

Urbanization of the population within the context of urban agglomeration development: a scientific perspective

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Abstract. This paper addresses the issues arising from active and unidirectional migration towards the capital city of Bishkek. The relevance of this work lies in resolving the problems associated with the disproportionate development of internal migration and the capacity of the city. Specifically, this paper examines problematic issues related to the development of residential areas for migrants and the necessity of forming small reference cities around Bishkek. Additionally, we study the housing and social problems that emerge due to the lack of a systematic approach to managing the natural process of urbanization. As a recommendation, we propose building a fundamentally new model of population urbanization in the form of the Bishkek agglomeration to address these impending issues. Therefore, the purpose of this study is to identify problems related to new migration residential buildings and justify the need to build supporting small towns around Bishkek. Finally, we provide recommendations for government and administrative services of the republic in regulating issues related to migration and housing policies.

Keywords: migration, urbanization, capital city, housing, living conditions, population, agglomeration.

1 Introduction

Migration has evolved from an ordinary domestic issue to a global world system. Changes in the scale of migration, goals, methods, and other aspects have necessitated the creation of systemic measures at both state and international levels to address new problems and current situations and consequences. The concept of "attachment to the place of residence" is always mentioned in the meaning of migration, particularly during the awareness and formation of this process as a global phenomenon.

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The main characteristic of migration is a change of residence, even if only temporarily. The presence of a migration process is determined relative to the place of residence, specifically its change.

Regulating a country's regional housing stock can attract migrants or prevent the outflow of the population to regions with favorable conditions, thereby addressing internal migration. For instance, some citizens of the republic may relocate to suburban areas or satellite cities such as Kant, Tokmok, and Kara-Balta when they cannot afford to purchase living space in the capital. The demographic principle of "aging in place" provides a more adequate hypothesis for explaining the relationship between a housing facility and internal migration. The less an individual think about moving to another region due to good housing options, the more they are associated with housing in their current location. Meanwhile, the deterioration of social infrastructure, differentiation of incomes among citizens, and relative decline in the standard of living of the population in specific regions of the country are the impetus for internal migration.

A significant issue in Kyrgyzstan is the prevalence of high levels of internal migration, particularly to the economically developed Chui region, and specifically to its capital city, Bishkek. It is noteworthy that this migration is predominantly observed among rural inhabitants of the southern region, who relocate to urban areas in the northern Chui region. As a result, there is a notable trend towards the urbanization of the population, driven by the growing influx of rural inhabitants to urban centers.

So, for example, the authors N. Mkrtchyan and B. Sarygulov argue that "the migration mobility of the country's population also reflects the distribution of the population by place of birth. In Kyrgyzstan, 81.7% of the population lived in the same region where they were born, 13.9% of the population were born in a region different from their current place of residence (i.e. they were interregional migrants), 4.4% of the population were natives of other countries, those. international migrants in the past" [1].

Contemporary evidence has shown that internal migration is a widespread phenomenon across many nations, where rural inhabitants relocate to urbanized areas with high labor demands. While this is a natural process, it is essential to recognize that excessive internal migration rates can cause disproportionate demographic and economic imbalances between regions with decreasing and increasing populations. This often results in a concentrated urbanization pattern within certain regions of the state. In our context, the Chui region, particularly Bishkek, along with its neighboring cities such as Kant, Kara-Balta, and Tokmok, is undergoing rapid urbanization due to the influx of rural inhabitants. Additionally, there are suburban settlements, which although are categorized as villages, possess adequate infrastructure and public utilities to meet urban requirements. Despite this, these suburban villages, including Lebedinovka, Novo-Pokrovka, Novo-Pavlovka, Kyzyl-Asker, Leninskoye, and Kok-Zhar, exhibit minimal interest in becoming part of the Bishkek city limits.

The significance of this research is undeniably relevant in the context of the active urbanization of the population. The unregulated development of housing complexes and the inadequate tracking of population growth within them can result in poor decision-making regarding the provision of essential infrastructure and communication services. Without precise data on population density and migration patterns within new residential areas, the government will be unable to provide the necessary social amenities to ensure a decent standard of living for the residents.

