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FEATURES OF URBANIZATION PROCESSES OF KHARKIV AGGLOMERATION

The Kharkiv agglomeration has its own peculiarities of urbanization processes, which is characterized by suburbanization processes, which have various manifestations within its boundaries, and in the eastern part it has atypical features for other territories – the formation of a new settlement.

Keywords: agglomeration, urbanization, suburbanization, urban planning, territory of the city.

Introduction

One of the directions of modern society development is the process of urbanization, which has its own characteristics and differences at various stages. It should be noted that in different countries the processes of urbanization have their own characteristics, which are inherent in a particular socio-political and economic system. They are common for large countries in terms of area, population and regional requirements, which often differ from the indicators of the state as a whole. The specifics of these processes is due to the rapid development of scientific and technological progress, which includes urbanization, as one of the organization areas in large cities. At the same time, it should be noted that along with the positive features the processes of urbanization have negative aspects, such as socio-economic, environmental, land, etc., and the significant rate of migration of rural population to cities leads to the neglect of recently powerful rural settlements, the loss of their functionality, and the destruction of the rural settlement network as a whole.

Modern urbanization processes are characterized by new spatial features, which are reflected in the change in the role and functions of urban settlements, affect the life of people in cities and outside them. At the beginning of the XXI century in Ukraine, the forms of spatial organization of urban settlement are changing: there is an evolutionary transition from point (city, urban-type settlement) to areal urbanization (urban agglomerations, linear forms of urban settlement, metropolis, etc.), which are accompanied by structural changes in the urban environment and significantly affect regional development through the spread of the urban way of life to the countryside (urbanization) and the suburban area (suburbanization), form center-periphery relations and deepen socio-economic disparities. The importance of the formation of self-sufficient regions in Ukraine on the basis of a reasonable spatial organization of the economy

determines the pace, efficiency of urban development and population abundance, optimization of transport and migration flows. The transformation of the functions of cities during the last decades of independence also changed the nature of their influence on regional development.

Analysis of existing research

Scientific achievements of domestic researchers in the field of urbanization include:

- in the context of studying the sustainability of urban agglomerations and the impact of urbanization processes on the regional development [1];
- regarding the methodological foundations of the study of modern urban processes, the methodology of sustainable management development of the city [2];
- in the context of finding ways to ensure the development of cities and agglomerations, in particular research of financial support for urban development are devoted to the works [3];
- regarding the study of the mechanisms of the development of rural areas in the conditions of urbanization V.V. Ambush; E. Stegney, I. V. Prokop and others.

Today, urbanization issues are primarily considered from the standpoint of impact on environmental, social and economic components, which is confirmed by a number of scientific works, as domestic scientists, which considered above, as well as the following foreign researchers. Among foreign authors, it is a matter of study works devoted to urbanization issues [5-8]:

- in the part of the relationship between urbanization and sustainable development;
- in the context of studying the problems of modern urban development, the use of "big data" for needs cities in real time, theories of network urbanism.

From a social point of view, urban spaces, the search for interrelationships between different defining parameters urbanization development in specific cities,

the search for correlations between them, as well as the study of the relationship between the development of the city and the level of trust in the authorities were investigated.

The purpose of the study is to analyze the processes of urbanization in Ukraine and determine the features of suburbanization of the Kharkiv agglomeration.

The main material

Ukraine is not an exception, although it has its own peculiarities of urbanization processes, which take place, for example, in suburban areas of major cities. And if in Soviet times the development of settlements was regulated by plans and programs of long-term development, today there are completely different trends, which are based primarily on employment through the creation of new and development of existing industrial (manufacturing) enterprises. Thus, according to the 1897 census, the largest share of urban population was recorded in Kherson (28.9 %), Tavriya (20.0 %), Kharkiv (14.7 %) and Kyiv (12.9 %) provinces. The territory of Kharkiv province included the lands of four modern regions of Kharkiv, Sumy, most of Luhansk and a small part of Donetsk region (Fig. 1).

