UDC 711

A.A. Gorsha, I.V. Kukina, Y.V. Chui
Siberian Federal University, Russian Federation, Krasnoyarsk, Svobodny, 79
e-mail: nastya_2793@mail.ru, ikukina@inbox.ru, yanachuy@mail.ru

EXPERIENCE OF TRANSFORMING PUBLIC SPACES OF RESIDENTIAL AREAS IN THE SECOND HALF OF THE 20th CENTURY IN GERMANY

Abstract. *The article reveals the results of field studies of transformations made to public spaces in residential areas of prefabricated buildings in the second half of the 20th century in the cities of Germany (Berlin−Fennpfuhl, Marzahn, Dresden−Prohlis, Gorbitz, Halle−Silberhöhe, Neustadt). Based on the increasing needs of the population's quality of life to prevent degradation of spaces and outflow of residents, there was a need in these cities to transform residential areas. The article analyzes methods and approaches to the transformation of public spaces in the areas of the post-socialist period, based on the renovation of the existing areas of prefabricated building in the 1960-80s in Germany.*
Keywords. *areas of prefabricated buildings, public spaces, transformation of architectural environment*

Introduction

The unsatisfactory state of the domestic housing stock of prefabricated building, erected in 1960-80s, shows the overdue modernization to extend the terms of its reliable and sustainable operation. Moreover, public spaces in residential areas of prefabricated construction are actively used by the residents, despite the poor architectural and environmental quality of the areas as a whole. The state Duma of the Russian Federation passed the bill on the renovation of the housing stock in the city of Federal importance, Moscow, on 20 April 2017. In connection with the passed documents, first of all, it is planned to demolish and build new housing, modernization is considered extremely rarely. In this regard, the experience in reconstruction of residential areas of prefabricated housing construction of the socialist period in the cities of East Germany, including public spaces: Stadtumbau Ost renovation program (urban Restructuring of the East) for Gorbitz residential area in Dresden − 2002, for Fennpfuhl residential area in Berlin − 2004; SSP program (Soziale Stadt Program) for residential area of Gorbitz in Dresden − 2005, for residential Prohlis area in Dresden − 2000; IHK (Integriertes Handlungskonzept − a comprehensive concept of operations) for residential area of Gorbitz in Dresden − 2010; INSEK (Concept for Integrated Urban Development) for Prohlis residential area in Dresden − 2011, for residential area Silberhöhe in Halle − 2007, residential district Marzahn-Hellersdorf − 2007, 2011/12; NOK program (Neuordnungskonzept − the Concept of Reorganization) for Silberhöhe residential area in Halle − 2001; the Umbau Ost program (Conversion East), EFRE (European Fonds for Regional Development), overall investments 37 mil. euros for the residential area of Neustadt in Halle, is considered.

In these programs for the renovation of the prefabricated buildings areas the opposite task was set. The task was to carry out not total demolition of buildings, but its modernization, with a sharp increase in living comfort in residential buildings and comfort of open public spaces. Thus, not only the way of life of the population is preserved, but also the functions of open public spaces are expanded. Public spaces are an important part of residential areas in terms of social, economic and functional relations.

With the development of public spaces in the residential areas of prefabricated construction of the socialist period, it is possible to create the most comfortable environment for people.

Methodology

The methodology of the study is in-situ examination of the reanimated residential areas of prefabricated housing construction of the socialist period in the cities of East Germany (Berlin–Fennpfuhl, Marzahn; Dresden–Prohlis, Gorbitz; Halle–Silberhöhe, Neustadt). International research project was carried out in September 2016 by a group of universities in the field of architecture and urban planning of the three countries: Germany (Karlsruhe Institute of Technology), Ukraine (Odessa State Academy of Civil Engineering and Architecture; Kharkiv National University of Civil Engineering and Architecture) and Russia (Irkutsk State University; Siberian Federal University in Krasnoyarsk) with the support of the Volkswagen Foundation.

The analysis of management activities was carried out through the meetings with the representatives of public associations and offices, project groups, Management Department, through studying the material provided (presentations, project materials (maps, charts), oral reports), through the sequence of decision-making of the renovation programs implementation.

