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USE OF MODERN GIS METHODS IN GEOVISUALIZATION OF URBANIZATION PROCESSES AND ENVIRONMENTAL CONDITIONS

Abstract. Urbanization is the process of increasing the role of cities in the development of society and the economy and forming urban infrastructure, which serves to make positive changes in the socio-economic, professional and demographic structure of the population, as well as to raise its lifestyle and culture to a new qualitative level.

This article analyzes the urbanization processes in the Tashkent region of the Republic of Uzbekistan. The study also notes that cities in the Tashkent region and districts within the city of Tashkent are also an integral part of the research work. According to the analysis presented in the infographic of the area of cities in the Tashkent region, it is proven that large cities within the region do not differ significantly from the area of districts in the capital.

This article determines that as of 2024, the permanent population of our Republic will be 36.8 million people, of which almost a quarter will fall on the Tashkent region and the city of Tashkent. Compared to 2010, the urban

population increased by 118.2%, while the rural population increased by 117.8%.

Keywords: Urbanization; Environment; city; town; population; Uzbekistan; Tashkent.

INTRODUCTION

Tashkent region is one of the regions in the Republic of Uzbekistan where urbanization processes are developing and rapidly changing. Therefore, the number and type of settlements in the region were analyzed. According to the study, as of January 1, 2024, Tashkent region had 15 districts, 16 cities (7 of which are independent of the district), 89 towns and 828 rural settlements. In the regulation of urban development sectors and population, a territory (city, town, village, aul) is defined as a territory with its own legal status, its own name, and administrative-territorial borders, according to the provisions of the State Urban Planning Code of Uzbekistan.

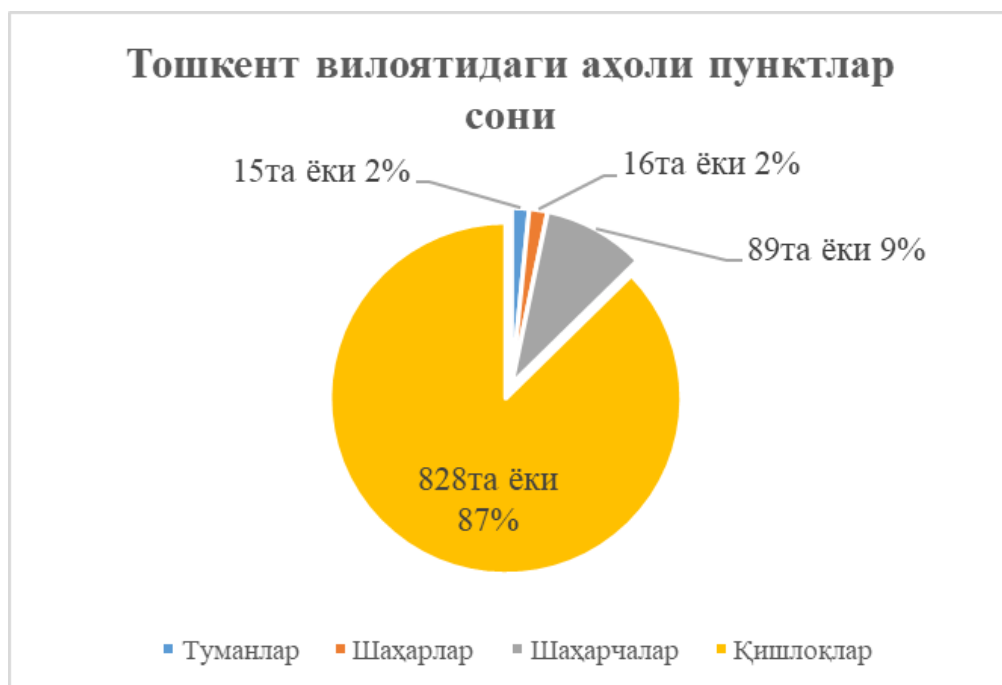


FIGURE 1. Distribution of settlements by type

The majority of settlements in Tashkent region consist of small villages and hamlets, while cities and towns account for 13% of all settlements in the region. It can be observed that urban settlements in Tashkent region and Tashkent city are few in number and large in area [2]. Based on this geographical and statistical data, the research object was further selected.