It should be noted that even at this time the territory of the city of Kharkiv is compact, well developed, with developed infrastructure for that time (Fig. 1, Fig. 2a). The city is a scientific center and has a strong production site. There were 1,699 educational institutions and 300 free reading libraries in the city in 1901. There were also 340 factories and plants, which employed 38,372 people. The province ranked the first place by the number of fairs in the Russian Empire (more than 400) [10].

Urbanization reached a more rapid development in the first half of the twentieth century. Thus, 30 years later (1926 census) in the Ukrainian Soviet Socialist Republic (USSR) the number of urban residents increased to 5,373.5 thousand people, which was 18.5 % of the total population.



Fig. 1. Map of Kharkiv province [9]

It should be noted that the administrative reform took place at this time and the territory of Kharkiv province fell into two subdistricts: Left Bank (Kharkiv and Sumy regions) with urban population of 1,117.2 thousand people (15.8 %) and Mining (Lugansk and Donetsk regions) with urban the population of 851.6 thousand people (41.8 %). During the administrative reform in June 1925, the city of Kharkiv became the capital of the Ukrainian Soviet Socialist Republic. The territory of the Kharkiv district in 1926 is shown in Figure 2b.

According to the 1939 census, the share of urban population increased to 36.2%, and more than 70 % in the mining regions (Donetsk and Luhansk regions). Concerning the city of Kharkiv, there is a significant expansion of its territory on all sides, especially on the eastern and southern sides (Fig. 3). This is due to the industrialization of the city, the construction of large industrial enterprises (factories) and the creation of a comfortable residential area.



(a) Kharkiv city plan of 1896



(b) Map of the Kharkiv district in 1926

Fig. 2. The territory of the city of Kharkiv and Kharkiv district [9]



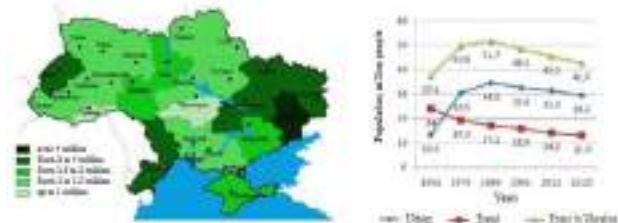
(a) 1938



(b) 1940

Fig. 3. Plans of Kharkiv in 1938 and 1940 [9]

According to 1965 data, the urban population of Ukraine exceeded the rural population and amounted to 50.55 %. High rates of urbanization were observed in the 50s and 60s in Ukraine, which happened due to the processes of industrialization. The urban population grew rapidly, especially during the 1960s, by 0.5 million annually. Population indicators of Ukraine in 1951-2020 are presented in Figure 4 [11], [12].



(a) The population of the regions of Ukraine in 2020 (b) Dynamics of the population of Ukraine
Fig. 4. Population indicators of Ukraine in 1951-2020

As for the city of Kharkiv, there is an initial increase in population and increase in its territory, especially in the eastern part, the formation of industrial (manufacturing) and residential areas along Moscow Avenue, the expansion of transport infrastructure (Fig. 5).



Fig. 5. Scheme of transport routes of the city of Kharkiv in 1968 [9]

According to the census of 1979, the tendencies of urbanization as a whole persisted and the number of urban population of Ukraine has already exceeded 60%. These processes were unchanged in subsequent years. This way, the urban population was 67 % in 1979-1989 according to the background of industrial development and on January 1, 1992 – 68 % of the total population of Ukraine.

High rates of industrial, public and residential construction took place almost until the end of the 1980s. There is an increase in the number and population of settlements located in suburban areas of large cities, so called the formation process of urban agglomerations or suburbanization.

