social infrastructure. The flexible structure of residential buildings is associated with changes in the size and purpose of collective spaces. In private residential units, conditions created for the integration or differentiation of residential spaces or their functional zones [19–21]. As a rule, flexibility and variability provide special design techniques. For example, in cohousing "Coop Housing" in Berlin (Germany, 2013) a simple wireframe scheme is used. It allowed create a set of options of the organization and the subsequent change of inhabited and public spaces. All apartments have different size and configuration. The 47 % of the total area of the complex occupied by standard apartments. In addition, six different "cluster" apartments, which can accommodate from 4 to 21 people, were designed [22].

"Social integration" ("mixed communities") is one of the most popular topics in the design of cities and districts, which given special attention in Western Europe and North America. It is a part of a policy to prevent segregation and support social diversity. This method based on the idea that poor housing conditions lead to a decrease in the quality of life (deterioration of physical and mental health) and aggravation of social contradictions. These problems mitigated by designing housing structures in which people are ready to live together despite differences in property, class, ethnicity or other characteristics. For this purpose, urban planning regulations are developed and conditions for architectural diversity created in compliance with the standards of social and affordable housing [23–25]. An example of social integration was the inclusion of a residential house for the homeless "La Casa" into quarter on Irwin street in Washington (2014, USA). District's Department of social services wanted to change the paradigm of care for the homeless. The house is designed 40 rooms provided with light and ventilation, each of which designed for one person. Nearby there are utility rooms with kitchens and bathrooms, as well as developed public areas [26].

Identification (video-ecological) approach is to design the living environment with the given composition characteristics, which make it easy to navigate and contribute to the preservation of the identity of a particular place, and visual images have a positive impact on a health of person. The main means are the regulation of the scale of development, texture and texture of surfaces, color combinations and illumination, the use of super-graphics and mural art, which affect each resident, causing positive emotions. Another important factor is the merger with the natural environment, the development of green spaces [27, 28]. For many years, the French architectural firm KOZ successfully overcomes the opinion about the stereotyped appearance of social housing. For example, in 2011 a complex of two buildings called "Nest" built in the North-West of Paris. Blocks have outwardly projecting volumes, located in irregular order. The sense of dynamics supported by color: facades with white, yellow and green elements resemble a mosaic. They supported by the pattern of the railing transitions and loggias, created from intersecting the green rods for a variety of walkways and loggias. The building has shared terraces where you can spend leisure time and communicate with neighbors [29].

At present time, "universal design" has become a prerequisite for the design of the living environment. The term was coined in 1988 by architect Ronald L. Mace (College of design, University of North Carolina, USA), who considered universal design a special approach. Means of universal design allow create conditions for the use of objects by all people regardless of age, health status, etc. With the help of various techniques that provide maximum convenience of the environment, the life of each person is simplified. This concept recognizes, respects, values and takes into account a wide range of human needs in the development of ergonomic properties of products, environments and information systems. Universal design helps to eliminate the need for subsequent changes that violate the original intent [30–32]. A striking example of the implementation of the principles of universal
design is the project of the residential complex "The Future Sølund" for Copenhagen. The architectural solution provides for the integration in one place of people of different ages and social status [33].

Now in intersection of methods of social integration and universal design, a new direction is developing – "inclusive design". "Exclusive methods" ("closed communities") are focused on taking into account the specific needs of people who tend to limit the circle of communication or increased social control. One of the first scientists to consider this method was O. Newman (1972) [34]. Currently, exclusive methods used to unite people in different types of communities (partnerships, communes). Most often used models of the following types: "lifestyle", "security zone" and "elite". As a rule, residents have a similar life position and connected by a common cause (business) or leisure preferences. Such communities formed as autonomous areas isolated from the urban environment. Typical examples are environmental and military settlements, research settlements, art settlements, sports villages, ethnic settlements, etc. [35–37]. Increasing the role of ecologization the living environment has caused increased attention to environmental settlements. One of the most elegant solutions - the concept of ReGen villages, proposed in 2016 by Danish architects. The holistic approach combines many innovative technologies: energy-efficient houses, renewable energy sources, organic food production, recycling, etc. [38, 39].

4. Discussion
One of the effective tools to improve the consumer properties of the living environment is the implementation of sustainable development strategy. It is associated with the formation of affordable housing complexes based on environmental, social and economic factors. At the end of XX - beginning of XXI the most important condition for the formation of a comfortable architectural reality is social-oriented architectural design. It is one of the most important direction of increase of consumer properties of housing. The conclusion about the important role of statistical data characterizing the socio-demographic dynamics can made on the analysis of the existing applied approaches. The results of sociological surveys reflect changes in people's needs for living conditions. The requirements of the population to the main parameters of the living comfort reduced to the following groups: physiological, functional, social, psychological and aesthetic. They caused on demographic features and economic opportunities of people. In market conditions, the role of indicators of housing quality are the price of 1 m², the area per 1 person, the completeness of social infrastructure, design solutions, compliance of planning schemes with demographic trends.

Innovative practice of using social-oriented methods provides adapting the parameters of the living environment and living conditions to individual needs. The main goal is to improve the quality of life through the implementation of more thoughtful and effective urban planning and architectural design solutions, which often developed with the use of participatory technologies. They based on the cooperation and interaction of all stakeholders – residents, government, professionals and business. Practice shows that designing on the basis of participation leads to a more effective result at different stages: from the definition of key problems, the development of housing policies, plans and programs to their implementation and inclusion in the processes of daily management, decision-making and maintenance.

5. Conclusions
The study revealed the following relevant socially-oriented methods of designing affordable housing: "cohousing" ("coliving"); "social integration" ("mixed communities"); "adaptation"; "identification" ("video-ecological approach"); "universal design"; "exclusive methods" ("closed communities"). Certain features of urban planning, space planning and engineering solutions correspond to each of them. The results of the study allow us to conclude that it is expedient to introduce the identified social-oriented methods and their combinations into the practice of designing affordable housing in Russia.
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