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RETHINKING SOVIET ERA MASS HOUSING IN KAZAKHSTAN

Niyaz Sarzhanov [1], Department of Architecture, Satbayev University, Almaty, Kazakhstan
Thomas Schurch, School of Architecture, Clemson University, Clemson, South Carolina, USA

Mass high-rise, tenement housing in former Soviet bloc countries, built within the modernist genre, has proved to be problematical throughout the history of architecture and urban planning. This study addresses features of mass housing in the former Soviet state of Kazakhstan, in which planning, artistic, psychological, social, and urban aspects of housing have resulted in the inhabitants' diminished quality of life. The study's findings reveal specific critical problems regarding typical tenements in Kazakhstan for their inhabitants and for the urban environments they occupy. An interdisciplinary approach reveals both negative and positive characteristics of various types of Kazakh mass tenement housing, with an emphasis on the former. The paper addresses some potentialities and recommendations for renovation that would enhance the quality of life in the urban setting.

***Key words*: renovation, mass housing, housing adaptation, urban renewal, regeneration.**

INTRODUCTION

The design of housing and the experience of community are integral parts of human civilization, which require special attention in a rapidly urbanizing and changing world. Throughout its existence, humankind has sought to surround itself with all the available benefits associated with safety, comfort, and therefore quality of life. In addition, housing – or a dwelling – has historically been an environment not only of protection and separation from a potentially dangerous world, but also a means of gaining experiences of *place* that are requisite to the human condition. With the growth of cities, and changes in technology and construction methods, large numbers of people are being housed in high-rise apartment buildings, which are significantly different from the living environments that were previously common. This is particularly the case in countries with a centralized authority dictating housing outcomes. The impetus for the dramatic change in the housing paradigm was an outgrowth of industrialization, resulting in the need to house large numbers of people flocking to urban areas, in concert with the modernist trend reflected in Le Corbusier's famous – but myopic – slogan "a house is a machine for living".

In different countries, the construction of high-rise housing has received varying degrees of distribution and design intervention. To a lesser extent, housing of this type was built in Western Europe (Freeman, 1993), and to a greater extent in Eastern Europe and The United States, but Le Corbusier's ideas reached their highest level in the countries of the former Soviet Union. Le Corbusier's edict that deemed housing to be a machine for living, found its application in Kazakhstan as a former satellite country of the Soviet Union, along with inherent deficiencies in the housing stock. These areas of concern are the focus of this paper, along with an investigation of how to enhance the residents' quality of life. To date, studies within the literature devoted to mass housing in Kazakhstan have been exclusively descriptive. The development of housing architecture and its typology are fully reflected in the works of Kazakh architects (Glaudinov *et al*., 1987; Samoilov, 2004; Kuspangaliyev, 2000; Kuspangaliyev and Samoilov, 2021). However, the problem of mass residential buildings in Kazakhstan has not been given due attention. Even in a fairly recent study on housing modernization, the authors consider reconstruction approaches without any in-depth study of the potential of existing buildings (Murzabayeva *et al.*, 2022).

HISTORICAL BACKGROUND

After the revolution of 1917, the Russian Empire was transformed into the Union of Soviet Socialist Republics.

[1] 22 Satbayev str., Almaty, 050013, Kazakhstan
sarzhanovn@gmail.com

Reflective of Communist ideology, the new Soviet government sought a bright demonstration of a "better future" for the inhabitants of this gigantic country, including the construction of affordable prefabricated high-rise housing as the best political strategy to this end. It is noteworthy that at the inception of the Soviet Union, the country was in deep economic crisis, and the decision to build cheap and efficient housing was the only option in this situation. Therefore, Soviet authorities and architects accepted the ideas of the modernists with enthusiasm, while at the same time discounting the importance of housing in the Communist system, due to its identification as a commodity, therefore making it an element of capitalist societies. Otherwise, the opportunity to provide each family and other inhabitants with their own living cell directly reflected the ideas of collectivist socialism. Therefore, cities throughout the Soviet Union – including in Kazakhstan – began to be built up with austere, multi-story apartment buildings.