Despite the processes of reforming various sectors of the economy, urban processes occur during the years of independence of Ukraine. According to the 2001 census of Ukraine, urbanization amounted to 67.2 %, and in 2012 – 68.9 %. This is especially true for Kyiv, Donetsk, Luhansk, Dnipropetrovsk (Dnipro), Kharkiv and Zaporizhia regions (more than 70 %) [11], [12].

It should be noted that over the past three decades, urban processes in Ukraine have a number of other features than in the previous century. Thus, the territory of the city of Kharkiv at the beginning of 2003 was 30,604 hectares, including 17,042 hectares of housing (Fig. 6 a).

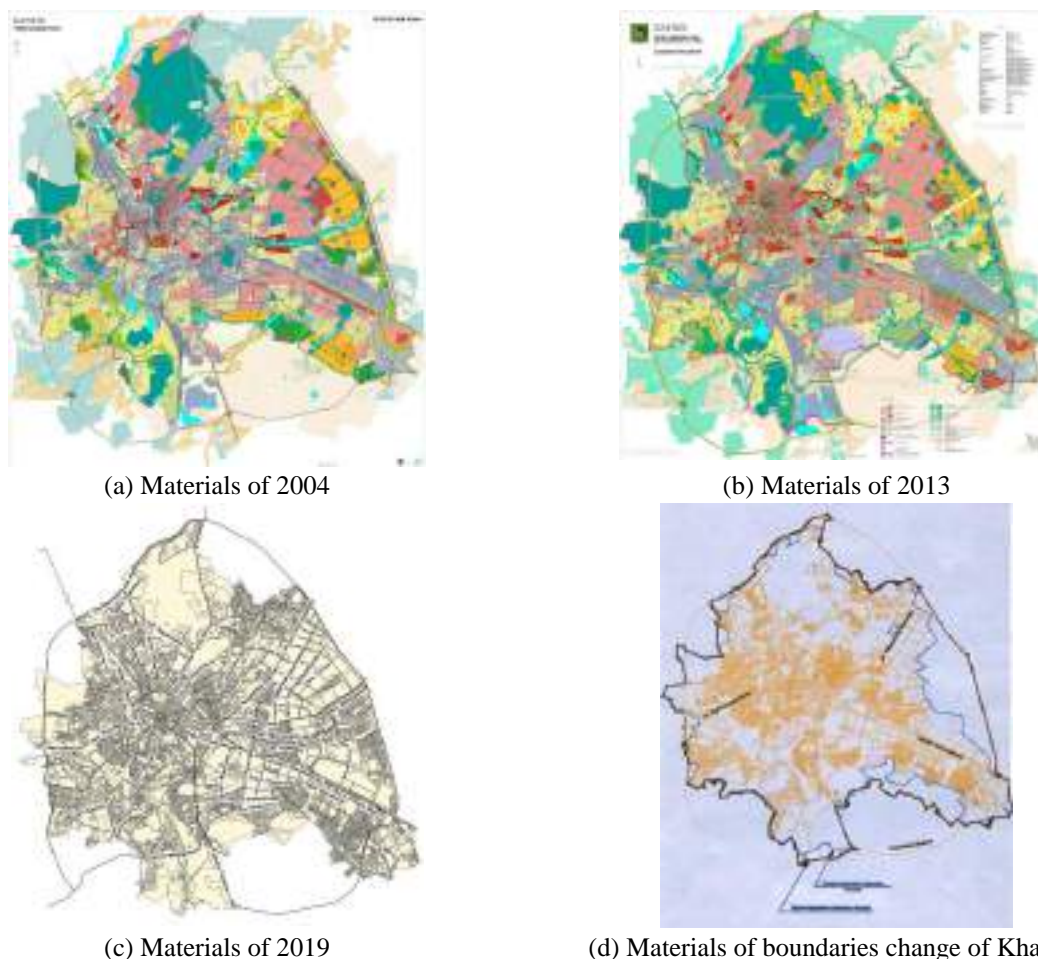


Fig. 6. Plans of the city of Kharkiv and changes to it [13]-[17]

Data from the analysis of the dynamics of population change in the city of Kharkiv shows that the maximum figures were reached in 1991 (1,622.8 thousand people) and further systematic decrease occurred by an average of 12.6 thousand people per year for 11 years, and at the beginning of 2002 the population number was 1,484.3 thousand people [11]. The reasons for the reduction of the city's population include:

1. reducing the birth rate with a high mortality rate;
2. the predominance of the outflow of population, including abroad, over inflow of population.

