PROBLEMS OF MULTISTOREY HOUSING RENOVATION IN BULGARIA

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Abstract
In the paper changes in Bulgarian urban structure and housing are reviewed. Development of apartment housing built by industrialised technologies during the age of socialist government (1944 - 1989) and the follow-up period are examined. The specific Bulgarian phenomenon of prevailing of owner-occupied apartment housing (condominiums) is described as a major peculiarity of Bulgarian urban housing. The current problems for sustainable development of Bulgarian mass housing have been analysed and possible solutions have been outlined based on presented pilot cases.[1]

Keywords: renovation, panel buildings, condominium building, high rize buildings, energy efficiency, homeowners'association

ПРОБЛЕМЫ РЕНОВАЦИИ МНОГОЭТАЖНОЙ ЖИЛОЙ ЗАСТРОЙКИ В БОЛГАРИИ

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Аннотация
В статье рассматриваются изменения в городской планировке и жилищном строительстве в Болгарии. Проанализированы особенности развития индустриального жилищного строительства во времена социализма (1944–1989 гг.) и последующий период. Специфическое для Болгарии явление – преобладания жилья, занимаемого владельцами жилья (кондоминиумы), – описывается как главная особенность болгарского городского жилища. Проанализированы текущие проблемы устойчивого развития болгарского массового жилищного строительства и предложены их возможные решения на основе изучения особенностей некоторых пилотных проектов.[2]

Ключевые слова: реновация, панельные здания, кондоминиум, высотные здания, энергоэффективность, объединение домовладельцев

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Introduction. Changes in Urban Structure After 1944

After the final establishment of the totalitarian state in 1947 and the related nationalization of large urban property and production, and the collectivisation of agriculture, large-scale forced industrialization began in Bulgaria. It lead to the beginning of intense urbanization. As a rule, urbanization in Bulgaria was fueled by close migration to the cities from the neighboring villages. This migration is conditioned by the abolition of incentives for the development of competitive agricultural production due to forced collectivisation of the land combined with forced industrialization in the cities to create new, relatively well paid places for the "working class hegemon" according to the dominant by that time ideology.

In the period 1947–1960 1.2 million people moved from villages to the cities, and 1.25 million – between the years 1961 and 1971. In total, 2 459 100 new inhabitants appeared in the cities in the period 1947–1971. The move of significant masses of people to a limited number of large cities in a relatively short time period puts pressure on their proper functioning and development. A key issue was the provision of sufficient housing for new urban citizens. To stimulate the flow of population to cities, the centralized state has set itself the task of starting a massive housing construction – a process unknown to Bulgaria so far leading to irreversible social, economic and spatial changes in the development of Bulgarian cities.

The concept of dwelling as an industrial product ("a machine for living") was inspired by the ideas of architectural modernism at the beginning of the twentieth century (Le Corbusier etc.). For the most parts of Europe these ideas remained unrealized. After the Second World War destroyed Europe was experiencing a severe shortage of housing and this created conditions for the practical application of pre-war ideas for industrial methods in construction. In the Eastern European region that was largely controlled by the Soviet Union, the most intensive construction of new housing in cities took place in a centralized manner by the state. It happened for a number of reasons. The sharp quantitative growth of housing needs in large cities implied the decision to start mass housing construction implemented by industrialized methods. Labor and time savings were achieved by means of industrialization and a high degree of mechanization of building process. A seamless production of housing elements in factory conditions was achieved. Housing elements were assembled on the construction site in relatively short terms (Figure 2).

The rhetoric of the "modern movement" in architecture created revolutionary models for the development of the city and the home of the future. They are embodied in programming documents such as the "Athens Charter", created in the main part by Le Corbusier on the basis of discussions at the CIAM Congress in Athens in 1933. According to the Athens Charter, a spatial separation of urban functions was announced, in contrast with the historically formed structure of traditional settlements. Housing areas should be developed within the concept of hierarchically structured residential areas consisting of micro-regions, etc. Public service facilities should be also hierarchically structured by type – daily, periodic and episodic level of service, located in the space of living environment according to their level.