Importantly, the development of standard designs in the Soviet system by design institutes created a "standard series of houses", which were built throughout the Soviet Union including in Kazakhstan, with only minor modifications related to local climatic conditions (Glaudinov *et al.*, 1987; Meuser and Zadorin, 2015). However, the layout and design of housing complexes were expedient, although they provided mere basic necessities that fell woefully short of the qualities and characteristics reflective of community planning and design. While collectivist housing was completed under Stalin, significant transformation and development of housing construction in the country occurred after the Second World War. This period can be called the beginning of panel construction, a building technology enabling the construction of housing from four to nine floors using prefabricated elements over a short time period. By the 1970s, Soviet architects had created a huge list of typical series of houses that were built until the 1990s, including in Kazakhstan. The period from 1970 to 1990 can be considered experimental in terms of Soviet housing construction. Therefore, in continuing the practice of standard design, the architects thought about complicating the shapes of buildings, increasing the number of stories and developing flexible planning solutions for apartments. Thus, the technology of panel construction was replaced by frame and monolithic construction. However, the neglect of master plans, sight plans, sight design, and the characteristics of compatible mixed use – most importantly at ground level and for street frontages – continued.

ISSUES – THE MATTER OF PATHOLOGY

Studying the impact of housing on its inhabitants' well-being and health began with the construction of apartment buildings at the beginning of the 20th century. Since the 1960s, social scientists have actively published findings of their research addressing problems related to living in apartment buildings, and especially in multi-story buildings. For example, Freeman (1993) systematized the current research practices and emphasized the negative effect of high-rise apartment buildings on their inhabitants. The main problems he identified were residents' high morbidity, the growth of crime, physical inconvenience, and social problems associated with the number of people living in one house structure, i.e., the number of flats per one entrance. Significantly, Freeman's work led to the identification of living conditions in high-rise buildings as pathological.

In more recent sociological studies (Gifford, 2007; Barros *et al.*, 2019; Clark *et al.*, 2007), the critique of high-rise buildings has continued. While the authors highlight gaps in research that do not allow comprehensive conclusions to be drawn, e.g., demographics associated with population diversity, residents' financial capabilities, gender differences, etc., the research findings are unanimous in concluding that apartment habitation in multi-story buildings adversely affects the residents' mental and physical health. Along with these findings regarding residents' well-being, clarification is required concerning references to multi-story dwellings *per se*, as well as determining which floor levels present unfavorable conditions for residents. To wit, most studies do not specify this nuance, but generally consider this to include housing above five floors. However, in their study, Larcombe *et al.* (2019) indicate that residents on the fourth and higher floors showed higher levels of strain and stress compared to residents on lower floors. The Larcombe study also carried out a systematization of all previous research addressing problems associated with living on the upper floors of a residential building. To this end, the authors confirmed problems previously revealed by a number of scientists (Amick and Kviz, 1974; Bagley, 1974; Black and Neill, 2014; Panczak *et al*., 2013; Rosenbaum *et al*., 2002), including social isolation, feelings of alienation, nervous disorders, depression, suicide, poor self-rated health, various psychiatric problems, a diminished sense of control and self-determination, and a lack of a sense of place. Furthermore, it is important to mention the results of work in the field of neuropsychology, for example, Ellard's (2015) findings address the relationship between the composition of urban environments and human health. His main conclusion is as follows: the human brain is evolutionarily accustomed to natural phenomena that are diverse and complex. Such environments are therefore regarded as a source of mental health. In this respect, a reasonable conclusion is that Ellard (2015) is referring to healthy natural ecosystems and, by extension, well designed built environments that take nature into account. Conversely, urban environments devoid of diversity and natural objects are harmful to their inhabitants' mental health, which includes poorly conceived housing environments that typify housing in former Soviet states, such as Kazakhstan.

Tangentially, and particularly noteworthy, are the adverse impacts upon children living on the upper floors. There are many studies devoted to this topic, which, like those on mental health, require the consideration of numerous factors (Fujiwara *et al.*, 2013). However, the importance of the findings cannot be denied. Oda *et al.* (1989) found that children living on upper floors showed a delay in the development of basic customary habits and characteristics, such as greeting, controlling urination, evacuation and tying their shoelaces. A survey conducted among mothers and kindergarten teachers showed that children living on lower floors *(the first four floors)* demonstrate more independence,

reduced frequency of separation anxiety, and fewer problems in controlling urination. The main conclusion of the authors of the study is that children living in high-rise buildings have a strong attachment to their mother, which becomes reflected in their further development. In their study, the authors emphasize that the level of socialization and independence decreases with an increase in the floor level. For instance, children living below the fifth floor are out of the dwelling longer than children on higher floors.

