Architectural features of modern low-rise housing for large families in Russia (on the Rostov region example)

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Abstract. The main direction of the Russian demographic policy is to increase the number of large families by stimulating this category of the population with numerous federal supporting programs, including those aimed at improving the level of housing provision and comfortable living conditions. The research on certain aspects of housing design for large families was carried out by a number of authors, but a single concept has not yet been formed. This article discusses the development of housing architecture for large families, starting from the Soviet period, the main types of modern buildings of this housing type, the methods of organizing apartments in different urban conditions, as well as the typological features that affect the modern housing architecture formation for large families.

Introduction
Russia occupies the 60th place in the world in terms of living standards and the 95th place in providing housing [1]. The number of low-income people is approaching 50%. Currently, families with many children are the least socially protected and in dire need of providing decent housing conditions. In modern Russia, the status of a large family as a family raising three or more children, including adopted children, is legally defined. The following forms of large families exist: traditional families (raising their own children), “professional” foster and foster families, as well as mixed families, where, in addition, the relatives, orphans or children left without parental care are brought up. But regardless of the composition complexity of a large family, there is an urgent need to provide these families with comfortable housing, with a full and safe environment that meets all modern needs, both adult family members and children at all stages of their development. This, in turn, creates the prerequisites for the development of recommendations and the architectural concept formation of a modern home for large families.

Main part
Large families are legislatively provided with land in suburban areas and rural settlements, both for rural and urban families, social housing or a loan for the commercial housing purchase. The gradual increase in the number of large families and the variety of problems associated with the peculiarities of their lifestyle, both in urban and rural environments, poses the new challenges for the architectural typology, since the problems in the design and construction of an apartment and a house for large families have not been specifically studied and not developed [2]. In 1992, the Government of the Russian Federation launched a program for providing benefits for large families, which provides
for the allocation of farms land, small enterprises and other commercial structures, the allocation for large families of the garden plots, loans for the farming development; the possibility of part-time work, work at home, the organization of training and retraining, taking into account the needs of the regional economy. In 2003, a law on the free provision of land to large families was implemented, the status of a large family as a family raising three or more children, including the adopted children, was determined. In 2008, a law on the allocation of federal lands for the construction of settlements, new settlements and large residential areas appeared in existing settlements throughout the country and in the Rostov region, was implemented. According to the calculations of demographers A.I. Antonova and V.A. Borisov, to maintain the expanded reproduction of the population, the proportion of families with three children should be 30%, with four or more - about 31%, that is, a total of over 60%. Currently, the number of families with 3 children is only 3.72% [1]. The measures taken by the government gave the result - the number of large families in Russia from 2010 to 2017 increased by 25%. Currently, the benefits for large families include: the provision of apartments in apartment buildings on long-term rental terms; housing subsidies for the low-income large families; young families, agricultural specialists in rural areas, doctors, municipal employees; land provision.

For individual housing construction, the land plots from 0.02 to 0.15 ha are provided; for conducting the personal subsidiary plots - from 0.08 to 1 ha, for creating a farm - from 0.2 to 1.0 ha. The land plots for urban and rural large families are provided in the villages around the cities and in rural areas. The Association of Large Families of the Rostov Region determined the following requirements for large families in connection with their relocation to the countryside: providing jobs, cultural services, creating a full-fledged comfortable living environment with engineering landscaping, parks, and playgrounds [3].

Therefore, one of the priority areas is to increase the availability of housing per one person, the number of rooms in apartments, the comfort of living, according to the example of the EU countries - to increase the population self-employment.

Many authors in Russia studied the experience of designing housing for families with children in the 1980-1990s: B.R. Rubanenko, K.K. Kartashova, D.G. Tonsky [4], V.M. Molchanov [5]; aspects of designing a mass housing for families with 1-2 children were considered. Since the 2000s and to date, the features of architectural and planning decisions of houses and apartments were considered in their works: in the field of commercial housing M.V. Blagovoi [6], in the field of social housing - K.V. Grebenshchikov [7]. In these works, the degree of comfort for a mass dwelling was determined, especially the types of dwellings for low-income families with children in cities, and the relationship between the social groups of families and housing. N.D. Potienko considered the architectural and planning features of the apartments and houses for socially vulnerable families, including large families, in urban conditions [8].