In paradox at first glance, but in fact logically, this pre-World War II revolutionary vision of the new city has found a partial realization in the post-war "socialist urbanization" of Eastern Europe, including the area of the then Soviet Union, which was generally less developed than the western part of the continent.

Bulgaria does not stayed away from this trend. Since 1964, “homebuilding factories” – places for industrialized production of dwellings emerged. Three types of industrial building systems were mainly used: Large-size panel system (EPGS) – initially and, from the middle of the 1970s – Large-size shuttering system (EC) and Package lifted plates system (PPP). Of these, the Large-size panel system was predominantly used, with more than 70% of the industrial housing construction in Bulgaria.

The "condominium housing" phenomenon

Condominium housing – multi-storey apartment buildings with co-ownership of common areas and individual dwellings – apartments owned by different owners, exist in all European countries. In Bulgaria the way this housing type was created differs from the most countries in Europe. In Western Europe and also in countries from Eastern Europe condominiums were found before the World War II through the combined efforts of one or several private investors to build and operate residential apartment buildings. In post-war Eastern Europe most of the new apartment buildings were built and owned by the state, and the dwellings were exploited as rental properties. They were privatized mainly in the period 1990-2000 along with the imposition of certain conditions for collective management and collection of running costs for the operation of these buildings. This was regulated by the existence of requirements for collective representative bodies at the building level - associations of owners. This is the case in Romania, the Czech Republic, Hungary and others.

Figure 1. Condominium housing in Sofia downtown

Following the European experience, starting from the 1920s, Bulgaria created the first "residential cooperatives" – multi-storey apartment buildings with different apartment owners (Figure 1). As their name shows, they emerged as a result of the joint efforts of investors united for that purpose. Some of them were remarkable in architecture. The functioning of these buildings was governed by relatively good laws made in a Western European manner – “Condominium Law” of February 15, 1933 and Ordinance for Condominium buildings of November 5, 1935. During the socialist state after 1944 the government, as well as in the rest of the Eastern European countries, seized the role of an investor and in order to satisfy its policy of forced urbanization, the mass construction of multi-storey residential buildings began in the so-called “residential complexes”. However, in contrast to the other Eastern European countries and the Soviet Union, the property of the newly built apartments in Bulgaria was transferred to the tenants immediately after their completion without proper legal arangement for maintenance and management of these buildings. In Chapter Four of the Property Act from 1951, texts from old pre-war rules, governing condominiums were copied, but most of the tenants' obligations were abolished, leaving only rights. This law was in force until the adoption of the Condominium Management Act in 2009. As a result management and maintenance of multistorey residential buildings was inoperative till that time.

Bulgaria is now among the countries with a record high share of the dwellings owned by their tenants. The abnormally high share of owner-occupied dwellings is a problem, inherited from the past, which implies current and future problems of the operation of Bulgarian housing sector.

The political changes in Bulgaria after 1944 led to almost complete destruction of the existing housing market as a tool of regulating the housing needs of society. The rental housing stock was practically non-existing. The stages of maintenance and management of most of housing in the period 1950–1989 were abolished by the state, thus leading to fundamental problems with long-term effect for the Bulgarian housing sector:

– chronic lack of proper maintenance of the newly built and existing housing stock;
– inability to conduct a social housing policy for vulnerable population groups;
– low mobility of the citizens.

Current Problems of Bulgarian High Rise Housing Estates

The most serious problems of Bulgarian mass housing refer to apartment dwellings, located in a multi-storey condominium buildings built in the 1970s of the 20th century by industrial technologies. Apart from the way they are erected, these problems are also related to their operation within multistorey buildings with associated use of shared building communications, engineering systems and all associated structures. At the higher level problems arise within housing communities consisting of high-rise apartment buildings, structured in so called “housing complexes” (Figure 2).