MATERIALS AND METHODS

The total area of Tashkent region is 15.15 thousand square kilometers. There are 7 cities in Tashkent region with an administrative structure in the form of a separate city, which are Angren, Bekabad, Nurafshon, Almalyk, Oxangaron, Chirchik and Yangiyul. These 7 cities and the city of Tashkent were determined as objects of scientific research. The largest city in Tashkent region is Angren, its area is 16.1 thousand hectares. The smallest city is Yangiyul and its area is 1.5 thousand hectares [1].

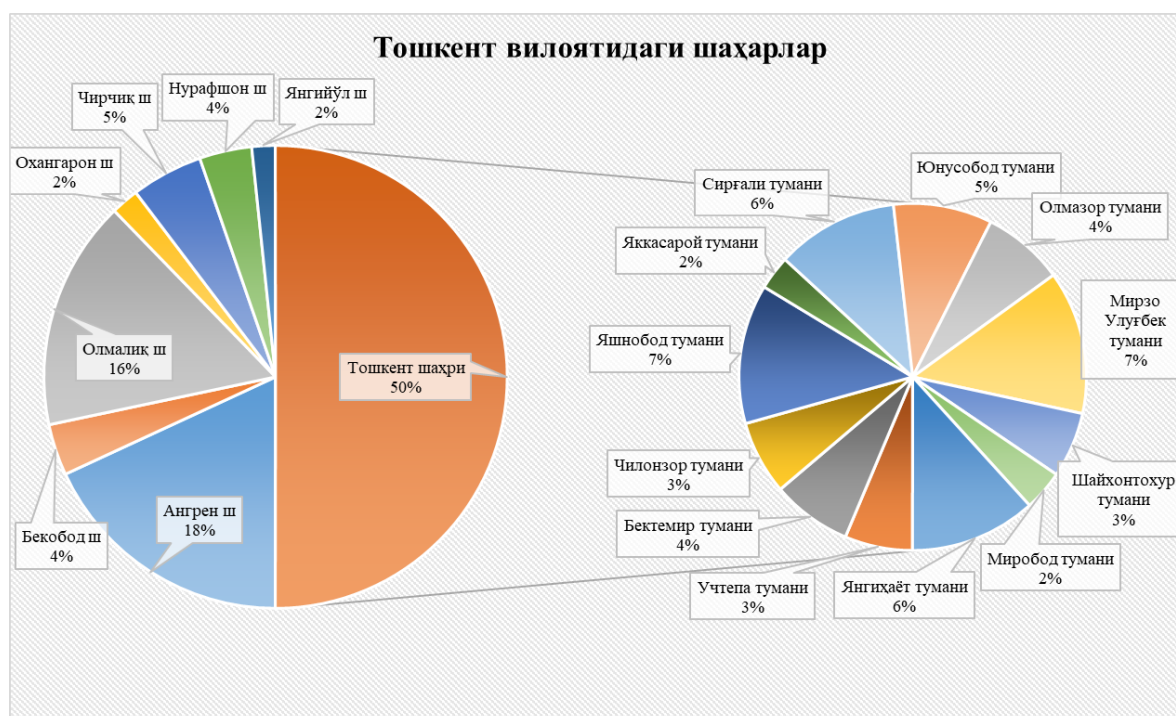


FIGURE 2. Infographic of the area of cities in the Tashkent region

Cities in the Tashkent region and districts within the city of Tashkent are also an integral part of the research work. According to the analysis presented in the infographic of the area of cities in the Tashkent region, large cities within the region do not differ significantly from the area of districts in the capital.