Considering housing, not as a spatial unit, but as the human environment in which people spend most of their time (Heidegger, 1971), the impact of the urban environment on the residents' health becomes obvious, as does the impact of the level of attention to complex planning and design, or lack thereof. Objects within urban environments are understood as those elements that are both public and private, with the former making up a diverse civic landscape – both built and natural – inclusive of various civic buildings, and the latter comprised of privately owned buildings and the areas in their midst. Alexander (2002) identifies 15 fundamental properties of urbanized environments, based on those found in nature. These properties, such as levels of scale, strong centers, thick boundaries, local symmetries and connectivity can be found both in natural environments and in the conventional architecture of different countries. Primarily and importantly, Alexander's work criticizes the architecture of modernism, since it lacks these properties; he deems it to be inhumane and therefore the antithesis of human evolution as cited above. Housing architecture in Kazakhstan deserves special attention in this regard, as more than 80% of multi-apartment housing belongs to Soviet modernism, which arguably is among the worst international examples of the modernist typology. Furthermore, Alexander's observations and conclusions are supported by Salingaros (2014), who evaluated the architecture of modernism with the help of mathematics, arguing that all natural objects have a common property – an organized, an inherent mathematical complexity that reflects the concept of natural systems that are inherent in nature. Salingaros (2014) demonstrates such organized complexity using the example of a fractal, whereby a large object consists of smaller objects, and all objects are interconnected. In comparison, the monotonous architecture of modernism, devoid of any small scale, is opposite to these properties. Thus, architecture that does not address the peculiarities of human perception vis-à-vis natural and built environments, e.g., the architecture of housing and its surroundings, negatively affects the inhabitant.

METHODOLOGY

This study is interdisciplinary in nature as related to the allied environmental design and planning fields or professions: architecture, landscape architecture and urban planning. The research and its outcomes rely on published data accepted for its significance and applicability within these fields, in addition to departures into environmental psychology, anthropology, and sociology. The method of examining the data, i.e., the literature, is essentially hermeneutical, i.e., interpretive. Therefore, the literature is studied and synthesized relative to the quality of life or deficiencies therein with regard to existing high-rise housing environments. Furthermore, the interdisciplinary approach compensates for the inherent ambiguity of understanding high-rise housing when a cross-disciplinary approach is lacking.

ARCHITECTURAL ANALYSIS

Mass housing construction in Kazakhstan, as in all former Soviet Union countries, began in the 1930s during the Stalin era. The first "series" of such housing was built from a wooden frame, with wooden ceilings, and walls filled with a reed-clay mixture. Currently, this housing type makes up a small portion of the housing stock in Kazakhstan (Bureau of National statistics, 2022), and most of it is in disrepair and, accordingly, subject to demolition. The predominant portion of housing development in the country is made up of panel, frame-brick and monolithic apartment buildings (Table 1).

The first series. The first series of tenements includes houses built from 1930-1950. Table 1 shows that the houses were both frame-reed and brick. In all of Kazakhstan, such houses were built on two floors, for eight families, and today they are used and inhabited in all Kazakh cities. These houses have the same layout and pattern of the bearing walls (Figure 1). There are two types of apartments on each floor: one-bedroom comprising 48 m^2, and two-bedroom at 62 m^2. The one-bedroom apartment includes a bedroom, a living room, a kitchen, a bathroom and a hallway. The two-bedroom apartment has the same composition, but with two bedrooms. The main difference is the material and thickness of the walls, which affects the thermal performance of the buildings and level of sound attenuation. Frame-reed walls have a thickness of 0.2 m and, accordingly, low sound attenuation and high thermal conductivity. Brick walls 0.5 m thick, on the other hand, are characterized by low thermal conductivity and high sound attenuation (Danilov *et al.*, 2004). A feature of these series is the compact

Table 1. Chronology of development of Kazakhstan's mass housing (Source: Authors)

Tenements	Years of Construction	Bearing Structures
Frame-reed. The first series	1930-1950	wooden frame
Brick. The first series	1930-1960	Transverse-longitudinal load-bearing walls
Large-panel	1960-1980	Reinforced concrete panels
Frame-panel	1970-1990	Reinforced concrete frame
Frame-brick	1970-1990	Reinforced concrete frame
Monolithic	1970-2000	Monolithic reinforced concrete

and symmetrical layout of apartments, unlit and narrow hallways, small bathrooms and kitchens, as well as poorly functioning and inadequate entrance space.