An important aspect in the architectural formation of urban and rural dwellings is regional features. The suggestions in this direction were made in 1980-1990 by N.M. Soghomonyan, L.V. Khikhukhka [9], A.A. Makhkamov [10]. For the southern regions of Russia, the research in the field of regional low-rise housing was carried out by a number of authors in the thesis research (A.V. Seliverstov and others). In 1980-1990 On the basis of these studies, the “Catalog of residential buildings for construction in rural areas” was developed in the Rostov region. It presented the main types of single and semi-detached, blocked and sectional low-rise residential buildings for the mass use with the possibility of personal subsidiary farming. When developing the design concepts for rural housing in the 1980-1990s an idea to combine residential and industrial functions to solve the problem of providing rural settlements with public services at the expense of agricultural enterprises was put forward. In market conditions, this trend has been further developed. Since the 2000s the construction of houses with labor functions is possible at the expense of the citizens’ personal funds.

The combination of residential and production functions has developed historically, which currently make it possible to improve the financial situation of the family and the employment of the population. Thus, the changed socio-economic conditions require justification of a new approach to the labor function in housing (Fig. 1). To solve the problems of the architectural organization of a
dwelling for large families, the scientific studies of a dynamically developing dwelling for large and complex families in the urban dwelling of N.L. Rusanova and G.D. Platonov; for joint, separate and half-separate living in apartment buildings and in rural houses for large families - the works of A.A. Makhkamova and N.M. Soghomonyan were used. The construction of a large house is not available at the same time for most families. Therefore, the concepts of “growing” houses for complex and large families, proposed in 1990-2000, were studied by V.A. Novikov A.N. [11], A.N. Asaul [12], G.I Pustovetov [13].

In the USSR in 1980-1990s large families were provided with 5-6-room apartments in specially processed sections of multi-storey residential buildings; in rural settlements the residential houses were built at the expense of collective and state farms. Particular attention during this period was given to construction in rural areas: standards for rural residential buildings taking into account the regional characteristics of the country, northern, central Russian and southern regions and national traditions were developed. For the mass construction of the Rostov region in 1980-1990 the “Directory of residential buildings for construction in rural areas” was developed, which presented the main models of one- and two-apartment houses with 3-6-room apartments, in blocked and sectional low-rise houses, which provided for apartments of up to 4 rooms. At the houses there was the possibility of maintaining the personal subsidiary plots: in one-semi-detached and blocked houses - on a plot near the house, for the sectional houses - in the yard of the house, as a source of additional income. Depending on the plot size, the possible composition of pets that could be accommodated was determined. A feature of the planning decisions was the presence of a second entrance to the house, a second kitchen for cooking feedstuff.

During this period, the task was to provide the rural population with public services by placing various objects in residential buildings: doctors’ offices, paramedic and medical centers, shops, cafes, primary schools and kindergartens, consumer services, children’s entertainment centers, production facilities - workshops for repair, agricultural farms. In construction practice, these projects are not widespread. To take into account the possibility of increasing the family, the concept of “growing houses” was developed by transforming attics and outbuildings (Figure 1) [14].
Since 2008, housing for large families in Russia has been solved by building the children’s villages in the suburbs and rural areas and by small residential groups in large cities: in Moscow, St. Petersburg and others. These two directions developed in parallel.

SOS Children’s Villages - is an option for a family orphanage, mainly in rural areas, and residential groups of blocked, single and semi-detached houses in the suburbs of large cities - for foster and native large families. SOS Children’s Villages were designed according to the concept developed by the Austrian designer G. Gmeiner for foster families. In Russia, a study on the architectural and planning decisions of such villages was conducted by E.Yu. Peresvetov. The children’s villages from 2008-2010 started being built in the village of Tomilino, Moscow Region, in the city of Armavir, Krasnodar Territory, in the village of Petrovka, Myasnikovsky District, Rostov Region, and other settlements with state funds and charity. The villages were built for large families of 5 or more people with disabled children, using charity funds.

E.Yu. Peresvetov identified the main areas of the village development: 1) poorly concentrated residential groups in the micro-district; 2) concentrated residential groups - in rural settlements or suburbs of small cities [14]. In the second case, buildings of a service character were envisaged - for the administration and with sports and entertainment, medical, educational functions. Types of residential buildings – single, semi-detached and blocked.

In addition to villages and residential groups for guardians, a concept for placing families on 1-2 floors of apartment buildings with adjacent plots, in 2-level apartments for families of no more than 6-7 people with 5 children was put forward. In the locked houses of various configurations for the families of no more than 6-9 people with 7 children, and in 1-2 apartment cottages for the families of 10-12 people with 8-10 children were placed (Figure 2).

