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DEMOGRAPHIC LOAD IN THE TERMS OF LANDSCAPE-ALTITUDE ZONES OF THE FERGANA VALLEY

Abstract. *The article analyzes the distribution of the population of the Ferghana Valley - a region of Uzbekistan, characterized by a high population and a small area of territory, in the context of landscape-altitude zones. In the work, the population density of the lower administrative-territorial units of the regions of the Ferghana Valley is calculated not in relation to their entire area, but in the context of the contours of landscape-altitude degrees (territory types), in particular, alluvial plains, ancient alluvial plains, proluvial-alluvial plains of alluvial fans rivers, interadyr alluvial-proluvial plains, adyrs, foothill proluvial plains and low mountains. The value of the demographic load on various landscape and altitudinal stages of the Uzbek part of the Ferghana Valley has been calculated. The natural-geographic factors that influenced the differences in the demographic load on the landscape-altitude levels of the region under study are characterized.*

Key words*: landscape high-altitude zones, natural geographical factor, demographic load, population density, natural demographic potential.*

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ДЕМОГРАФИЧЕСКАЯ НАГРУЗКА В РАЗРЕЗЕ ЛАНДШАФТНО-ВЫСОТНЫХ ЗОН ФЕРГАНСКОЙ ДОЛИНЫ

Аннотация. *В статье анализируется размещение населения Ферганской долины – региона Узбекистана, отличающегося высокой численностью населения и небольшой площадью территории, в разрезе ландшафтно-высотных зон. В работе плотность населения низовых административно-территориальных единиц областей Ферганской долины рассчитана не по отношению ко всей их площади, а в разрезе контуров ландшафтно-высотных степеней (типов территории), в частности, аллювиальных равнин, древних аллювиальных равнин, пролювиально-аллювиальных равнин конусов выноса рек, межадырных аллювиально-пролювиальных равнин, адыров, предгорных пролювиальных равнин и низких гор. Рассчитана величина демографической нагрузки на различные ландшафтно-высотные ступени узбекистанской части Ферганской долины. Охарактеризованы природно-географические факторы, оказавшие влияние на различия в демографической нагрузке на ландшафтно-высотные ступени исследуемого региона.*

Ключевые слова: *ландшафтно-высотные зоны, природно-географические факторы, демографическая нагрузка, плотность населения, естественный демографический потенциал.*

Introduction and problem statement. Today's research work in modern science requires the improvement of existing research methods and methods, enrichment with innovations. Thanks to this, achievements are achieved aimed at solving the theoretical and practical problems of science in front of society. As a result of changes in the socio-economic life of society, the requirements and tasks of scientific research are becoming more and more

relevant, complicated and modernized. In the economic and social geography of the modern era, research is taking place that requires such complication and renewal, which is the reason for the integration and constant renewal of science.

Environmental problems arising from the tension between nature and society require a new approach to scientific research. As an object of economic geography, the availability of resources, comfort in terms of living, resistance to external influences of the territory, considered as an object of economic geography, remain the main factors that determine its economic geographical status. With an increase in the population, the territorial organization of the population requires a new approach, the introduction of a long-term program goal. Therefore, it is necessary to revise studies of the territorial organization of the population based on the requirements of the modern era.

Study of the problem. A change in the social situation in a society affects the distribution of production and non-production spheres in this society, changes the relationship and connections between them, which ultimately leads to a change in the territorial organization [16]. The principles of the territorial organization of production and nature management also change when a society switches to the path of independent development or falls into colonialism [15]. These conclusions, made as a result of studying the history of the development of foreign countries, are also characteristic of our country today.

The concept that reflects at first glance the natural-geographical state of the territory, showing its capabilities and recognized as the most ancient and at the same time the most modern term of geography, is landscape. The famous American geographer Richard Hartshorne stated in one of his works that "Landscape is undoubtedly the most important word in the geographical language" [8]. During the last century, the concept of landscape, despite various criticisms, has been recognized by almost all major scientific schools of world geography. The landscape approach is widely used not only in natural geography, but also in historical, social, economic, political, cultural, military, geoecological, and practical geographical studies. In this regard, the well-known representative of the St. Petersburg geographical school A.G. Isachenko in the 80s of the last century stated that it opens up unprecedented opportunities for geographical research based on the landscape approach [9].

In economic and social geography, as well as in the study of the territorial organization of society, studies within the network of landscapes, which are the natural and geographical basis of regions, have become widespread [2, 5, 7, 11]. Especially in population geography, there is a high theoretical, methodological and practical potential for using the landscape approach. So far, the landscape approach has not been widely used in scientific research on the geography of the population of the Ferghana Valley, and the presented study can be considered a scientific innovation in this regard.