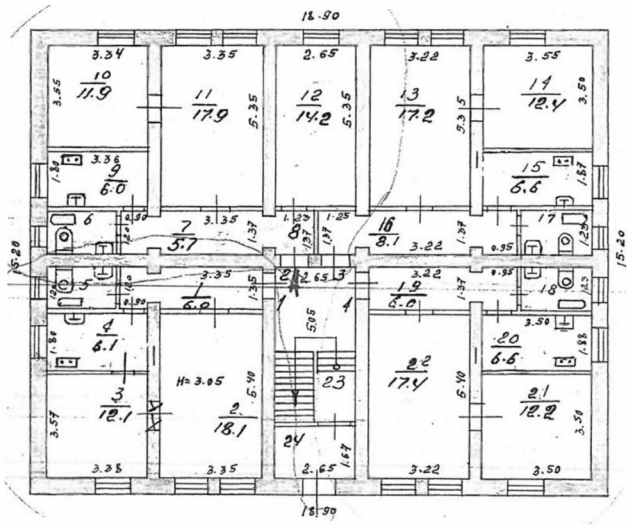

Figure 1. Brick tenement
(Source: NJSC "State Corporation" "Government for Citizens")

Large-panel, 464 series. Houses in this series have been built in Kazakhstan since the 1960s. Their structure consists of longitudinal and transverse load-bearing panels made of reinforced concrete. The ceilings are reinforced concrete slabs laid on the walls. The typical sections of this series and the floors are depicted in Figure 2, which means that all apartments have the same layout on each floor. This series was built in four-story and five-story versions, and based on the typical floor plan, several layout features can be distinguished. There are four apartments on each floor, the layout of which is largely a mirrored plan. The entrance space is limited by the size of the stairs, without any provision of elevators. The various rooms are cramped, and the kitchen area in each apartment type is 6 m^2 in size. The width of all rooms in the apartments is governed by the bearing wall locations, and it measures 3.08 m. The hallways in all of these apartments lack natural light. According to the original project, 3.6 m^2 of open balconies are provided, one for each apartment, which, as a rule, become enclosed by the residents themselves to add living and storage space. The facades in this series are distinguished by the complete absence of small-scale elements: decor, ornamentation, window frames, and a prominent entrance location or group.

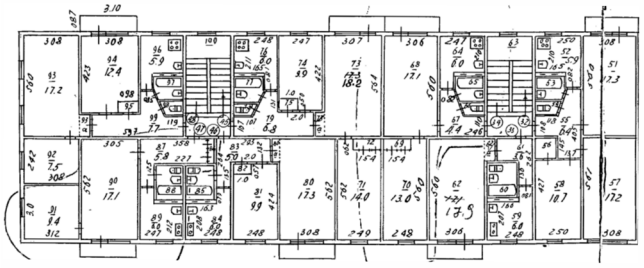

Figure 2. Typical floor plan of 464 series
(Source: NJSC "State Corporation" "Government for Citizens")

Large-panel, 147 series. Series 147 apartment buildings, and their modification, series 158, are an improved version of the 464 series. Construction of residential buildings with seven to nine floors began with a three-span scheme, i.e., two internal longitudinal walls. In addition to the reinforced panel structure system, this housing solution improved the planning characteristics, including having increased floor areas of the kitchens and bathrooms, the presence of loggias and increased hallway space. Compared to the 464 series – but noting the increased number of stories – this housing has one elevator per section, and three types of apartments distinguished by the number of bedrooms. However, due to the rigid panel structure, all floors have the same layout. The architecture of these buildings is devoid of small-scale elements from the first floor to the roof, and there are no accents or strong centers in the volume of the building (Alexander, 2002). Despite the large area of the ground level entrance space and its placement across the entire width of the building, panels divide the space into small areas devoid of natural light.

Frame-panel. A limited number of this type of tenement were built in Kazakhstan and therefore, in essence, it is not mass housing. Such housing can be found along large avenues in larger cities such as Almaty. A distinctive feature of this housing is its mixed construction, i.e., frame and panel (Figure 3). This allows for the organization of service functions on the ground floor and more flexible apartment layouts. The design utilizes a frame system of structures, with the panels on the outer walls of the building, without carrying the main load. Although the frame system made it possible to create flexible planning solutions, the houses, as before, retained the shortcomings of standard projects such as limited entrance space and repetitive floor plans, as well as facades lacking small-scale and therefore visually engaging elements. Generally, such apartment buildings are fundamentally different from their predecessors, but the lack of livability inherent in the architecture is still present.