“Housing complexes” were built in time of the centrally planned economy at non-market subsidized prices of building materials and energy and immediately sold to their new tenants without requirements for adequate management and maintenance, suffered initially by inherent deficiencies. In the new political environment after 1990, “housing complexes” add to their built-in defects new ones. All these shortcomings can be summarized as:

a) functional, communication and spatial desintegration regarding the existing urban structure (neither organic parts of existing city nor separate satellites);
b) underdeveloped social services infrastructure, making “housing complexes” bedroom estates – parasitic with regard to the big city and without identity;
c) large unmanaged empty spaces, unsupervised, accidentally filled with barracks and unlegal landfills;
d) lack of garages – the planned underground ones were not built, the newly built on-the-ground garages are most often illegal and damaging the environment;
e) lack of space identity – unlike the traditional housing estates, where the ground floor is usually place for trade, services and small business, the high rise residential buildings are “culturally dead” – being filled only with apartments;
f) poor quality of thermal insulation, noise and depreciation of engineering installations;
g) restituted to previous owners land, often interlocked between housing blocks, aggravating and compromising the environment.

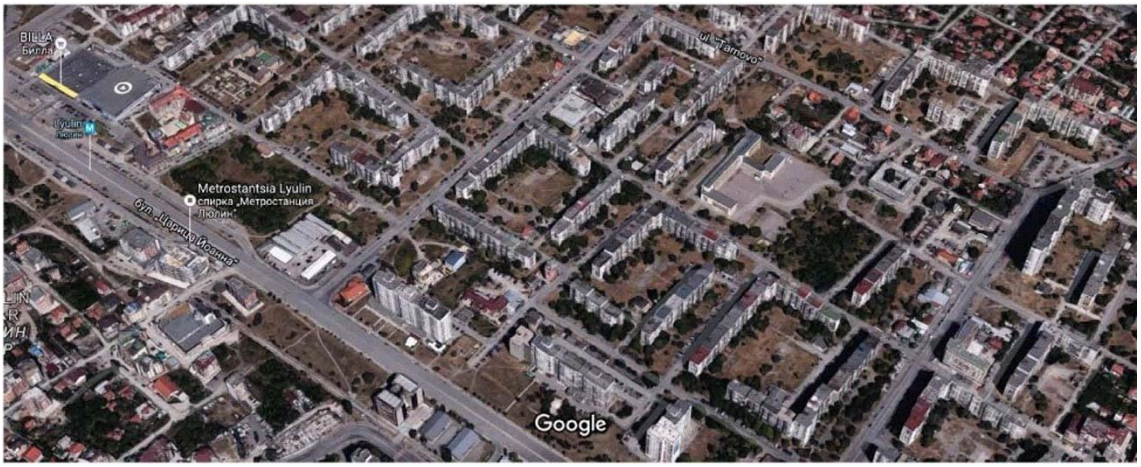

Figure 2. Housing Estate Lulin, Sofia

The analysis of the available housing stock and its use shows:

1. Statistically Bulgaria has a sufficient number of dwellings. The value of the average indicator "number of dwellings per 1000 people" (551/1000) brings the country ahead of the developed European economies (420/1000);
2. The location of the housing stock is inconsistent to employment – as a result every seventh dwelling is uninhabited, over 170000 dwellings are overcrowded and over 50000 dwellings are densely populated;
3. The status of the existing Bulgarian dwellings is critical due to the poor quality of the construction and particularly the chronic absence of an adequate management and maintenance system for the the dwellings;
4. The share of owner-occupied dwellings is overwhelming – more than 97% rental housing is virtually absent, which is a major problem for the country's housing policy;
5. Residential buildings in Bulgaria have extremely low energy efficiency.

The main conclusion is that **Bulgaria does not need a massive new housing construction.** The priority needs are in three other directions:

– renewal of the existing fund;
– restructuring the ownership of the existing housing stock;
– provision of social housing for marginal groups through limited new construction and adaptation of existing building stock.