Tashkent city makes up part of the area of settlements selected as the object of research. This is one of the main reasons for selecting the areas of Tashkent region and Tashkent city as the object of research. In addition, the need to conduct research in recent years due to the construction, expansion of the territory and increase in population indicators in Tashkent city is also part of the research work. According to general classifications, the settlements selected throughout the Tashkent region and Tashkent city are schematically represented in the figure below in a simple way [2].

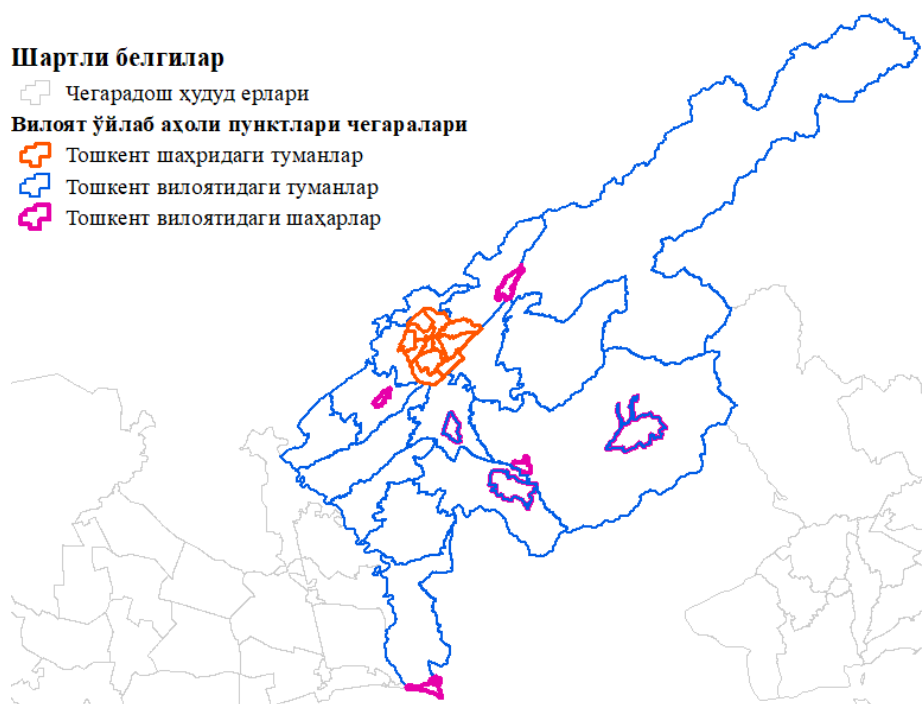


FIGURE. 3. Schematic map of the location of cities across the Region

In addition to the quantitative and territorial indicators of settlements, their social and economic indicators are also of great importance. In recent years, the

growth of the urban population has had a significant impact on the development of industrial sectors. The city, by creating a large number of social amenities for the population, increases the demand for urbanization of the rural population [3].

In the list of territorial units with the largest urban population in Uzbekistan, the city of Tashkent is in first place (more than 3 million), the Fergana region is in second place (more than 2.3 million), the Namangan region is in third place (about 2 million), the Andijan region is in fourth place (about 1.8 million), the Samarkand region is in fifth place (1.546 million) and the Tashkent region is in sixth place (1.53 million) [4].

There is a set of separate statistical indicators of the population of the city of Tashkent and the Tashkent region, which are the objects of the study, and the population in cities and villages, and based on these statistical data, a number of analyses of urbanization indicators have been conducted. The presented diagram shows the percentage of the population of the object of the study in the Republic.



FIGURE 4. The indicator of the distribution of the population of the republic in the cross-section of the regions

The permanent population of our republic as of 2024 is 36.8 million people, almost a quarter of which falls on the Tashkent region and the city of Tashkent. This indicator shows that the population is densely distributed throughout the territory and the urbanization process is intensive. Compared to 2010, the urban population increased by 118.2 percent, while the rural population increased by 117.8 percent [5,6].



