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Research Article

METHODS OF MODERNIZATION, RENOVATION AND RECONSTRUCTION OF HOUSING AND BUILDINGS

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Matkarimov Nuriddin Xusniddin o'g'li
Master's student, Fergana Polytechnic Institute, Fergana, Uzbekistan

Rahmonova Gavharxon Abdumalik qizi
Master's student, Fergana Polytechnic Institute, Fergana, Uzbekistan

Rahmonov Dilmurod Maxamat o'g'li
Doctoral candidate, Fergana Polytechnic Institute, Fergana, Uzbekistan

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ABSTRACT

This article talks about methods of modernization and reconstruction of residential and public buildings. The level of spiritual wear and tear of buildings, moral static and physical, functional wear.

KEYWORDS

Construction, semi-detached, panel building, toilets, modernization, renovation, reconstruction, integrality principle, systematic approach, revaluation method, adaptation method.

INTRODUCTION

Based on the experience gained in our country and foreign countries, it should be noted that today the reconstruction of buildings is the first issue. 20-30% of all the funds attracted to the

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construction sector fall on the new capital construction sector and the rest is spent on the reconstruction and modernization of buildings based on the plan. It should be noted. These funds are aimed not only at increasing the capital of the buildings and ensuring their reliable operation, but also at preventing their spiritual wear and tear [1-3]. According to the information of UNESCO, the spiritual wear and tear of buildings in the world occur every 8 years. In such a situation, the reconstruction of buildings is focused not only on its spiritual wear and tear but also on increasing their comfort [4-9].

It can be seen in the example of several developed countries that the contribution of funds spent on the reconstruction of buildings is very high. For example, this indicator is (Sweden - 40%, Finland - 51%, France - up to 60%, Germany - 30-40%, in Great Britain - up to 60%). The main part of the spent funds goes to residential buildings, and the rest goes to public and administrative buildings.

During the reconstruction of residential buildings, as one of the main tasks, changes are being made to their architectural-planning solutions, taking into account the socio-economic situation and methods of reconstruction in the area (city, district, quarter) where they are located [10-17].

The reconstruction method of the building is a group of neighbours. the following (town planning, architectural planning, social) problems can be included in them. Each object to be reconstructed has its solution, taking into account its location in the city, as well as its technical condition. The last factor can sometimes take the main place in making a decision. If the building's moral and physical deterioration is high and its restoration is not economically acceptable, it may be proposed to demolish it and build a new building instead [15-19]. The following factors also play an important role in the reconstruction method of the building: the age of the building (the time it was built), its constructive-technological and architectural-planning features, and the construction materials of the load-bearing and barrier structures at the time of construction. and how the quality of work was done. In the total renovation and reconstruction of residential buildings, it is envisaged to solve the following issues:

- Change the main construction parameters of the building, height (floors), construction of two-story apartments, construction of mansards, construction of separate volumes and sections as additions to the building;
- Improvement of the architectural and artistic qualities of the building based on the general composite solution of the building area and modern aesthetic requirements;

In this, as the main issues, it is necessary to focus on solving the social problem with the establishment of infrastructure, taking into account the wishes of all layers of the population, and ensuring an ecologically healthy living environment.

Based on experience in the development and implementation of projects for the renovation of the first gross series of residential buildings, they

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can be divided into several groups depending on their level of complexity:

- Without changing the typical design solutions of residential buildings, to ensure the reliability of their load-bearing structures and increase the quality of their use, to carry out their reconstruction;
- Without changing the typical project solutions of residential buildings, re-planning the rooms in them and improving the quality of their use, and their reconstruction;
- Without changing the construction size of residential buildings, within one section of apartments, by changing their structure (by combining apartments as much as possible) and carrying out their reconstruction;
- Restructuring and reconstruction of residential buildings by introducing additional volumes (adding to volumes, building an additional mansard floor, building a two-level apartment);
- To change the structure of residential buildings (adding to the volume, building additional floors, building a two-level apartment), changing the structure of the apartments and carrying out their reconstruction;

Keeping the main functional function of the building, its architectural-planning volumes with enlargement of fixed constructions, their reconstruction. Such a technical approach provides an opportunity to choose an optimal planning solution (rearrangement of rooms) at any stage of the period of use (dynamic increase of the family, social level of residents, economic opportunity) [20-24].

In the course of renovation and reconstruction of residential buildings, it can be done by moving the residents, partially moving them, returning them after reconstruction, and completely moving them and providing them with a new apartment.