Self-study and analysis of project materials. The legal documents of Germany (Federal *Building Code* 1960 (Bundesbaugesetz, 1960); Urban Development Act 1971 (1971 Städtebauförderungsgesetz); Federal Building Code (Baugesetzbuch (BauGB)); websites and brochures of the renovation programs for each area, as well as websites of the software developers have been reviewed.

Research and analysis

The renovation program of the prefabricated areas in 1960-80s in Germany is based on three methodologies: research, design and implementation.

The methodology of the study includes analysis of statistical data on the areas of renovation with the following indicators:

− demographic: population size, age structure, natural population growth;

− migration: the number of internal and external migrations; the rate of migration intensity; the direction and structure of migration flows; the absolute number of arrivals, departures, migration balance, including by territory and nationality (migration country). Migration indicators have a great impact on demographic changes;

− social: size and type of families (marital status, distribution of families by the number of cohabiting family members); level of education of the population by qualification criteria (higher; secondary; primary (including vocational); basic general (incomplete secondary); number of people with limited mobility; indicators of providing the population with availability to attend schools and kindergartens; access to social benefits (kindergartens, schools, public places, clinics, supermarkets and shopping centers);

− economic: the level and dynamics of unemployment, composition, structure and dynamics of economically active population; the level of employment and income of the population; the structure of employment by ownership and economic activities; indicator of the ability to run their own business;

− statistical data for the design: the number of buildings and their wear, including apartments and empty apartments; the number and equipment of schools, kindergartens, public service facilities and the number and availability of public recreational improvement spaces; the number and availability of public recreational spaces improvement; the number of empty unused spaces, the activity of territories use; the number and availability of landscaped parking lots and garbage bins; presence of outpaces in front of public facilities, presence of security systems; routes, types and stops of public transport; number of green areas and areas with hard surface.

With the help of the same methodology of statistical studies, it is possible to assess the project implementation and dynamics of changes in the area.

In addition to statistical data, the analysis of districts includes all the traditional studies adopted in urban planning, namely location in the city, transport communications, infrastructure facilities. The main purpose of the research method is to determine problems of the territory.

The peculiarity of the design technique is division of the project process into two development stages: a renovation program and a renovation project. At the same time, a renovation program is not a cited document, it is constantly updated upon a joint decision of residents, municipality, investors, government agencies, and designers. Therefore, a renovation project is repeatedly amended.

A municipality determines the areas for renovating residential areas at a stage of program development and introduces them to a development Charter. The explanatory note should provide justification for criteria, parameters and boundaries of areas in need of development. The local district development Charusat is published and becomes legally binding. The municipality informs the land cadastre service about the need to change the status of the land plots selected to development. According to the German law, the areas of renovation upon a decision on modernization are provided with centralized funding.

Development of the program is based on the identified problems and meetings with residents, city administration and designers, during which a joint statement of goals and objectives for the development of the residential area is made, the process is coordinated by a public organization of local government.

The Department of Urban Planning provides budget funds, and is responsible for decisions of the city council, tenders and grants in the field of renovating living environment. The main task of the Department of Urban Planning is to develop concepts of integrated actions with the continuous inclusion of ideas to the project initiated by the participants in the area at all the levels of design. It is in constant contact with other departments of a city and participates in the implementation of the program goals.

Work on the project is made in the following order:

1) a public organization within local government elaborates a plan for a district development with participation of the most competent groups of residents on a voluntary basis and a professional architect;

2) the public organization within local government submits the plan of an area development for discussion to the Department of Urban Planning;

3) the Department of Urban Planning makes (if necessary) additions and adjustments to take into account the interests of the city (municipality) or wider areas (country, region);

4) The amended plans are sent back to the public organizations within local government where new hearings are held for their final approval.

The result of the first stage of design is the development strategy for the district, presented in the form of a catalog of programs aimed at renovating residential area.

At the stage of embodiment, the individual events are implemented from the catalog of program directory, the development of key projects starts and priorities are established in accordance with the areas of action. The implementation phase is long-term and is supported by the urban development funds of a Federal program.