In Soviet times, all these processes were accompanied not only by an increase in the urban population, but also by a significant expansion of the settlements themselves, usually due to adjacent land and agricultural purposes, which was possible because there was a single state land ownership and management system.

During the general plan of the city of Kharkiv development (2002-2003), in order to improve the demographic situation and promote urban development of the city, the main directions were: ensuring comprehensive, planned, economically feasible development of urban infrastructure and creating

conditions that improve level of life, the city and its suburban area.

As of the beginning of 2019, the area of the city increased and amounted to 35,002.26 hectares, the population was 1,446.5 thousand people [14]. However, despite of some positive changes in the demographic situation (there was an increase in population, due to increased fertility), the processes of population aging and external labour migration continues.

One of the natural patterns of spatial and regional development is the process of urban agglomerations formation, the manifestations of which are observed in the twentieth century around the world [20-22].

The global development of agglomeration processes is associated with the intensification of interactions between settlements located near the cities-centers, as well as in the movement of the population to the suburban areas of large cities [23-25].

In the second half of the XX century there was an intensive development of the suburban area in the largest urban agglomerations of developed countries (USA, Canada, Japan and most Western European countries, mainly due to relocation of urban residents (usually wealthy) and transfer of some city functions to the suburbs. The process of suburbanization began with the largest and most developed urban agglomerations,

gradually spreading to other areas. This was facilitated by the significant motorization of the population, which increased the freedom of choice for place of living, employment and service. At the same time, the marginalized strata of the population continued to migrate to the central cities. This has led to a concentration of the most affluent population in the suburbs and the poorest groups such as immigrants, national minorities, the unemployed people and marginalized youth in the central cities. The biggest social differentiation between the city and the suburbs has developed in the United States, less - in Canada and Western European countries, insignificant - in Japan. A characteristic feature of these processes was the formation of a young age structure of the population in the central cities, which led to natural population growth.

A clear example of suburbanization is the United States. In the early 1980s, about 70 million Americans owned single-family homes, accounting for $\approx 63\%$ of the country's urban housing stock (51 % in urban centres and 75 % in the suburbs). This led to an increase in the territory of settlements, while the rate of increase was four times faster than the growth of population. A characteristic feature of the formation of the suburban zone at the initial stage was exclusively residential formations with a view to pendulum migration. But over time, there was a shift from urban centres to the suburban area of industrial enterprises, offices, research, design organizations, technology parks, university complexes and more. So, almost a third of them today are outside the city centres. According to G. M. Lappo – the suburbs have become more or less independent "suburban cities".

Since the 1960s, the processes of suburbanization have spread to European cities, which previously developed as compact areas with a high population density. Suburbanization is more spread in British cities, compared to the cities of continental Europe.

Western processes of suburbanization are characterized by a special form – the construction of suburban areas of capital family houses and the relocation of a large part of the urban population to domicile.

After the ending of the socialist policy of urban planning in 1990-1991, they were joined by the cities of Central and Eastern Europe.