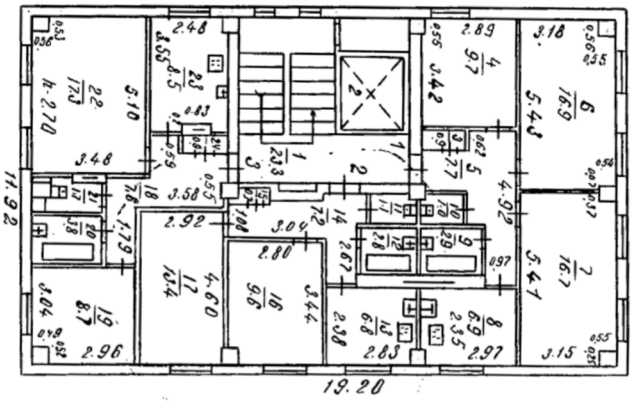

Figure 3. The floor plan of frame-panel tenement
(Source: NJSC "State Corporation" "Government for Citizens")

Frame-brick, VP series. The VP series is the most structurally resilient tenement in comparison with the housing previously described. The construction consists of a reinforced concrete frame with external and internal brick walls. This five-story housing has three apartments per floor, identical apartment layouts, and the same layout of entire floors within any given housing structure. Despite the frame structural system, the floor areas of the kitchen, bathroom, and the exterior entrances correspond to the areas of the panel houses previously described. The exterior entrance

space is limited by the size of the stairs – which are narrow – and there are no elevators, even though all the housing is five-stories. In the individual apartment layout, there is a 1.5-meter-wide hallway with a single separated bathroom in two-room and three-room apartments. In addition, each apartment has one open balcony, which is usually enclosed by the residents themselves, as with the 464 Series. Houses of this type are devoid of small-scale elements, e.g., there are no accents on the facades, windows or porches. Noteworthy is the lack of mixed functions on the first floors (ground level) – all floors of this housing typology are residential, including the ground level.

Monolithic tenements. By the 1970s, the technology of monolithic construction was actively implemented in Kazakhstan. Given the monolithic reinforced concrete structure, 12 story apartment buildings could be constructed, without caution related to the location, in the country's seismic zones. This housing typology has a common structural scheme: a central core in the form of a cross axis, where the elevators and stairs are located. There are four apartments on each floor, with identical layouts. Compared to the previous types of houses, the size of the hallways and kitchens has been increased to 11 m^2 and 8 m^2, respectively. In addition, there are two elevators and one smoke-free staircase for each housing tower (Figure 4). Open balconies are located on the four sides of each tower, again typically being enclosed by the residents. Although the monolithic construction technology is a transition to a new stage of housing architecture in Kazakhstan, houses of this type have retained a modernist and therefore sparse look. From the first floor to the roof, there are no accents on the facades, and no strong centers or thick boundaries, i.e. window frames, balconies' ornamentation, etc. (Alexander, 2002).

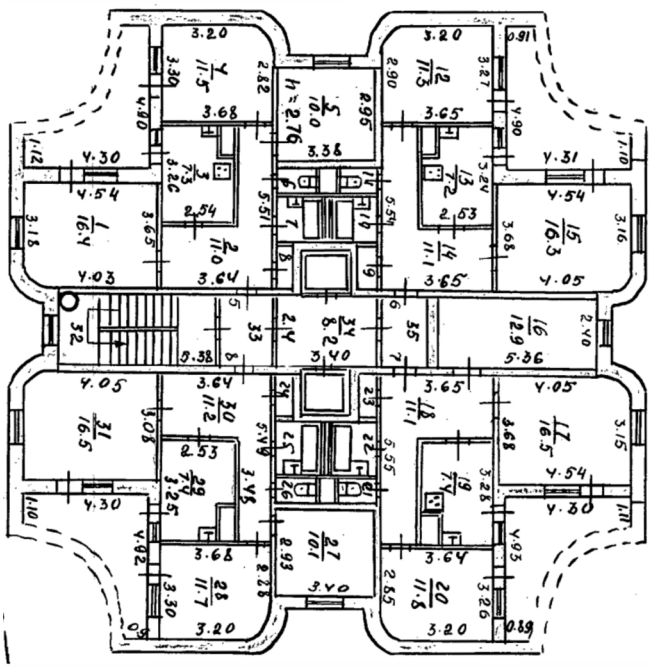

Figure 4. The floor plan of a monolithic tenement (Source: NJSC "State Corporation" "Government for Citizens")