The concept of integrated action includes informing citizens through:

1) advertising and raising awareness about the campaign to involve public into active actions to support jointly developed project.

2) Publication on websites, distribution of programs, exhibitions, brochures:

− strategic development plans;

− detailed justification plans;

− program for the landscape organization;

− licensing activities, etc.

All published documents and projects have a spatial and temporal reference.

The areas of prefabricated construction, built in the 1960-80s in the GDR, after the unification of Germany are outdated and are physically and morally deteriorated. A large number of houses are not used. Residents start leaving these areas, including due to the insecurity and insignificance of open public spaces, lack of different types of recreational areas, children's playgrounds and sports facilities. The emergence of these problems initiated development and adoption of programs for renovating of prefabricated housing of the socialist period by federal and municipal authorities of Germany. The programs are aimed at improving living conditions, increasing the use of the territory, search for optimal modernization concepts for the areas of the post-socialist period, taking into account modern needs of the population. The concepts consider social, architectural, environmental and economic principles of territorial organization that constantly interact and are inextricably linked. The concept of districts renovation is focused on formation of multifunctional spaces and renovation of housing to develop eco-oriented district and a commercially active centre; to involve all social groups in the design process and to improve the economy in the districts.

In accordance with the renovation programs, public spaces are arranged hierarchically based on the social behavior and needs of the district residents, the possibility of individual and multifunctional use. Planning of public spaces is also organized depending on the type of borders (accessibility), the concentration of service facilities and functional content, a system of green spaces:

1) adjacent areas to houses – visually viewed, closed;
2) visually viewable private spaces;
3) local area of common use;
4) the total space within residential groups (park, playground);
5) system of continuous green spaces (green corridor, boulevard, alley);
6) neighborhood centre within the district (the area with landscape beautification, youth center with sports fields and a skate park, space areas of schools, community center);
7) centers of regional significance – areas, local centers, commercial axis with active transportation hub.

Differentiation of open public spaces contributes to the establishment of spatial relations, increase of population activity, increase of control over the territory, overcoming social segregation. For example, yard areas and common spaces of residential groups belong to small communities; private areas are used by the residents of the first floors (family); visually viewable private spaces belong to the residents of the house; the territory inside the district is used by the residents of the neighborhood; public spaces of district importance are common area. So, the more the territory used as a social space, the higher its development and security. With this approach to the design, open public spaces are transformed into new types that are focused on consumers (people living in the area). An important part of modernization of open public spaces is self-identification of residents with the territory of their district, yard, etc. Recognition of the territories is formed by the visual environment through the application of art objects, fountains, placing mosaic blocks on walls, and individual landscape organization of the territory.

Between the open spaces, there are visible borders on which regulations, for instance, in height, width, type of fencing and landscaping are imposed, i.e. you can see the inhabitants of the first floors, but you can not enter their territory. These boundaries are a kind of transition zone that provides interpenetration of adjacent spaces.

Due to their own small plot of land residents of the first floors received private spaces (Fig.1), the possibility to enter into the apartment directly from the street. This increased the demand for apartments on the first floors and reduced the costs of the management company to maintain the local area. But, at the same time, the residents increase their personal responsibility for the territory and financial costs for the land maintenance. In such areas the level of usage activity is increased, the feelings of ownership and responsibility are formed. People constantly supervise what happens, which increases control over the surrounding space. It should be noted

that the formed house territory in residential areas of Germany partially embodied the idea of a garden city – for those who live on the first floor of their own land. The same applies to the residents with terraces on the upper floors. This space is a link between private and public space, which provides proximity between the internal structure of the building and public spaces of the city.

The quality of improvement of visible private spaces has increased due to the making spacious lawns, solution for water disposal and parking spaces.

With regard to the common areas near a house, different principles and approaches have been used in each area to organize them. So, in some residential areas residents are involved into the design of the yard spaces and they develop areas using small architectural forms or art objects. In the process of its design, the territory of the interior space is tried to be adapted to different age groups. The number and quality of landscaping and functional saturation of local areas form a convenient place to stay in the area.

