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GEOGRAPHICAL CHARACTERISTICS OF THE POPULATION DISTRIBUTION IN NAMANGAN REGION BY ALTITUDE REGIONS

Abstract: *This article examines the characteristics of population distribution and density in Namangan region across elevation zones. The population distribution in relation to the terrain was determined using Geographic Information System software by analyzing the altitude of settlements above sea level. Settlements were classified into small groups based on their elevation, and on this basis, the districts of the region were grouped.*

Keywords: *Namangan region, population, population density, population location, altitude regions, settlements, natural factors, socio-economic factors.*

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ГЕОГРАФИЧЕСКИЕ ОСОБЕННОСТИ РАЗМЕЩЕНИЯ НАСЕЛЕНИЯ НАМАНГАНСКОЙ ОБЛАСТИ ПО ВЫСОТНЫМ ПОЯСАМ

Аннотация: *В данной статье изучены особенности размещения и плотности населения Наманганской области в зависимости от высотных поясов. Размещение населения с учетом рельефа определено на основе программ ГИС, путем анализа высоты населенных пунктов над уровнем*

моря. Населенные пункты классифицированы на небольшие группы по высоте, на основе чего районы области были разделены на группы.

Ключевые слова: *Наманганская область, населения, плотность населения, размещение населения, высотные пояса, населенные пункты, природные факторы, социально-экономические факторы.*

Introduction: As we know, the location of the population depends on a number of natural and economic and social factors, among which the main role is played by natural conditions. The study of the location of the population by altitudinal regions is of great importance for the disciplines of geography, geodemography, climatology and socio-economics. This is because this issue helps to understand the way of life of the population, the use of natural resources, their impact on natural landscapes, their participation in migration processes and their adaptation to climate change.

The world's largest population lives at altitudes of up to 500 meters above sea level, i.e., in the plains. But they occupy only 28% of the land area. The exception is Mexico, Peru, Ethiopia, Afghanistan, and other countries located in similar mountainous regions, where the majority of the population lives in mountainous areas at an altitude of 1000 meters above sea level. For example, in Tibet, people live at altitudes of 5000 meters and above.

Methods: Taking into account the above, the aim of this article was to study the distribution of the population of Namangan region, whose territory consists of plains, foothills and mountainous regions, by altitudinal regions. To achieve this goal, the following tasks were set:

1) To divide the districts of Namangan region into groups according to population density;

2) To study the distribution of the population of Namangan region by altitudinal regions;

3) To divide the territory of Namangan region into subgroups according to altitudinal regions and determine the number of people living in them.

Results: Namangan region is located in the east of the Republic, in the northwestern part of the Fergana Valley, on the slopes of the Tianshan Mountain Range networks-the Qurama and Chatqol mountains. It borders Jalalabad region of Kyrgyz Republic to the North and Northeast, Andijan to the Southeast, Fergana to the south, Tashkent region and Sughd region of Tajikistan to the North and northwest.

Positive changes in the dynamics of the population, of course, are reflected in its location. One of the main indicators of population location is population density. The famous scientist Kovalev S.A. emphasizes that "the most general, detailed idea of the location of rural settlements is given by the average density of population points." Population density in the territory of Namangan region has been increasing year by year, mainly due to natural increase. For example, the population density was 303.6 people in 2010, 319.8 people in 2011, 325.3 people in 2012, 330.3 people in 2012, and by 2024 it will be 412.1 people, respectively. As a result of favorable natural conditions and reforms in the socio-economic sphere, the population, as we noted above, is increasing due to natural increase, and accordingly, the population density is also increasing. Since the districts and cities of Namangan region differ from each other in terms of area and natural conditions, there are also differences in population density.

Among the districts, Namangan district stands out with the highest population density with 948.4 people, Turakurgan with 899.0 people, and Naryn district with 848.7 people, while Pop district ranks last with 81 people per km^2 (Table 1).