URBAN PLANNING AND HOUSING DELIVERY

The term mass housing in all countries of the former Soviet Union is directly related to affordability and social policy. Initially, the Soviet government, when promoting the ideas of socialism, promised to provide every family with an apartment, to be completed and available as soon as possible. This policy was implemented thanks to the introduction of mass housing in the development of cities and within the modernist genre, which fitted well within a centralized and dictatorial government. In each region of the country, demographic studies were conducted, the results of which determined the amount of necessary housing and areas for settlements as deemed by the government. Thus, a five-to-ten-year construction plan was created, during which architects and builders had to fulfill the state order (Glaudinov *et al.*, 1987). After the housing construction, citizens would be assigned an apartment based on various government criteria. The prevailing number of citizens could get an apartment for free, by registering on a waiting list. This system, however, took an average of ten to fifteen years. Exceptionally, workers in the fields of education and healthcare received assigned housing that was free of the lengthy waiting period. Also characteristic of the system of centralized authority and, therefore, lack of free choice within the market, was the dearth of choice of housing and location of residence. Otherwise, citizens' social and marital status affected the assignment of apartments. Another delivery mechanism was to buy out the so-called cooperative housing over a period of five years, which was analogous to a mortgage. An extremely limited number of citizens could afford to buy cooperative housing. The purchase involved an initial payment of one third of the apartment's cost and further repayments over several years. As a rule, government employees, officials and other wealthy citizens chose such a mechanism. The concept of housing affordability, unfortunately, was applied to the buildings themselves and apartments, which have become cheaper due to the deterioration of the housing stock and living environment. Thus, the concept of affordable housing in post-Soviet countries is often associated with poor housing conditions.

To understand the features of mass housing in Kazakhstan, the placement of residential buildings in the urban environment should be analyzed. First and foremost, the essence of urban planning in the Soviet Union – and Kazakhstan's status as a Soviet satellite country – require explanation, as a determining factor in the development of cities within its centralized control and command economy. In support of the idea of functionalism, Soviet urban planning relied on a hierarchy of urban systems (Maloyan, 2004). The Soviet city, therefore, was regarded as a large "system" that included smaller "systems", e.g., a residential area, an industrial area, a recreational area, etc. – greatly dissimilar from zoning in other countries. At the planning stage, all smaller systems were clearly distributed throughout the city. This approach was initially poorly conceived vis-à-vis the complexity of urban life (Jacobs, 1961). Nevertheless, this practice of urban planning spread to all cities in the Soviet Union, resulting in the uniformity of the urban environment and the lack of uniqueness reflecting localized contexts.

Noteworthy in the application of urban planning was the establishment of spatial units comprising "micro-districts" within a designated smaller system. A typical micro-district included apartment buildings, a school, a kindergarten, and service businesses along major highways. As a rather typical modernist composition, the development of such a large area excluded attention to the human scale, which is particularly evident in the micro-districts of Kazakhstan (Figure 5). Taken together, the use of mass housing in the construction of residential areas meant the layout of typical structures across Kazakhstan, with only minor attention to topography and climatic features. Consequently, all residential areas of Kazakh cities are similar to each other, resulting in monotony and a total lack of local or regional identity or character. There are some exceptions to this condition, however, in buildings located along large streets. The four fragments of residential formations seen in Figure 5 clearly reflect the boundaries of these formations, but with a strict layout using the same types of buildings. Within the figure-ground illustrations of Figure 5, the closed structure of residential areas is apparent, i.e., it can be seen that these housing complexes are not connected with the urban environment as a whole (Gehl, 2011). Therefore, where residential buildings located along major roads and bordering other areas fail to provide residents with the basic and necessary social connections as defined by Gehl, leaving them without even modest opportunities for social wellbeing, the inner territory of micro-districts is worse for the lack of any optional or social activities. This circumstance is well illustrated by the panorama in Figure 6.

Figure 5. Fragments of residential areas in Almaty, Kazakhstan (Source: Authors)

Compelling research related to the problems of Kazakh housing is found in the work of Danish urban designer Jan Gehl. According to Gehl (2011), a healthy urban environment for people depends on three types of activities that he identifies as necessary, optional, and social. In turn, each of the activities is directly related to the physical conditions of the environment. *Necessary* activity, i.e. related to the most basic and fundamental social activity, e.g., work, study, housing, does not provide any special conditions in the environment of a socially redeeming nature. On the other hand, *optional* – or types of activities with some variety – and *social* activities, e.g., casual communication, interaction, acquaintanceship, and recreation require careful attention to the designed environment, to allow optional activity choices. An area within the urban environment must have a set of different functions, in other words, mixed use of the territory, in order for Gehl's three types of activity to occur for the maximum social benefit and what might account for social cohesion and cultural evolution. In the case of social activities, the physical conditions of the urban environment should ensure spontaneous communication between people (dating, communication, recreation, etc.). Therefore, the provision of optional and social activities is convincingly promoted by Gehl as essential to solving the problems of underdeveloped and poorly designed urban areas in general, and Soviet era housing complexes in Kazakhstan in particular. Gehl's research concludes that rather than buildings being the essential components to urban quality of life, the areas between buildings are what are essential this end (Gehl, 2011). Such areas significant to the urban quality of life in Kazakhstan were totally neglected by the Soviet era planners and architects.