The total space within residential groups in different areas is formed individually. For example, these spaces are most pronounced in the areas of Gorbitz in Dresden and Marzahn-Hellersdorf area in Berlin. Common spaces within residential groups in the Marzahn-Hellersdorf area in Berlin ceased to be in the interests of the residents. In addition, there were significant signs of wear of small architectural forms. Sport playgrounds remained unused. Pedestrian roads were damaged. The program has given the opportunity to update children's playgrounds, to make sidewalks, to establish small architectural forms. Internal passages through the residential groups connect separate courtyards with each other (Fig. 2).

In all residential areas, the number of stores in buildings was reduced to the optimal ratio of the height of the building and space for comfortable perception of the environment by a person, to reduce the number of empty apartments. To create or increase the area of open public spaces, empty buildings and houses were demolished. But the demolition of residential buildings not always has a positive result, as it leads to the formation of empty unused spaces that does not belong to residential groups.

The creation of continuous systems of green spaces leads to the fact that the natural landscape is smoothly introduced into the structure of the areas, for example, as in the residential area of Silberhöhe in Halle. There are measures of recultivation, aimed at restoring a waterway, as well as management and retention of rainwater to optimize the functions of the received water and to improve the planning of open space. The restoration of water systems was carried out in residential areas of Gorbitz in Dresden and in Galle (Fig. 3).

The fact that many people lost their jobs after the closure of many industrial enterprises and that retail trade and small businesses were unable to develop, led to disappearance of services, reduced use of public spaces and devastated areas. When there are active commercial spaces during the residential structure, a heavily used pedestrian street or local space are formed. They form the centers of public life and are located near the public rail transport lines. The linear structure of the public center ensures connection of the system to open public spaces (street, square, park, alley, avan-space, recreation area) with the placement of trade enterprises, consumer and cultural services, the mobility of residents increases due to the border location with the transportation hub. Regional centers are markets, weekend fairs, events, festivals. The space and the whole structure of the service is focused on pedestrians and is scaled to them. The centers of regional importance improve the image of the district and affect the development of small and medium-sized businesses, i.e. increase investment attractiveness, including due to the fact that taxes from doing business go to the budget of the district for its development. The emergence of the district center is an incentive for the development of the adjacent residential area (Fig. 4).

Inside the district centers, the spaces to meet the needs of different social groups and solve common problems are used as places for events and joint pastime (events, training, meetings, club, leisure activities, etc.), they allow strangers to create local communities. An example of such a space can be seen in the Neustad district in Galle. Along the street Galerie im Grünen

Tulpenbrunnen a square with a fountain, playground and infrastructure was formed. The area is the center of the nördliche Neustadt (North) residential area (Fig. 5). A park (Regine-Hildebrandt-Park) with stairs and children's playgrounds was built in the residential area of Marzán-Hellersdorf in Berlin, as well as an open public space for recreation in the new residential development. Public objects can also be attributed to the inside of the district centers. They contribute to the social activity of residents, such facilities are public centers (in Neustadt, in Prohlis, Morzan-Hellesdorf, Gorbitz), schools (Gorbitz in Dresden), youth centers, playgrounds and skate parks. Positive functioning of such a space can be observed in the area of Prohlis in Dresden. On the street Gamigstraße a BMX platform, which is built on the basis of user interests, was created. A playground, located near the youth P. E. P. center has also been organized. This space is actively used.

In the process of renovating the areas of the prefabricated building of the socialist period of construction, the differentiation of public spaces significantly affects the changes in their structures. These changes are based on emergence of new forms of private and public relations in the open spaces of residential areas.