In this regard, the authors' assertion that "the problems arising from the rapid proliferation of unregulated housing units have left the capital city unable to adjust adequately to the massive influx of internal migrants. Consequently, in the absence of

adequate infrastructure and basic living conditions, these migration housing estates ultimately become the hub of environmental degradation and social inequality, contributing to a high level of public dissatisfaction with the state. Thus, unresolved social issues affecting internal migrants over the years contribute to the exacerbation of social tensions in society" [2] is undeniably accurate.

The objective of this research is to explore the problems and the role of migration housing estates in the urbanization of the population within the housing agglomeration around the city of Bishkek.

2 Materials and Methods

2.1 Review of references

Foreign studies related to migration and the housing issue of migrants include the works of the following authors, C. H. Mulder (2006, 2009) [3], T. De Vroome (2010) [4], F. Van Tubergen (2010) [4] Thomas J. Cooke (2009) [3]. The ideological principles and guidelines for migration processes were taken from the works of leading Russian demographers in the field of migration flows, namely Rybakovsky L.L. [5; 6; 7], Ryazantseva S.V. [7; 8], Mishchuk S.N. [8] and other authors. And from domestic scientists related to the problems of housing and demographic development of the country, namely the work: Asaula A.N. [18], Isaeva K. [9], Borsokbaeva S. [9], Kumskova G.V. [10], Niyazalieva K. N. [10], Ergeshbaeva U. Zh. [11], Kurmanbekova M. [21], Asanakunova B. [21], Dresvyannikova S. [21] and others.

2.2 Methodology of the study

In general, this material has been prepared in the light of the World Plan "Transforming Our World: The 2030 Agenda for Sustainable Development" and achieving the Sustainable Development Goals of the Eurasian Economic Union (Goal 11) [12; 13]. In more detail, the work considered issues reflected in the following goals - this is "Goal 11. Ensuring openness, safety, resilience and environmental sustainability of cities and towns: 11.3 By 2030, expand the scale of inclusive and environmentally sustainable urbanization and opportunities for integrated and sustainable human settlements planning and management in a participatory manner in all countries; 11.a Maintain positive economic, social and environmental links between urban, suburban and rural areas through improved national and regional development planning" [14].

In the process of work, the research methodology was based on general methods of information systematization, demographic analysis and synthesis, methods of classification and selection of statistical information, as well as methods of survey analysis of data on the problems of urbanization of the population.

3 Results

In independent Kyrgyzstan, internal migration, which accounts for approximately 25% of the population, has led to unregulated growth of the urbanized population, particularly in the Chui region. This trend poses a significant threat to the planned and predictable development of supporting cities and the capital, the demographic development of outlying regions, and the agricultural potential of villages and other settlements.

Kazakhstan's migration policy towards its capital, Astana, serves as a model of organized internal migration flow. "The urbanized population has seen a significant increase, with the volume of housing construction and infrastructure provision closely linked to the growth of internal migrants. In general, this centralized migration policy has promoted social stability and economic growth through the proportional distribution of labor and production resources across different regions of the country. It has been an effective program for redirecting citizens from regions with a surplus of southern labor resources, particularly from rural areas, to a rapidly developing urban center in the northern part of the republic" [15, 16, 17].

The process of active urbanization in the Chui region has led to housing problems that are negatively impacting the quality of life for all residents. The strain on existing engineering and social infrastructure is a direct result of the rapid migration population growth, indicating a need to recalculate technical capabilities and financial costs. Moreover, the issue of car traffic and the rapid wear and tear of urban engineering communications has become increasingly pressing, as social facilities struggle to keep up with the influx of people. The current pace of construction for socially significant and residential facilities falls short of meeting the consumer needs of the population.