The absence of various activities and their requisite physical contexts, identified by Gehl as essential to healthy interaction and quality of life, is common in the residential areas of Kazakhstan. Despite the existing potential, i.e., areas of wide underutilized sidewalks, and spaces between housing and roads, Gehl's concept of "life between buildings" – and the urban design characteristics necessary to that end – is nonexistent. The panorama in Figure 6 shows that the use of common areas is purely situational, and what Gehl would describe as merely "necessary". For example, the first floors of the apartment buildings have no connection with the streets, there are no places on the sidewalks to rest or for pedestrians to spontaneously stop, etc. The example in Figure 6 shows a street within a housing complex in Almaty, used by residents for informal social activity. While not intended for informal gathering, such activity has nevertheless occurred because of the lack of adjacent areas for interaction that Gehl would describe as "optional" and "social".

Figure 6. Street panorama inside the residential areas of Almaty (Source: Yandex Maps)

Considering the adverse features of the urban planning of mass housing, which are the subject of this study, the ubiquity of residential areas that are monotonous, lacking amenities conducive to healthy social interaction, and therefore acceptable conditions of urban quality of life

needs to be recognized with particular emphasis. The typical nature of the houses has affected the entire residential area, and the inherent monotony has led to a lack of any measure of the elemental condition that lends meaning to people's lives implicit in Gehl's work. That condition is simply described as a "sense of place" (Relph, 1976), and the development design approach that involves copying typical tenements completely has excluded any potentialities for individual character that underlies the place. Instead, the tenement developments in Kazakhstan are prime examples of the sparseness and "giantism" in the modernist approach to urban planning (Mumford, 1962; Jacobs and Appleyard, 1987; Newman, 1980). Therefore, Kazakhstan has all the disadvantages of this approach: uniformity of buildings, lack of integration of various activities, lack of public and semi-public spaces, and a lack of provision of compatible and varied land uses that are commonly accepted as effective in urban planning and design.

RESULTS AND DISCUSSION

Multi-apartment housing in Kazakhstan is represented by a wide range of buildings built since 1930. Despite the differences in constructive, architecture and planning solutions, the majority of houses belong to the Soviet era planning and design of mass housing, embodying a number of common characteristics. First of all, the standard design of housing led to the emergence of absolutely identical residential developments, despite various natural, regional, urban, and social conditions. In other words, these apartment buildings are contrary to the principles of the New Urbanism (CNU, 1996), Smart Growth (Duany and Speck, 2009), and the likes of McHarg (1969), Nolen (2005), Lyle (1985; 1994), Steiner (2016), and others in landscape architecture, a profession highly compatible with Gehl's work. A critical problem is the lack of intensive use of territories and the lack of mixed use, which brings a depressive character to residential areas. Since all floors are residential and are poorly connected their surroundings, social activity in the housing settings is limited only to short-term neighborly relationships. The second obvious problem of this housing is the monotony of the layouts and facades. The uniformity of layouts and types of apartments correlates with social segregation, which also negatively affects life in the city (Gehl, 2010; Gehl, 2011; Jacobs and Appleyard, 1987). Therefore, the concentration of people with the same income, social status and family composition unequivocally isolates them from society, and limits opportunities for socializing. Furthermore, a common characteristic of the subject housing is the lack of summer rooms and the chaotic closing of original balconies to compensate for this. Closing the balconies is connected with cultural characteristics, related features of life, and the traditions of the residents (Sarzhanov and Samoilov, 2019). Moreover, the problem is compounded by the building facades, as noted above, as associated with modernist architecture. Therefore, the facades are featureless, foster a monotonous environment, and consequently, have adverse effects on residents' mental health (Alexander, 2002; Ellard, 2015).

This study has identified significant problems with regard to mass housing in Kazakhstan, the solution to which lies either in the renovation of developments, or demolition of buildings. On the one hand, the demolition of buildings makes it possible to renew the urban environment, and to create greater economic and social value compared to mass housing. However, problems associated with demolition cannot be denied, such as the eviction of residents, the destruction of established social connections, managing construction debris, and many more (Woodman, 2015). Therefore, scientifically designed renovation is considered by the authors of this paper as the best solution to the current problems related to a low quality of life. In addition, by demolishing the housing complexes in question, the political environment and development culture would most likely result in a new round of multi-story housing – exceeding seven stories – the negative characteristics of which were described at the beginning of this paper.