Figure 1. Gorbitz in Dresden. Private space. Open personal space makes a unique and strong connection with the apartment

Figure 2. Marzahn-Hellersdorf in Berlin. The total space inside the residential groups. Playground for children

Figure 3. Prohlis in Dresden. Reclamation of the river Eberbach flowing in the structure of district The formation of a green frame

Figure 4. Gorbitz in Dresden. The linear center of the district value along the rail transport

Figure 5. Neustadt in Halle. Inside the district center.
The recreation area with commercial service

Conclusion

In connection with the upcoming reconstruction of residential areas of prefabricated construction during the socialist period of construction in the Russian Federation, it is very useful to study the experience of modernization of the structure of open public spaces in Eastern cities of Germany. In the Russian Federation, public spaces in residential panel areas are actively used by the residents, despite their poor architectural and environmental quality. Public spaces are the subject to a large number of obligations, such as collective use, individual use, etc.

The objectives of regeneration are: the formation of a commercial-active zone of cultural and consumer services; a clear division of residential and public spaces with an ordered system of land use; the formation of a unified system of green spaces; the identification of the main pedestrian intra-district relations; the arrangement of school areas; tram net arrangement (with the possibility of connection to the urban transport system).

Flexible management and creation of conditions for the coexistence of different interests in one territory is based on establishment of partnerships for the purpose of coordinated long-term development of residential areas.

Thus, by means of internal structuring, differentiation of public spaces depending on social impacts and the conditions of sustainable development of the residential area are formed.

References

1. Kukina, I.V. (2014) 'Trends in the Development of Agglomerations. Foreign Experience. Monograph', *Monograph*, 144.
2. Kukina, I.V. (2012) 'Living Environment as an Object of Modeling. Canadian Version of the Search for a "New Urbanism" (Case Study of Toronto)', *Modern Architecture of the World* 2, 165-182.
3. Kukina, I.V. (2005) 'Elementary Planning Residential Formations', *Housing Construction* 8, 26-29.
4. Kukina, I.V., Posdniakova, I.G. (2010) 'Development of Scientific Conceptions of Elementary Residential Forms at the End of the 20th Century and Beginning of the 21st Century', *Housing Construction* 11, 42-48.
5. Fedchenko, I.G. (2016) 'Formation of Residential Planning Units in the Middle of the 20th – Early 21st Century', *Thesis for the Degree of Candidate of Architecture*, 140.
6. Fedchenko, I.G. (2013) 'The Tendency of Transformation and Principles of Planning of Structure Urban Residential Unit (Microdistrict) in the Early 21st Century', *City Fit for Life*, 23-29.
7. Slakov, P.F. (2013) 'On the Issues of Eco-Oriented Reconstruction of Major Cities Based on the German Experience', *City Fit for Life*, 67-73.

8. Chuy, Y.V. (2013) 'The Relationship of Private and Public Interests in the Open Spaces of the City on the Example Research of Cities in Germany and Krasnoyarsk', *City Fit for Life*, 80-86.
9. Unagaeva, N.A. (2014) 'Ecologo-Orientirovannoe Proektirovanie Landshafta', *Vestnik Orenburgskogo gosudarstvennogo universiteta* 5(166), 143 –148.
10. Meerovich, M.G., Frantseva, Yu.V. (2017) 'Problems of Complex Regeneration of Residential Area of the Regions of Large-Panel Development. Possibility to Adapt German Experience to Social, Economical and Law Conditions of the Countries of CIS, *Izvestiya Vuzov. Investitsii. Stroitel'stvo. Nedvizhimost* 7(1), 120-130.
11. Engel, B., Rogge, N., Malko, A., Frantseva, Iu. (2016) 'Unloved Heritage Socialist City?', *VW Foundation, KIT Karlsruher Institut für Technologie, Institut IESL-Institut Entwerfen von Stadt und Landschaft*, 276.
12. Kozlova, L.V. (2017) 'Transformation of Public Spaces in Residential Areas of 1960-80s Years: the Experience of Germany', *AMIT* 2(39), 255-267.
13. Anisimova, L.V. (2002) 'City Landscape. Socio-Ecological Aspects of Design' (*Vologda VoGTU)*, 192.
14. Krasheninnikov, A.V. (2005) 'Urban Development of Residential Development: A Study of the Experience of Western Countries', *Arkhitektura-C*, 112.
15. Krasheninnikov, A.V. (2012) 'Structure of Social Space in Pedestrian Realm', *AMIT* 4(21), 7.