Pilot Case: "Zaharna Fabrika" Housing Renovation Project

Figure 3. Zaharna Fabrika estate before the reconstruction

This pilot project is still the only example of a purposefully conducted operation to test all the interconnected stages that address the problem of energy efficient reconstruction of the existing condominium building by establishing a homeowners' association to carry out the renovation and subsequent management of the building. The pilot project involved an energy-efficient housing renovation by use of a subsidized loan, energy auditing, and building certification. As a unique pilot case for Bulgaria, in the period 2004–2008 this project was published in a large number of Bulgarian and international presentations, publications, seminars, etc. It was also disseminated and analyzed in relevant housing research projects of the European Commission - Inofin, Rosh, Reshape, in the related documents of Dutch International Guarantees for Housing (DIGH) etc.

The project aims to improve the management and maintenance of existing condominium buildings (Figure 3) by applying an efficient organizational and financial model for energy efficient reconstruction/energy efficient rehabilitation and a subsequent management of these buildings by newly established homeowners'. The renovation of the apartment building increases the standard of living, reduces energy costs and facilitates the future maintenance of the property. A logical outcome is also the increase in the market price of the renovated building.

A key moment for the successful implementation of the renovation project of the pilot building – bl.10, housing estate "Zaharna fabrika", Ilinden district of Sofia – was the establishment of effective interaction between project consultants and homeowners. The willingness to cooperate and the involvement of the apartment owners was the decisive precondition for achieving the end result, namely better housing, cheaper maintenance of the building without additional financial burden for the homeowners.

The project was carried out by Dutch housing associations together with Bulgarian consultants in the field of sustainable urban and housing development under the leadership of Dr. Georgi Georgiev. The participants in the project found that the management and maintenance of residential condominium buildings in Bulgaria suffer from a chronic lack of adequate legal and organizational form. As well known, the problem of maintenance of common areas such as staircases, roofs, facades, engineering installations are extremely harsh and leads to the increasing degradation and decapitalization of buildings and surrounding areas. Defects in the amortised infrastructure also lead to compromising the structure of the buildings, the increased risk of fire, and so on. As a result of the preliminary study, the project partners concluded that the Dutch model of multi-storey apartment building management by owners' associations could be a good starting point for finding a sustainable solution in Bulgarian social and spatial environment.

The implementation stages of the project were as follows:

1. Selection of a pilot object – a condominium building;
2. Gathering the apartment owners of the designated building into a legal entity – a homeowners' association;
3. Developing jointly with the association of the owners a specific financial and technical scheme for carrying out the reconstruction for the designated building. The guiding principle of funding was that there should be no increase in building's running costs – loan repayment costs are to be largely covered by the energy savings achieved as a result of improved thermal insulation;
4. Appointing of an appropriate funding institution. Thanks to the support offered by Dutch housing associations, involved in the project, a Dutch Guarantee Fund (DIGH) has been invited to finance the project with a low-interest (soft) loan;
5. Signing a contract for the financing of the reconstruction;
6. Negotiating a contractor for construction work;
7. Supervision of the maintenance of the renovated building and repayment of the loan.

The implementation of the project began in February 2003 with Dutch housing experts visiting Sofia to evaluate existing multi-family residential buildings that would be suitable for a pilot project. Together with the Bulgarian experts, the region of the so called "Workers Homes" – Zaharna Fabrika housing estate was selected. In the coming months, the overall financial, technical and legal aspects of the project have been developed. In September 2003 the project was presented to the residents of the neighborhood with the active assistance of the municipal administration of Ilinden district of Sofia. Owners' opinion surveys took place in different buildings and the information received was analyzed. As a result the block 10 was selected as a pilot building. A crucial role for the selection took the commitment and consent of all the apartment owners from the building to participate in the project.

At the end of 2003, an "Association of homeowner of block 10" was registered by Sofia City Court in accordance with the provisions of the Law on Non-Profit Legal Entities – the first of its kind in Bulgaria organization/legal entity of homeowners in multifamily residential building.

On the basis of the survey data and discussions with the owners of block 10, the specific financing model was discussed. A project with financial and technical part for implementation of the reconstruction was developed. It was assumed to perform complete thermal insulation of the external walls of the building and reconstruction of the attic space by upgrade and thermal insulation of the roof structure. Two shared-owned ateliers were allocated in the upgraded underroof area (Figure 4). They were targeted for rentals in order to cover a part of the loan repayment. As a result, the entire building was renovated to class "A" for energy efficiency (Figure 5). In addition to renovated dwellings, all the attic rooms of the individual apartment owners were reconstructed with a raised and completely replaced roof structure and fitted plastic window frames. Sofia Municipality, which was supporting the project, contributes to the achievement of the project goals by financing the development of the adjacent area of 1the renovated building[3].