It should be emphasized that the core problem underlying the urbanization of the Chui region and Bishkek is the territorial limitation on expanding housing construction, largely due to the natural landscape. Bishkek is located in the central part of the Chui basin, at the foot of the Kyrgyz Mountains, which are seismically active. The territory of Bishkek is prone to seismic hazard, mudflows, and floods, while the northern part of the city is susceptible to groundwater flooding due to its lowland location [18].

In light of these issues, there exist a multitude of well-founded viewpoints suggesting that expanding the city's construction zone is not the optimal solution. Instead, many propose constructing higher-rise buildings, including residential complexes. However, this approach only serves to delay the inevitable expansion of the city's territory and does not offer a viable solution to the problem of providing adequate housing to citizens, particularly migrants. The expansion of the city's boundaries necessitates a modernization of the region's management activities, with a delegation of authority to appropriate entities.

In general, the construction of an agglomeration, particularly residential urbanization, incurs significant costs, including transaction costs. Thus, new management systems for business entities engaged in urban construction can aid in the adoption of effective management decisions aimed at reducing transaction costs in construction companies, developed on the basis of cloud technologies..

According to statistics of the Kyrgyz Republic, 74.4% of migrants are aged 25-60. At the same time, 16.5% came from Naryn region, 5.4% from Issyk-Kul region, 5.5% from Talas region, 9.4% from Jalal-Abad region and 11.5% from Osh region. The reasons for migration were such reasons as the presence of unemployment 41.2%, future prospects 23.1%, comfort of life 12.1%, education 11.6% and forced family circumstances account for 9.6% [19].

Per the territorial organization theory proposed by J. Gibbs, A. Lesh, and W. Izard [20], the current capital of Kyrgyzstan belongs to the fourth class of urbanization, which implies an active migration of people towards larger cities while smaller settlements experience a simultaneous demographic decline.

The migratory resettlement of rural populations in Kyrgyzstan has been a pressing issue, and it is believed that the main reason for this is the collapse of collective and state farms. This has resulted in the release of a large number of able-bodied rural people who have migrated to urban areas. However, keeping track of migrants at their destination is

challenging due to the lack of registration and the absence of state registration for their dwellings. As a result, approximately 250-300 thousand of Kyrgyz citizens live in migratory housing estates without accurate information about the number of residents. This has led to underfunding of municipal services, and the maintenance and engineering communications do not correspond to the actual needs of the area. The city's area has grown by more than 2,500 hectares, and there are over 25 settlements of various significance.

The provision of water supply in new buildings is only 37%, electricity supply is 56%, and access roads are at 57%. Furthermore, construction is taking place near a cemetery for animals sick with anthrax, foot-and-mouth disease, and brucellosis, which is unacceptable according to the norms requiring at least 500 meters distance from the nearest object. The insufficient number of secondary schools in new buildings is also a concern, with only 18 housing estates having schools, and one school designed for 380 seats having over 1000 children studying in it in 3 shifts, with three children sitting at each desk. Only eight new buildings have kindergartens, which are overloaded by more than twice their capacity. The primary reasons for migration were unemployment (41.2%), prospects for a better life (23.1%), comfortable life (12.1%), education (11.6%), and family circumstances (9.6%).

It should be noted that the internal migration in Kyrgyzstan is unprecedented in scale, with interregional movements being more predominant than intraregional movements. Migration flows from villages to cities and suburbs are pronounced, and there is a significant difference between regions in terms of their attractiveness for migrants.

However, this trend also results in an undesirable consequence of urbanization - an excessive concentration of migrants, local residents, and other individuals in the capital city. Currently, over 20% of the entire population resides in Bishkek. Independent experts estimate the current population of Bishkek at around 1.4 million, out of a total population exceeding 6.5 million people. Assuming a population growth rate of 2-3%, the city's population is expected to surpass 2.5 million in 25 years [21].