Renovation or reconstruction of residential buildings, changes in their dimensional and structural solutions (replanning of rooms, strengthening or replacement of structures, adding additional volumes to the building (addition), adding to the building including adding additional floors (addition), placing additional volumes between buildings (insertion), improving the condition of building facades, creating modern interiors). Today's approach to building reconstruction can be divided into two main directions:

1) Without changing the primary dimensions of the building, determining their volume-planning solutions;
2) Changing the primary dimensions of the building and determining their volume-planning solutions.

The reconstruction of buildings is focused on the implementation of several engineering tasks, which can include the following; from strengthening the foundations of buildings and strengthening their foundations, to increasing their height and rational use of underground volumes. Based on the leading experts and the existing experience of reconstruction, the following methods of renovation of residential

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buildings can be determined: adaptation method; internal-reconstructive; external-reconstructive and revaluation method.

The adaptation method- refers to the method of achieving optimal values of the functional planning of the building, functionally redistributing the area and rooms, as well as technological and engineering equipment.

Internal-reconstructive method- without changing the dimensions of the building, redistribution of existing rooms in it, effective use of underground and attic space (as far as possible), excess space and rooms.

External reconstructive method- by changing the dimensions of the building and its volume-planning solutions, adding additional areas (insertion) to the rooms and sections, making additional constructions from functional planning blocks to the existing buildings (addition), or increasing their height (addition), and the method of demolishing a building and building a new one instead.

The revaluation method- refers to the method of changing the functional function of the building. This method can be partial or complete. The method of partial revaluation is carried out when the building has two or more functions, in this case, the redundant functions in the building are carried out by moving them to another building.

There are two aspects of the reconstruction of residential buildings: the principle of integrity, a complex review of the influence of external and internal factors during the use of the building; Systematic approach - in which the most optimal solutions of reconstruction technology and methods are selected. As the main issue during the renovation and reconstruction of residential buildings, it should be focused on improving the characteristics of its use, improving the heat transfer of the barrier structures in the building, and first of all, reducing their energy consumption. One of the important stages in the reconstruction of buildings is their variant design. According to experts and scientists in the field, the quality of the project-estimate documents makes up to 60% of its implementation. It is considered that the reconstruction of living areas does not lead to deterioration of insolation (sunlight) and aeration (ventilation) problems there, but it serves to improve the microclimate of the area, increase comfort and healthy lifestyle. It is a comprehensive approach to the reconstruction of the square, in which the renovation, reconstruction and demolition of the building should be aimed at one specific goal, that is, the improvement of the outdated fund on the square, based on the modern requirements of urban planning. Experiences of foreign countries in the renovation of residential buildings: it is considered to serve to increase comfort and a healthy lifestyle [21-23]. It is a comprehensive approach to the reconstruction of the square, in which the renovation, reconstruction and demolition of the building should be aimed at one specific goal, that is, the improvement of the outdated fund on the square, based on the modern requirements of urban planning. Experiences of foreign countries in the renovation of residential buildings: it is

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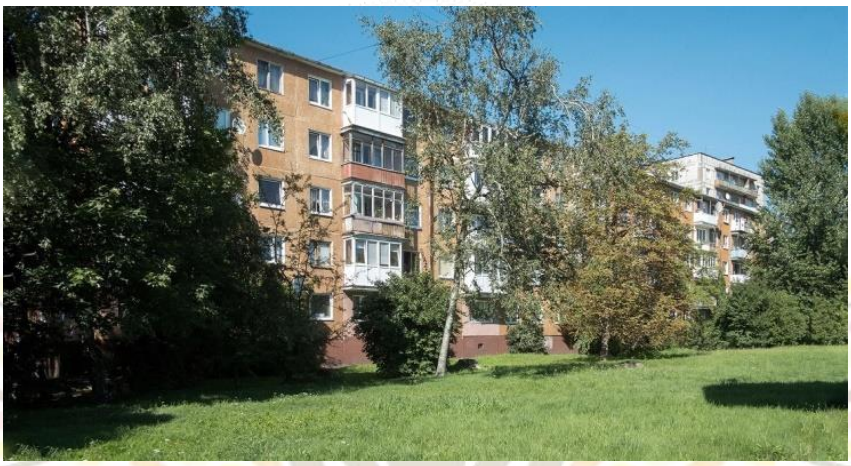

Figure 1. Condition before renovation

Figure 2. Condition after renovation.

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Figure 3. Condition before renovation

Figure 4. Designed by Stefan Forster Architekten in Leinefeld, Germany.