**Figure 1.** Multi-family residential buildings: 1) an experimental 9-story residential building for three generations (Tashkent Zonal Research Institute of Experimental Design) with a reserve building for development; 2) the plan of the house with access through the utility room for agricultural activities; 3) patterns of the house development horizontally and vertically; 4) schemes for combining the industrial and residential functions in the house; 5) an example of house development; 6) a house with a labor function (first-aid post)

**Figure 2.** Villages for guardianship families with many children: 1) a town for families with many children in the village of Raimenovsky, Moscow Region; 2) blocked residential houses for temporary resettlement of large families in Moscow, passage of the Birch Grove; 3.4) Victoria Village, Armavir
The apartments differed from the usual ones in the fact that a training room and a games room were added. The study and play rooms were divided into zones or rooms for younger and older children. The game room provided is the area for amateur activities (crafts, knitting, photo-making, embroidery) and a sports and game complex for younger children from 1.5 to 2 years. The game room was located near the kitchen, to be under the adults’ supervision.

In the study room there is a library and a place for the preparation of school assignments under the guidance of an adult for the children of primary school age. A sleeping room for a child under the age of three to five was provided in the parents’ bedroom; for the children aged 8-10 years, separate rooms with an area of 8-10 square meters are recommended; for the children of senior school age, a place for classes was organized in bedrooms, the area of which is 12-14 square meters.

The area of the kitchen-dining room for a family of eight to ten people provided for 18 square meters, kitchens - not less than 10 square meters. The number of kitchen equipment has doubled compared to the conventional apartments: two stoves, two sinks, two or three refrigerators, additional cabinets for drying and storing utensils, kitchen utensils, products.

The area of the living room for holding family-wide evenings, holidays, birthdays of children, Christmas trees, watching TV shows depended on the number of children - at least 30 square meters.

Household premises were expected more than in an ordinary house consisting of: an entrance hall with a bench for dressing children, a dressing room, a laundry room equipped with two washing machines, a workshop for repairs.

In Moscow and the Moscow Region, and in some cities of Russia, low-rise residential groups were built in micro-districts to provide large families and families with orphans with disabilities (Fig. 2). The houses were provided to the families free of charge, but only for the period of large families or until the time when it was time to get a permanent home. The family retained the former home, where the family could return or resettle the children of legal age. But a problem arose - in practice, it is more profitable for the Moscow authorities to leave a cottage for the family, even after the children have grown up, since providing an apartment can be more expensive.

In addition to the rental form of providing housing, other directions appeared - the provision of houses built with budgetary funds: in Shchebekino, Moscow Region - large-panel houses with co-financing - from the budget and own funds of the population, in the Vladimir Region - wooden houses of economy class in the basic version, budget account [15].

In recent years, private firms have been developing projects for large and families with many children, but most of them do not reflect the lifestyle of a large family, the age of children, the possibilities of changing the house with the growth and decrease of the family, the number of rooms simply increases. The main types of houses offered for large families, one- and two-apartment, as well as the blocked ones. The cruciform projects of blocked houses are offered - 4-apartment, ordinary, 4-6 apartment with the number of bedrooms no more than 4.

In the Moscow Region, in 2011, a catalog of single-family houses for large families was released, but it was negatively rated on large forums for the outdated solutions to facades and layouts, the lack of solutions with various options for increasing a house, insufficiently comfortable bathrooms and bedrooms, lack of places for games and sports, activities for children and adults.

Summary
Thus, the analysis of modern experience in the architectural formation of a dwelling for large families has revealed the architecture features of low-rise dwellings for large families. The revealed features will serve as the basis for creating a full-fledged architectural concept of a home for large families for the near future. A number of features that make it possible to structure this type of housing have been identified: by size and demographic type of the family (from 5 to 11 people, 3-8 of which are children, including relatives), by the residence place (in rural areas, suburbs and cities), by the comfort level of housing and living environment (economical, affordable, comfortable). The requirements that directly determine the typology of housing for large families and its concept as a whole are established: adaptability to the family growth dynamics and placement of labor functions in the structure of a
housing unit depending on the place of the family’s residence. In modern conditions, the typological diversity of the low-rise housing forms and the types of cultural services should provide decent living conditions for large families.

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