Figure 4. The pilot building under reconstruction

Figure 5. Renovated pilot building

[3] Project video information can be found on Youtube: https://youtu.be/RIesgWP_z2I, https://youtu.be/21IrhKz4LcA.

Pilot Case: Competition project for renovation of a typical large panel building in Sofia

The "New Life for Panel Complexes" competition was organized by ARHMODUL, a platform for architectural and thematic competitions and announced on 11 April 2011 on the ARHMODUL.COM website, with a deadline for submitting the projects – 15 June 2011. The results were announced on 1 of July 2011. 34 projects were presented to the jury of this innovative contest.

First prize in the competition was awarded to the team headed by arch. ATANAS KOVACHEV, Corresponding member of the Bulgarian Academy of Sciences, Doctor of Science, Professor, Foreign Member of the Russian Academy of Architecture and Building Sciences and Honourable Professor of the Moscow Institute of Architecture. Additional members of the winning team were IRINA ANGELOVA, MILEN SARIEV and KREMENA DINEVA.

The theme of the competition was extremely important for Bulgaria. For more than 20 years there have been talks about rehabilitation of panel complexes and little has been done. Bulgaria is seriously lagging behind in the renovation of the panel buildings. It is important to emphasize that the judging of the competition projects was done online and the competition was completely anonymous.

The winning project interpreted an old idea, published by professor Kovachev in his urban planning publications, that offered a different approach towards redevelopment of panel buildings. This idea was based on the belief that besides the technical and economical issues related to building renovation (thermal insulation, new windows and facade coloring), we should also have to look for other ways and means to bring back the panel buildings to a comprehensive new life. The main project idea consisted of building additions – enlargement of the building through adding-up of building thickness and/or building lenght, upgrade of the existing flat roofs, spectacular roof and facade landscaping. This approach also has led to increased living area, improved structure stability of the building, the use of modern building materials and finally, besides from improved energy efficiency a new architectural appearance was attributed to the panel building (Figure 6).

The project authors realized that the implementation of the project idea required, besides the financial means that can be sought from different sources, also the consent of the apartments owners within the renovated building. But the project team sticked to the understanding that this is the only working approach, that could solve not only the utilitarian problems of energy efficiency and structural soundness, but could create an outstanding architectural impression. The practical project Implementation could be based on a public-private partnership approach. An important point in the overall concept was roof and fasade landscaping.

Figure 6. Panel building renovation proposal

The selected pilot panel building was the first realized panel block with internal drainage of the roof; the staircase was poping up to the facade and was a major element in the composition; the entrances of the building were designed as geometrical boxes. The project proposal preserves and integrates the existing architectural accents of the building into the new project proposal.

The advantages of the building after proposed renovation are:
– each floor improves the energy efficiency of the apartments independently;
– all entrances on the main street perform public functions, even the first floors;
– the balconies from the south are preserved, richly landscaped, while those from the north are glazed, which reduces the dominant role of the staircase in the composition.

The concept of the project in five steps:
– the great potential of the solution lies in utilizing of the turbots of the building;
– adding of new rooms to the respective apartments in the "dead spots";
– winter gardens on the north, extended terraces to the south;
– the whole space is designed on a modular principle.

Principles of the project proposal:
– transformations in building layouts – the comfort of living improves by giving more space to the apartments;
– microclimate conditions improved, reducing energy consumption;
– inhabitants can stay in the apartments while refurbishment is going on;
– the project is implemented without major interference in the concrete bearing structures.

Structural solution:
– combination of steel and concrete construction;
– separate foundations for new building extensions;
– connections to the existing structures are carried out at the level of the floor structure;
– the energy efficiency of the building is ensured by extinguishing thermal bridges through vertical joints/spaces between existing and new construction;
– separate solution for console terraces (balconies).