Table-1

Population density grouping of districts of Namangan region (2024)

Population density in group distribution	Number of districts	Districts belonging to groups	Average population density (people per km^2)	Population, in the account of a thousand people	In percentage accounting for the total population
In the region	**11 pieces**		**412,1**	**3066,1**	**100**
80-100 people	1 pieces	Pop	81,0	235,7	7,7%
100-300 people	1 pieces	Mingbulak	184,8	136,9	4,5%
300-500 people	3 pieces	Chust	304,6	285,6	9,4 %
		Kasansay	414,4	227,9	7,5%
		Yangikurgan	451,6	237,1	7,8%
500-700 people	2 pieces	Chartak	569,5	214,9	7,1%
		Uchkurgan	618,5	185,4	6,1 %
700-900 people	4 pieces	Uychi	763,4	232,3	7,8%
		Naryn	848,7	175,8	5,8%
		Turakurgan	899,0	245,2	8,0%
		Namangan d.	948,4	192,7	6,3%

Note: The table was compiled by the authors based on data from the Namangan Regional Department of Statistics.

The table shows that the most densely populated districts are Uychi, Naryn, Turakurgan and Namangan. The main factors contributing to this location, along with natural conditions, are the proximity of Namangan city, the center, and the fact that these 4 districts are among the smallest districts in the Namangan region in terms of area. The above-mentioned factors also serve as the main factors in the districts belonging to the remaining groups. The density indicator differs by more than 11 times between Pop district, which has the lowest population density, and Namangan district, which has the highest population density.

In fact, the above-mentioned average population density corresponds to the “gross” indicator of density. Professor A.S.Soliyev noted that the “gross” indicator applies to all areas of the administrative district (regardless of whether the population is inhabited or not, including desert or mountainous areas). Therefore, determining population density at the level of rural settlements gives good results. In this case, the analysis becomes deeper and more accurate if the density is calculated, especially in relation to land used for agriculture [4]. This

idea was also emphasized by the Georgian scientist V.Sh.Djaoshvili. Professor O.R. Rahmatullayev developed the “land capacity” standard of population for large oases of Uzbekistan.

Population studies scientist Z.N. Tojiyeva used the concept of the demographic capacity of the territory in her research. The demographic capacity of the territory is a variable quantity. Since a large area of land, on the contrary, a small area can support several times more people, it is based on the analysis of the most important natural components for daily life. For example, these include providing the population with housing, the availability of land suitable for the construction of industrial enterprises, water resources, recreational resources, the organization of food reserves, etc. [3].

The distribution of the population by hypsometric heights is also unique. For example, if we look at the distribution of the population by hypsometric heights around the world, about 60 percent of the population lives at an altitude of up to 200 meters above sea level, 11 percent at 500-1000 m, 4 percent at 1000-1500 m, 2 percent at 1500-2000 m. and only 1 percent at 2000 m and above [5].

Since the territory of Namangan region is uneven, settlements are located at different altitudes. It is known that as altitude increases, temperature and air pressure decrease, while precipitation, plant species and numbers increase. These natural factors have a different impact on the economy of the regions, specialization, population size and density, size of settlements, appearance and health of people, so their study is even more important.

The territories of the republic are divided into altitudinal zones and regions by scientists according to different directions and areas of population distribution. In particular, Q.Z. Zokirov, T. Jumayev, A. Soliyev, M. Nazarov, Z.N. Tojiyeva, L.Z. Ibragimov and others conducted research in this area. In particular, academician Q.Z. Zokirov, as a result of many years of studying the

vegetation of the Zarafshan Valley, proposed dividing the valley into 4 regions - desert, hill, mountain, pasture, while A. Sagatov, having studied the natural conditions of the republic, divided it into three large regions: "plain and foothill oases", "deserts", "high foothill and mountainous regions".