Towards urban quality of life

The potential for renovating and repurposing the apartment housing in question is based on the design features of the residential buildings. Based on the structural schemes of buildings and the type of structures, developing recommendations for renovation is a reasonable proposition, taking into account all the problems described in this analysis. At the same time, recommendations should be divided into common – related to the problems of all typical apartment buildings in Kazakhstan, and individual – recommendations for each type of tenement.

Common

- Convert to mixed use of residential development areas by dividing large micro-districts into small complexes and establishing transport, areas for pedestrian gatherings, walkways, and bicycle links.
- Related to the previous point, develop private and semi-private zones of residential buildings, with the active inclusion of first floors into the public and semi-public uses of the city.
- Enlargement of the entrance areas with the provision of natural lighting on the stairs, and other site design enhancements such as the provision of outdoor seating areas, arbor structures over entries, enriched paving, and the planting of trees and shrubs.
- Architectural solutions for the facades, with a search for unique images that take into account the levels of scale and contexts – regional, human cultural, and possibly historical (Alexander, 2002; Salingaros, 2014).
- The addition of open and closed balconies, verandas and loggias in apartments of various types.
- Provision of extensions, additions and the construction of new buildings to give the development a coherent composition within a master planned context.

The first series (Frame-reed, brick)

- To preserve, as much as possible, the architectural and artistic details of the houses of this period.
- Repurposing as hotels, offices and townhouses, depending on the urban context.
- Addition of a third floor in the brick series of tenements.

Large panel (464 series)

- Redeveloping apartments with an increase in the area of the kitchen, bathroom and hallway through the careful removal of interior walls and creation of a "great room" layout.
- Creating different types of apartments on different floors, by combining and redeveloping existing apartments.
- Superstructure of the lightweight attic floor (prefabricated timber modules) (Kuusk and Kalamees, 2016; Jaksch *et al.*, 2016).
- Installation of an elevator.

Large panel (147 series)

- Adding summer rooms and balconies, with a resulting increase in the area of rooms.
- Creating different types of apartments on different floors, by combining and redeveloping existing apartments.
- Redevelopment of the top two floors into two-level apartments.

Frame-panel

- Broadening of the body of buildings, to increase the area of rooms and create summer rooms.
- Expand the entrances with the installation of mail and storage systems.

Frame-brick

- Redevelopment of apartments with the expansion of hallways, and an increase in the kitchen and bathroom areas.
- Extension of insulated and non-insulated balconies, taking into account the urban context and residents' preferences.
- Superstructure of a one- to two-story mansard with the design of two-level apartments.

Monolithic

- Extension of additional volume to the building, i.e. glazed balconies, galleries.
- Architectural completion of the roof, design of a penthouse with access to the roof.
- Changing the functions of the upper floors. From the seventh floor and above, the adaptation of apartments into professional and institutional offices, educational facilities, storage, suitable workshops, etc.

CONCLUSION

Planning and designing housing is a great responsibility within the related professions of architecture, landscape architecture, and urban planning. The wellbeing and quality of human life should be a priority in decision-making that pertains to living environments. The 20th century showed us what experiments in architecture led to without proper attention to the basics of human life. For example, this paper reveals the deep problems regarding Kazakhstan's multi-apartment housing as a product of Soviet modernism. In contrast, the interdisciplinary approach used in this study allows for movement away from direct criticism to possible solutions to the problems described. Addressing the existing social connections and the peculiarities of apartment buildings, the most practical solution is the renovation of these various structures in the cities of Kazakhstan. Despite the many negative characteristics of the houses under study, their potentialities make it possible to radically improve living conditions in each tenement and regenerate the environment in cities such as Almaty and others within the former Soviet Bloc. Importantly, the recommendations given for improving the living environment are purely advisory in nature and each individual case is unique. Moreover, in the realms of planning and design, the various housing typologies in question have significant potential for adaptation and repurposing. Therefore, better alternatives than maintenance of the status quo or demolition and replacement are attainable, as a result of which opportunities for improving the quality of life for the residents and the integration of these complexes into the urban fabric would be more likely occur.

ORCID

Niyaz Sarzhanov https://orcid.org/0000-0002-9301-4932
Thomas Schurch https://orcid.org/0000-0003-1876-0916

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