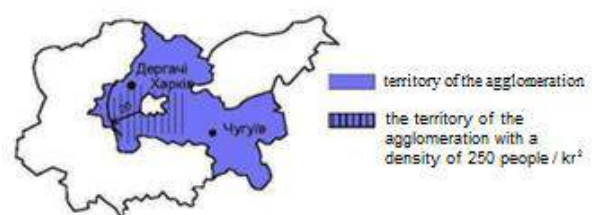
The process of suburbanization began in the second half of the twentieth century, and has gained momentum in the last two decades in Ukraine. This is due to the development of road transport, transport communications, changes in living conditions, the location of new industrial facilities near the ring and main roads, as well as the construction of large shopping centres on the outskirts of cities. Intensive development of the suburban area is due to the

relocation of city residents to the suburban area. At the present stage, the peculiarity of urban development and the formation of suburban areas around them is expanding the boundaries of settlements, with the inclusion of not only agricultural land, horticultural societies, summer cottages, neighbourhoods of individual homesteads, large industrial enterprises, and sometimes the adjacent rural settlements, including changes in the administrative-territorial structure.

The formation of a new urban housing stock in the second half of the XX century was mainly due to the construction of multi-storey residential buildings by industrial enterprises, institutions and organizations. The developed cooperative construction was developed in the 70's – 80's of XX century, which partially eased the situation with the provision of individual housing for urban residents, but its share was insignificant in the city housing stock. After the proclamation of Ukraine's independence, in order to provide housing for the inhabitants of cities, villages and settlements, land plots for the construction and maintenance of residential buildings, outbuildings and structures (individual homestead buildings) were provided by living area at the expense of agricultural lands adjacent to settlements, which do not have the appropriate engineering and transport infrastructure. These areas are especially attractive in suburban areas, around large (regional and district centres) and rural settlements, which are located 20 km from the regional centres. This has led to a significant increase in the area of settlements in the future, sometimes increase in several times, with a shortage of local budgets to create appropriate infrastructure in their territory.

The Kharkiv agglomeration is the second largest agglomeration of Ukraine, which is formed around the city of Kharkiv. According to "Demographia World Urban Areas", the Kharkiv agglomeration ranked 333rd in the world with a population of 1,590 million people and a population density of 4.000 people/km² in 2018 and in 2020 353rd place in the world with a population of 1.486 million population and population density of 3.775 persons/km².

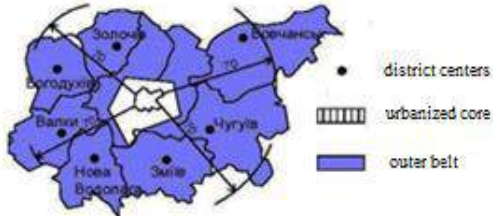
The formation and development of the Kharkiv agglomeration is directly connected with the historical features of industrial production formation and the settlement of the population at the end of the XIX century (Fig. 7).



(a) Agglomeration A.G. Vyshnevsky (1959)



(b) Master plan with the suburban area. Kharkiv branch of Giprograd (1967)



(c) PRP of the group of administrative districts in the suburban zone of influence of Kharkiv. Kharkivproject (1986)



(d) The scheme of town-planning substantiation of a zone of influence. Dipromisto (2004)

Fig. 7. The main stages of influence zone formation of Kharkiv [16]

Until now, the common vital functions connected Kharkiv with a large area of settlement. More than 18 % of Kharkiv's working population lived outside the city. Thus, the main urban concept of the 1960s became a comprehensive solution for the formation and development of the city and its suburban area. The main stages of the influence zone formation of the city of Kharkiv are presented in Figure 7. However, today the urban processes of Kharkiv have again changed their direction (Fig. 8) [16].



Fig. 8. Urban processes of the city of Kharkiv in 2020 [16]

The creation of the village of Communist in the Kharkiv district of Kharkiv region can be cited as a typical example of suburbanization. In 1928, the land of the Communist collective farm on east of the city of Kharkiv was allocated, on the territory of which a small settlement of the same name was formed in 1944, which was also the production structure of the Kharkiv Agrarian Institute (KhNAU), which is still the basic educational institution for the training of agricultural specialists (Fig. 9a).