Mountain scientist T. Djumayev notes that 10 percent of the total population of Uzbekistan lives in the mountainous regions, that is, above 600 meters above sea level. According to the author, the highest rural settlements are located between 2500 and 2700 meters [2]. Since the highest populated parts of Namangan region are around 1200 meters, there is no rural settlement that corresponds to T. Djumayev's research.

L.Z. Ibragimov divided the districts of southwestern Uzbekistan into the following zones based on their altitude above sea level: Steppe (up to 400 meters); Foothills (400–1000 meters); Mountainous regions (above 1000 meters) [1].

Based on the studies conducted by the above scientists, the distribution of the population in the districts of Namangan region by altitudinal regions was studied. The relief of Namangan region is uneven, decreasing from the east and southeast to the north and northwest and southwest. Depending on the relief, settlements are located at different altitudes. Most of the region's territory falls on the foothills (up to 400-1000 meters). To make the study more effective, the height above sea level of each settlement in the districts of the region was studied using the Google Earth Web cartographic program, and the settlements were divided into smaller groups according to their altitude (Table 2).

Table-2

Division of Namangan region districts into subgroups based on altitudinal regions (2024)

№	Districts by altitude region	Small groups	Districts	District area (thousand km^2)	Population (1000 people)
1	**Desert steppe** (Up to 400 meters)	–	Mingbulak	0,74	136,9

2	**Foothills** (400-1000 meters)	Up to 400-600 meters	Namangan d.		192,7
			Uychi		232,3
			Naryn		175,8
			Pop		235,7
			Uchkurgan	290	185,4
			Turakurgan	0,33	192,7
		Up to 600-800 meters	Chartak	0,36	214,9
			Chust	0,92	285,6
		Up to 800-1000 meters	Yangikurgan	0,54	237,1
			Kasansay	0,51	227,9
3	**Mountainous areas** (1000 meters and above)	–	–	–	–

The table was compiled by the authors based on data from the website https://earth.google.com/web and the Namangan Regional Department of Statistics.

The terrain of the districts where settlements are located is not always flat, the highest and lowest points can differ from each other by 10–20, sometimes up to 20–40 meters, or even more. This is especially noticeable in mountainous areas. Therefore, the average height of the settlement was taken as the basis for determining the height of settlements. The districts of the region differ from each other due to the location of settlements at different heights.

According to the information presented in the table, due to the fact that the Mingbulak district of the region is mainly composed of plains up to 400 meters high, most of the settlements are located at altitudes up to 400 meters.

On the basis of studies, it turned out that the population of Namangan region is located mainly in areas with a height of 400-1000 meters, while the population with mountainous areas that live above 1000 meters is practically non-existent.

As the population in settlements increases and develops, they increasingly expand the territory in which they live, seeking to use more resources, which in many cases can lead to negative consequences. The fact that settlements in the districts of Namangan region are located at different altitudes is important in the location of the population. Because the areas around streams and springs serve to develop small-scale irrigated agriculture, which is important for partially

meeting the daily needs of the population for vegetables and melon crops, while the hills on the slopes of the mountains are important for dry farming. The highlands of the mountains are used as pastures for livestock. The population has been taking advantage of such opportunities for a long time. Therefore, viticulture and horticulture are well developed on the slopes and hills of the districts where there is water. The location of settlements in accordance with the height leads to the development of diverse types of farming.

Conclusions: Studying the distribution of the population by altitude is important for the management of socio-economic development, sustainable management of natural resources, and adaptation to climate change. After all, areas located in altitude zones are often close to river sources. The management of water resources in these places determines the supply of agriculture and drinking water. Changes in air temperature and pressure depending on altitude create different living conditions. This leads to the adaptation of the specific lifestyle, work activities, and health of the population living in relatively high areas to climatic conditions. While lowland regions are favorable for agriculture, pasture and animal husbandry prevail in relatively high regions. Agricultural methods in highland regions are based on the traditional knowledge and experience of the local population.

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