At the current rates of urbanization in Bishkek, the discontinuous/continuous spatial development concept is proposed. This concept refers to the non-continuous nature of the living environment while maintaining continuity in communications and natural surroundings. This form of spatial growth of the city is attractive for several reasons. Firstly, it allows for the preservation and introduction of natural resources between residential formations. Secondly, it increases the speed of movement, depending on the frequency of necessary stops of high-speed public transport. Moreover, the population will be evenly distributed, alternating high-rise buildings with individual housing areas. However, the same authors argue that the predicted demographic growth of the population, migration movements, and traffic restrictions necessitate the use of linear-ring forms with a sectoral structure of the city plan. The combination of the sectoral model, where the functional zones are tied to the main through highways, and the parallel location of zones allows for a comprehensive solution to the complex of urban planning problems in Bishkek. [21].

The diversified structure of the capital is attractive for its significance for future expansion, using various technical and planning solutions and with the possibility of correlation with the surrounding natural and environmental conditions [22].

It is important to note that the combined and diverse structural scheme of the prospective development of an urbanized territory affects the planning of the landscape environment, engineering communications, control and planning of the demographic situation and socio-cultural planning.

Further, in order to find out the full-fledged coefficient of the relationship between migration and the total area per person, we considered the relationship between the

indicator of migration growth or outflow and the coefficient of housing provision. In order to achieve this objective, the relationship between the migration growth or outflow and the coefficient of housing provision was examined. A dynamic diagram depicting the behavior of these two factors was constructed for the period from 2011 to 2021, as shown in Figure 1. The data for this analysis was obtained from the National Statistical Committee of Kyrgyzstan.

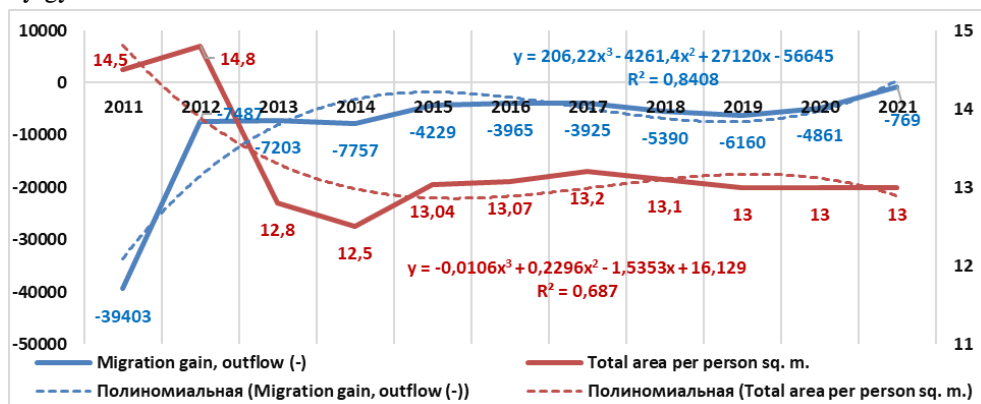


Figure 1. Migration gain or outflow and total area per person for the period from 2011 to 2021 [25]
 Полиномиальная - Polynomial

Source: compiled by the author based on data from the NSC KR for the period from 2011-2021 [25].

The analysis of the diagram reveals that the number of departed citizens exceeds the number of arrivals throughout the entire period under consideration. The maximum migration outflow was recorded in 2011, while the minimum value was observed in 2021. The graph of the total area per person and its polynomial trend line were also plotted. To ascertain the closeness of the relationship between these two factors, a dynamic table was created and analyzed using the Pearson model. The calculated correlation coefficient $R(\text{correl})$ was found to be -0.592 , indicating a moderate level of correlation between the two factors.

Despite the moderate correlation coefficient, it is evident from the graph that the provision of citizens with housing increases sharply at the time of the active growth of the outflow in 2011 and 2012, reaching a peak value of 14.8 m^2 . However, the security indicators began to fall in subsequent years as the number of dropouts decreased. Therefore, it can be concluded that external migration in Kyrgyzstan is associated with the coefficient of provision of living space, and the degree of influence of the outflow is not significant when considered in isolation. However, when combined with factors such as the active growth in the construction of new housing, it can have a significant impact on the amount of housing offered on the market.