FIGURE 5. Changes in the population of Tashkent region between 2010 and 2024

The population of Tashkent city and region has increased dramatically over the past 3 years. Statistical data shows that the population of Tashkent city has increased by 136.1 percent or 1.36 times over the past 14 years.

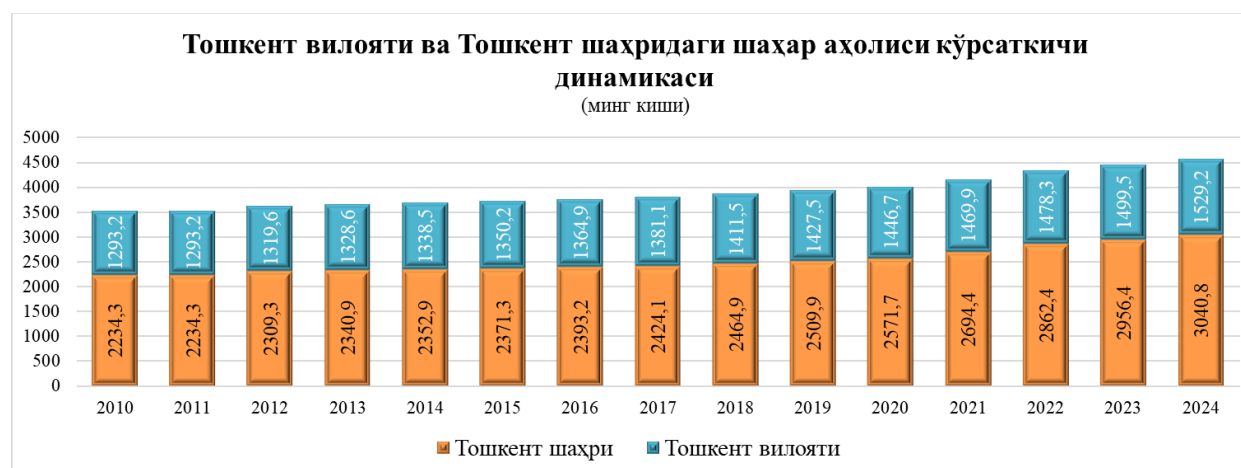


FIGURE 6. Urban population statistics in Tashkent city and region

The population growth rate in our republic between 2014 and 2024 was 131.4 percent. The dynamic indicators in Tashkent region are very low compared to the general dynamics (13.2 percent). The indicators in Tashkent city are higher compared to the average growth (4.7 percent). However, the large population in Tashkent city creates a dynamic balance between Tashkent city and the region.