The project proposal offered a conceptual architectural solution that has the potential for large scale implementation, unlocking the capacity of the panel buildings.

Conclusion. Bulgarian prospective mass housing

The problems of the housing environment inherited from the period of the centralized planned economy are further exacerbated during the transition period after 1990. All these problems call for a permanent, long-lasting and synchronized policy aimed at harmonizing and normalizing the housing estates in social, psychological, cultural and economical terms. In general, it is necessary to overcome the alienation of the inhabitants of their environment. It is necessary to create a sense of stability and security for the inhabitants, for ownership, to ensure the construction capabilities of the next generation. The self-identification of the residents with their environment in all aspects – from cultural-psychological to legal-economic, – will motivate them in a creative way.

It is also necessary to create and stimulate the action of neighborhood microsocial structures, of a common social life, of legitimizing the civic activities, of the inhabitants and their inclusion in the processes of creation, renovation, maintenance and construction of the environment. Providing of land ownership and building opportunities is a great opportunity in this respect, but it is also a serious problem with psychological, motivational, planning, spatial, environmental, regulatory, legal and financial issues.

Restructuring and renovation of housing estates in Bulgaria is a major challenge for the development of Bulgarian cities. It is a significant change in many aspects in a massive pattern of habitation – a difficult but inevitable process.

Large scale housing estates (complexes) from the 1960s and 1970s, built on green land, embody the principles of "free planning". They need urgently:

1. urban regeneration action;
2. energy efficient renovation and subsequent proper maintenance of the building stock.

Regeneration is a major urban redevelopment operation designed to make housing estates (planned in different social reality) adequate to contemporary market conditions. This means the realization of a synchronized package of activities – addressing the territory to the respective owners (new regulation), creating a system of public, semi-public and private spaces, organizing the infrastructure in accordance with the new regulatory division, completion the infrastructure (including the social one), creating conditions for new construction, mainly in the sphere of small business and services. These activities must ultimately cover housing estates in a spatial network and a system of relationships similar to those in the traditional urban environment.

The modernization and maintenance of the housing stock in these estates is about replacement of the installations, seals, thermal insulation, waterproofing and other repairs of the buildings. The buildings are built by industrial technologies (mostly large-scale panel), many of their elements are already defective or, in the first place, have poor thermal, noise-proof, microclimatic and aesthetic qualities.

Small housing estates (complexes) (built on existing urban neighborhoods or villages). In the complexes built on existing urban neighborhoods, due to the fact that their composition reflects the existing street network and hence the neighborhood structure, the problem of restructuring is not so acute. They would be more likely to adopt a return to the traditional urban environment. The buildings there also need retrofit, as they also give defects and need improvements.

The opportunities for densifying the housing in residential complexes are minimal. They are dimensioned at good balance and additional infill housing development would worsen their quality.

Source of Illustrations

Fig. 1. Condominium housing in Sofia downtown. Source: Personal archive G. Georgiev.
Fig. 2. Housing Estate Lulin, Sofia. Source: Google maps.
Fig. 3. Zaharna Fabrika estate before the reconstruction. Source: Personal archive G. Georgiev.
Fig. 4. The pilot building under reconstruction. Source: Personal archive G. Georgiev.
Fig. 5. Renovated pilot building. Source: Personal archive G. Georgiev.
Fig. 6. Panel building renovation proposal. Source: Personal archive A. Kovachev.

Источники иллюстраций

Рис. 1 Квартирный жилой дом в центре Софии. Источник: Личный архив Г. Георгиева
Рис. 2 Жилой комплекс Люлин, София. Источник: Google maps
Рис. 3 Жилой район Захарна фабрика до реконструкции. Источник: Личный архив Г. Георгиева
Рис. 4 Пилотный дом в процессе реконструкции. Источник: Личный архив Г. Георгиева
Рис. 5 Пилотный дом после реконструкции. Источник: Личный архив Г. Георгиева
Рис. 6 Panel building renovation proposal. Источник: Личный архив А. Ковачева

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