4 Discussion

A more fitting hypothesis elucidating the relationship between housing facilities and internal migration suggests that individuals are more attached to their current residence when they have access to good housing and are less likely to consider relocating to other regions. This hypothesis is reflective of the demographic principle of "aging in place." The impetus for internal migration, however, is driven by the deterioration of social

infrastructure, the disparity in income among citizens, and the relative decrease in the standard of living in specific regions of the country.

Bishkek, the capital of Kyrgyzstan, has been facing difficulties in adequately accommodating the influx of migrants, leading to the emergence of migratory housing estates that have become centers of social injustice. The migrants residing in these areas are confronted with a lack of basic infrastructure such as paved roads, schools, hospitals, electricity, and water, which are essential to their well-being. Furthermore, obtaining permits to acquire land plots for residential development in some areas has been problematic, forcing migrants to purchase such land plots with the hope of future legalization. However, even in areas where permits are available, the state has not organized the construction of utility networks, perpetuating the substandard living conditions of migrants.

The situation began to change after the active participation of these citizens in the events of the change of power in 2005 and 2010. These migration residential areas are new settlements mainly organized by migrants. However, local urban residents are not willing to live in areas with limited housing services, even if the cost of such sites is low. For migrants, this is one of the most common methods of relocating to the city, known as "how to get hooked in the city" and continue living there.

According to N.V. Mkrtchyan and B.A. Sarygulov, the internal migration of Kyrgyzstan's population rapidly declined in the 1990s, with the number of annual movements decreasing from 89 to 38 thousand people, or 2.3 times, between 1991 and 1998 [1]. It is worth noting that the active growth of internal migrants was in the late eighties and early nineties, during which land squatting and the formation of spontaneous migration residential areas in Kyrgyzstan began. During this period, residential areas such as "Bravo," "Tsarskoye Selo," "Nice," and others emerged with a relatively high level of quality of housing services.

It is proposed to establish an Administration for the Bishkek agglomeration to systematically manage the influx of migrants and the construction of socially significant infrastructure. This administration will be responsible for regulating and managing migratory housing estates, which are a focal point for incoming migrants. The Bishkek agglomeration aims to become the primary source of housing distribution and a center for economic development in the country. Alternative district administrations will manage migration flows in the satellite cities.

This model of urbanization is expected to result in a 25.0% increase in the population of the capital, as well as key cities and migration residential areas of the agglomeration. Transit traffic through Bishkek will decrease sharply, and the growth rate of private vehicles will decline by 50%. The relocation of industrial zones from the city to nearby international transport and air corridors is also expected to significantly improve the ecological situation in the capital.

The reorientation of a large city and adjacent settlements will lead to the formation of an agglomeration, and the legal status of satellite cities will be determined based on the functional structure of the agglomeration and its changing needs. The self-development of the agglomeration aims not only to increase the scale of housing development but also to improve the quality of life for the entire population.

The development of a transportation network comprising railways and highways is anticipated to revitalize economically depressed residential areas in the future agglomeration. Such logistics routes will foster a unified territorial and market system, enabling increased mobility for the population. The agglomeration's expansion and construction represent an attractive investment opportunity, rendering the entire

urbanization project as a desirable potential for foreign investors. In order to maintain the agglomeration's attractiveness, the construction and launching of production facilities and their associated infrastructure is necessary.

Notably, proportional regional development across the country reduces the rate of oriented migration, which, in turn, diminishes the demographic burden on Bishkek and its suburbs. The creation of an urbanized territory would enable control over the number of new residential buildings, migrants, and social benefits within them.

In light of the above circumstances, it is imperative to expand state policy aimed at resolving issues concerning oriented internal migration and housing development. The implementation of measures by state agencies, aimed at optimizing and regulating migration processes from rural regions of the country to more urbanized areas, must be strengthened.

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