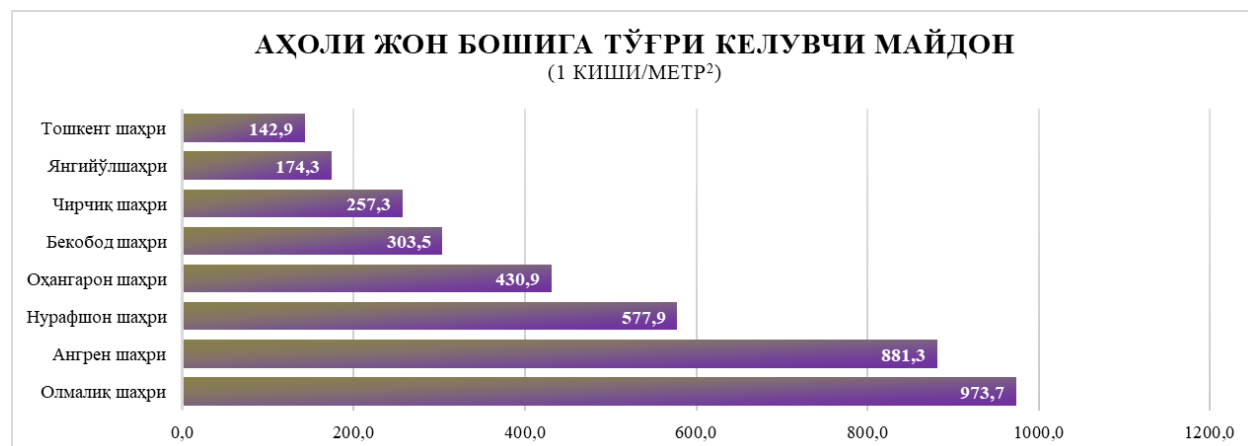


FIGURE 7. Population density infographic at the research site

According to the data presented in the diagram above, the population density in Tashkent city and the cities of the region is different. The most sparsely populated city is Almalyk, while the most densely populated city is Tashkent city. If there are 7 people per 1000 square meters in Tashkent city, then the same indicator is 1 person in Almalyk. The situation reflects the degree to which cities are prone to urbanization. Another key indicator of the urbanization process is the activity of industrial enterprises. Since industrial enterprises are the main source of income for the population, they strive to keep the distances between all workplaces and residential areas short. This situation encourages people to find housing in areas not far from enterprises. Thus, changes occur in the territorial, socio-economic, and production directions of cities.

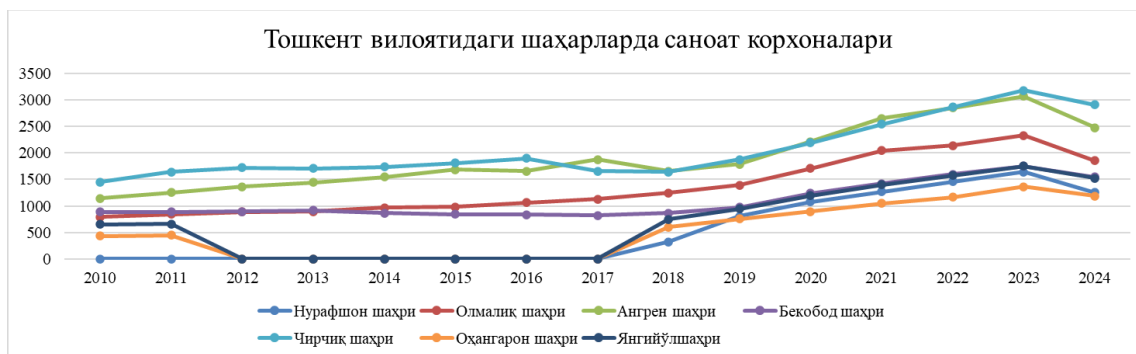


FIGURE 8. Number of industrial enterprises in Tashkent region

If the number of industrial enterprises is considered a determining factor in part of urbanization, then another statistic confirming this is the employment rate of the population. Tashkent city and region occupy the leading positions in the Republic in terms of employment rate. In first place, Tashkent city provided employment for 82.3% of its population [7].



FIGURE 9. Employment rates of the population (in %)

Tashkent city and Tashkent region occupy leading positions in terms of population employment. Employment indicators indicate that the industrial, production and service sectors of the region are well developed. Individual entrepreneurship and self-employment are also developed in Tashkent city. The fact that society is engaged in entrepreneurial activities of various scales in order to

rational use of social conditions and generate income represents much higher indicators than in other regions.

CONCLUSION

The urbanization process involves the expansion of urban areas, the inclusion of suburban areas into the city, and the unification of several settlements into a single city. According to the analysis of this study, changes in urbanization in the Republic of Uzbekistan in recent years are mainly evident in Tashkent region and Tashkent city. The study also shows that the increase in urbanization processes also affects industrial enterprises. The main reason for this is directly related to the level of population employment and is the growth in the industrial, production and service sectors. The study shows, based on statistical data, that the population has been increasing sharply over the past 3 years.

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