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Figure 5. Condition before renovation.

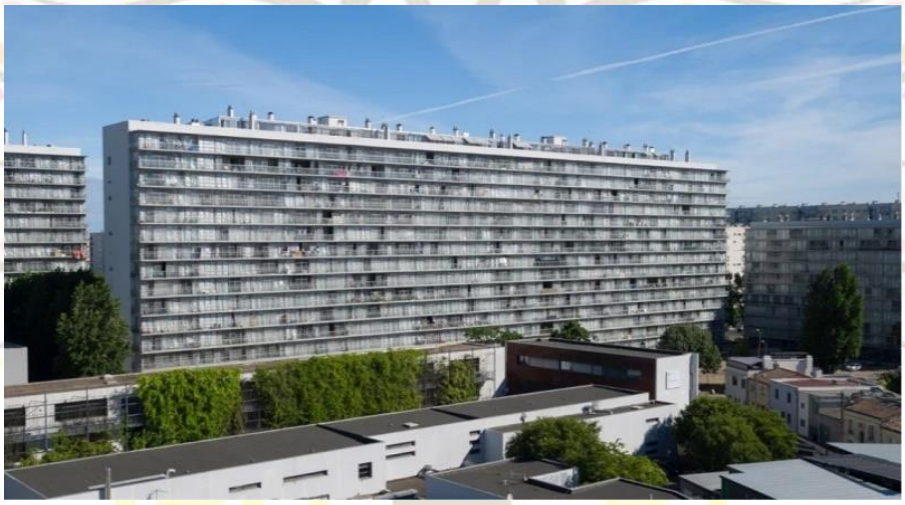

Figure 6. Bordeaux, France. Designed by Lacaton & Vassal

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Figure 7. Galle, Germany. Designed by Stefan Forster Architekten

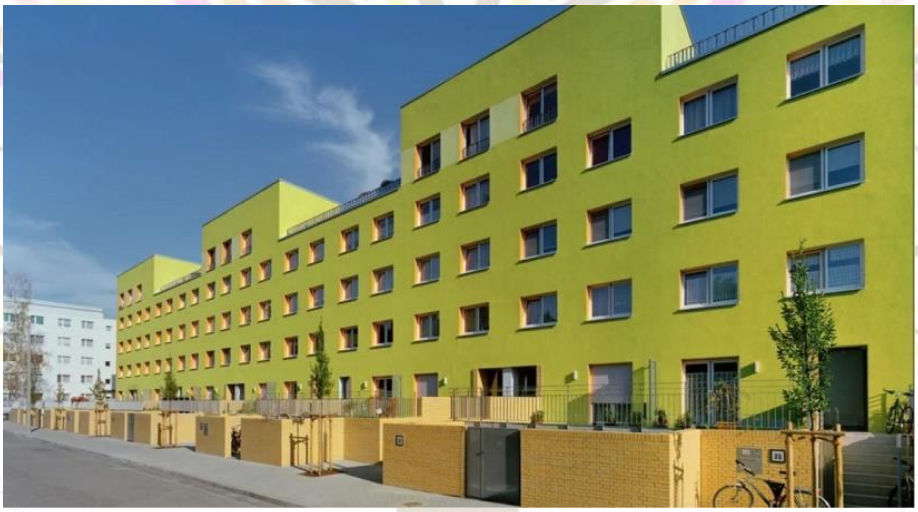

Figure 8. Galle, Germany Condition after renovation

CONCLUSION

The analysis of the architectural planning solutions of the first two "generations" of multi-story large-scale panel residential buildings, which were built, showed that there were many negative aspects that were allowed, including: disadvantages.

The main disadvantages of spiritual wear and tear in buildings are: the small area of the kitchens in them; combined bathrooms in small areas; low sound protection of internal walls and partitions; as a result of violation of the heat-humidity regimes of the living rooms, discomfort in the rooms; uniformity and lack of visibility of building facades.

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The reason for the moral obsolescence of five-story buildings is the fact that they were built as only one type of sectional buildings, the failure to take into account the demographic, historical and architectural traditions and climatic characteristics of the places where they are located. Filling the area with such buildings is also explained by the fact that the natural landscape and architectural features of the environment are not taken into account.

The influence of the following factors on the level of spiritual wear and tear of buildings was also great: architectural-planning solutions; different building heights; the ratio of the sizes of the rooms; total areas of apartments; area of rooms per resident.

The following methods of modernization of buildings are the most acceptable: adaptation method; internal reconstructive method; external reconstructive method; including revaluation methods.

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