(a) Territory of the Communist settlement 1959



(b) Territory of the Dokuchaevske village in 2021
 ——— the settlement boundary in 1959
 ——— the settlement boundary in 2021

Fig. 9. Territory of the Dokuchaevske village (Communist)

The village received a significant modern development in terms of construction and territory at that time with the construction of a new complex of KhNAU in 1970 (Fig. 10).

That is, in 20 years, in addition to the existing building, the buildings of KhNAU, one four-storey and five nine-storey hostels for students, several hostels for employees, five nine-storey and 15 five-storey residential buildings, two two-storey kindergartens, a school, two shopping malls with public utilities and developed modern infrastructure were built at that time (Fig. 11a, b, c). During the period of independence of Ukraine, small trade facilities and quarters of private individual housing appeared and the boundaries of the

settlement expanded (Fig. 9b). At the same time (according to the 2001 census of Ukraine), 7,241 people lived in the village, this means 1,067 people less, partly due to migration to the city of Kharkiv. In 2016, the village of Communist was renamed as the village of Dokuchaevske. Today, the specifics of the development and functioning of the settlement keeps a direct

connection with the Kharkiv National Agrarian University named after V. V. Dokuchaev (KhNAU named after V. V. Dokuchaev), the population of the village has increased again and is equal to 7,251 people, which requires a comprehensive solution to many issues, including those related to land use (Fig. 11d).

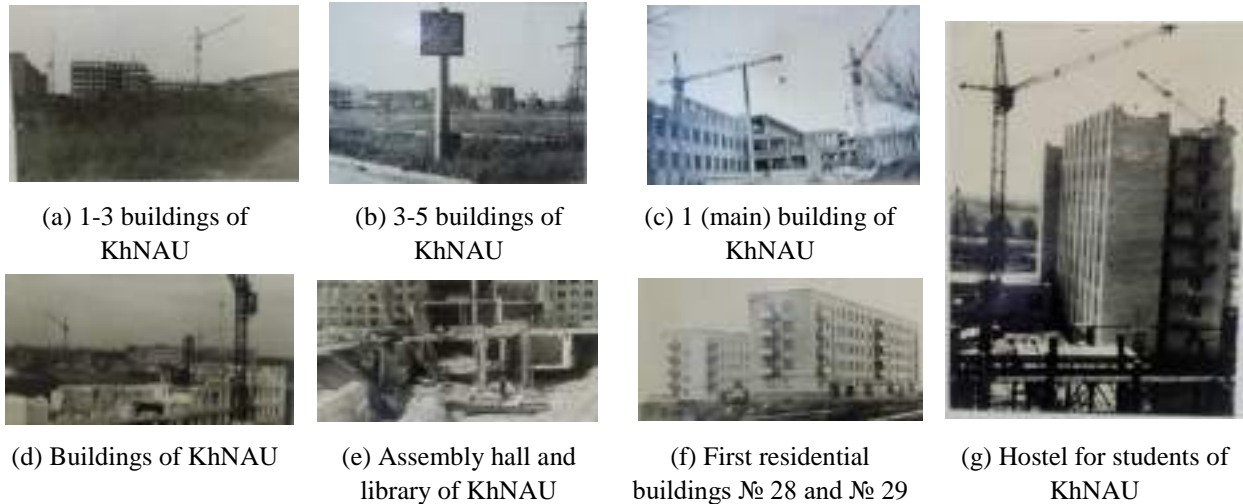


Fig. 10 – First 5 years of KhNAU construction



(d) 2020-2021

Fig. 11. Territory of KhNAU named after V. V. Dokuchaev

In modern conditions of three equal forms of land ownership functioning (state, municipal and private), increase in the territories of settlements needs the corresponding substantiation and additional financial resources. In addition, the change of land ownership (especially from private to state or municipal) is a rather complex procedure, which may be accompanied by large time consumption (obtaining consents, permits, etc., including compulsory (judicial) procedures).

Conclusions

Therefore, according to the results of the study we can draw the following conclusions:

1. Urbanization processes in Ukraine have common features and stages with the urbanization processes in the world.

2. The development of the Kharkiv agglomeration in the XX – early XIX century has different trends because of political, socio-economic and administrative-territorial structure.

3 The processes of suburbanization are accompanied by problems of undeveloped infrastructure of settlements (engineering and transport, social and household, etc.) at the initial stage.

4. The presence of planned project development of territories allows to solve a number of household problems in a short time period with optimal economic indicators to create comfortable living conditions and development of settlements.

However, the existence of different forms of land ownership complicates the implementation of design solutions for optimal land use and resettlement. Therefore, when planning the territory and efficient use of suburban lands in the context of urbanization of large cities the existing land fund and its structure: by form of ownership, purpose, functional use and opportunities for change should be taken into the account. At the stage of collecting initial data, the reliable information should be obtained, be thoroughly analysed and basing on them the substantiated offers for planning and use of all lands should be provided with appropriate reflection in urban planning and land management documentation.

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ОСОБЛИВОСТІ УРБАНІЗАЦІЙНИХ ПРОЦЕСІВ ХАРКІВСЬКОЇ АГЛОМЕРАЦІЇ

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Процеси урбанізації мають загальні особливості в Україні та у світі. Процеси урбанізації в різних країнах характеризуються своїми особливостями, які притаманні певному соціально-політичному та економічному устрою. Вони характерні для великих за площею та чисельністю населення країн, регіональних вимог, які часто відрізняються від показників держави в цілому. Специфіка зазначених процесів обумовлена стрімким розвитком науково-технічного прогресу, що передбачає в тому числі і урбанізацію, яка є однією із напрямків устрою великих міст. У той же час, слід зауважити, що процеси урбанізації на ряду з позитивними ознаками мають і негативні сторони, такі як: соціально-економічні, екологічні, земельні та ін., а значні темпи міграції сільського населення до міст, призводять до занедбаності ще нещодавно потужних сільських населених пунктів, втрату їх функціональності, і руйнування сільської поселенської мережі в цілому. Агломерація Харків, яка займає друге місце в Україні та 353 у світі, має свої особливості процесів урбанізації. Її формування відбулося як частини різних країн, різної політичної та адміністративно-територіальної системи. Статус міста Харків мав важливий вплив на формування та розвиток агломерації в різні роки: як перша столиця України, провідна торгівля, науковий, промисловий центр та як розвинений сільськогосподарський регіон. Мета дослідження – проаналізувати процеси урбанізації в Україні та визначити особливості приміської агломерації Харків. Дослідження проводили за допомогою методів діалектичного пізнання процесів та явищ, аналізу та синтезу, порівняння, сходження від абстрактного до конкретного, графічного. Агломерація Харкова характеризується процесами передмістя, які мають різні прояви в межах її меж, і у східній частині він має нетипові особливості для інших територій – утворення нового поселення (Докучаєвське (Комуніст)), спочатку як виробнича одиниця провідної сільськогосподарської школи (Харківський аграрний інститут), а згодом і незалежне, повноцінне сучасне село з багатопверховими будівлями, завдяки переселенню навчальної та виробничої бази Інституту за межі міста. Наявність різних форм власності на землю ускладнює реалізацію проектних рішень щодо оптимального використання територій та розселення. Тому під час планування території та ефективного використання земель приміської зони у контексті урбанізаційних процесів великих міст слід враховувати наявний земельний фонд, його структуру: за формами власності, цільовим призначенням, функціональним використанням і можливостями внесення відповідних змін. Саме на етапі збору вихідних даних повинні бути отримані достовірні відомості, які мусять бути всебічно проаналізовані, та надані на їх основі обґрунтовані пропозиції щодо планування та використання усіх земель, з відповідним відображенням у містобудівній та землепорядній документаціях.

Ключові слова: агломерація, урбанізація, приміська зона, містобудування, територія міста.