Taking into account various indicators of the landscape, even when conducting studies of the territorial distribution of the population, increases the geographical significance of the study. After determining landscape indicators in the territorial distribution of the population, it is also important to determine the criteria for their impact. In this study, special attention is paid to geomorphological, climatic, soil and hydrological factors of the area as indicators characterizing landscape criteria. Also in such studies, the calculation of population density based on the principles of landscape in the territorial distribution of the population is of practical importance. This not only reveals real differences in the population density of the valley, but also determines the level of population of certain landscapes.

Sh. Sharipov analyzed the use of the landscape approach in determining the population density in the territory, the occupation of the territory by anthropogenic elements and anthropogenic changes. When calculating population density in landscapes, landscape population density was calculated by dividing the number of inhabitants in each landscape by its area [18].

In studies conducted on the territorial distribution of the population of the Ferghana Valley, it is noted that an important role in the territorial distribution of the population of the

valley is played by the hydrological factor and conditions [5]. This aspect is directly related to the development of irrigated agriculture. Therefore, it must be taken into account that the dense hydrological network of rivers and streams located in the valley is the most important link in the natural and landscape factor of population settlement in the Ferghana Valley.

The aim and objectives of the work. The aim of the presented study is to calculate the indicators of the demographic load on the landscape-altitude stages of the Ferghana Valley and to identify the features of the distribution of the population of the region in the context of the geosystem organization of its territory.

To achieve this goal, it is necessary to solve the following tasks:

analysis of the role and importance of the natural factor in the theory of the territorial organization of the population, improvement of existing methods;

Calculation of real conditions of population density in landscape high-altitude areas and administrative-territorial units of the Ferghana valley based on cartographic and statistical analysis;

it is necessary to determine the priorities for the use of natural landscape opportunities in improving the territorial organization of the population.

Materials and research methods. In carrying out the study, first of all, information about the population of each region and the amount of irrigated land is used. These data will be needed in the analysis of the natural demographic potential of the regions based on the methodology of a special assessment of natural and geographical conditions. Materials of the Department of Statistics of the Republic of Uzbekistan, data from the State Committee for Land Resources, Geodesy, Cartography and the State Cadastre of the Republic of Uzbekistan, as well as literature on the topic, as well as systematic analysis, comparatively, geographical and statistical methods were used in these calculations.

Results and its discussions. Territorial settlement of the population is a long historical process associated with human settlement of the earth's surface. There is a direct, organic connection between the territorial distribution of the population and its indicators of environmental management. The influence of the natural factor on the density or sparseness of the population in a particular region is the result of a long historical process. In particular, it can be observed that the basic goods of nature have a high economic potential in densely populated areas. The distribution of the population is directly related to the development of the territory. In the science of the development of the territory, two different worldviews have developed. The first belongs to D. Ricardo. He argues that people have always been the first to develop the most productive, conveniently located areas. The second opinion about the development of the territory is opposite to the first, and its author is the American economist G. Ch.Karry. He says that mankind first took possession of the less fertile lands, and then moved to the fertile soils. The reason for this is that man's ability to influence nature is limited in the early periods. Fertile areas are covered with forests or dense thickets, and a person did not have the opportunity to develop it, cut down forests, so he first improved less fertile soils, and then improved tools and moved on to developing more fertile areas [2]. We see that both of these seemingly contradictory ideas were true for their time during the formation of settlements in the Ferghana Valley. This is discussed in detail in the studies of R. Kholikov. The first settlements in the valley were formed in the hollows of the hills and mountain ranges. Including Sokh, Okhna, Kyzylkia, Kuva, Ershi, Osh, Koson, Chust. Then, at the next stage, river valleys were developed. [13].

The first natural-geographical knowledge existed before social geography, because nature existed even before the formation of society. In the evolutionary development of natural science, landscape science, which is at the center of this discipline, has acquired great importance. Because the landscape embodies all natural and geographical processes and their results. [17]. Therefore, among the most fundamental sciences of geography, landscape science occupies an important place. One of the most widely used terms in this science is the concept of landscape. Translated from German, it means "land" - "land", "schaft" - "landscape". The

suffix "shaft" in this term expresses the concept of "relationship" and "interdependence". There are many definitions of landscape, among which the definition given by Yu. Kolbovsky should be noted. In his opinion, the landscape is a separate part of the earth's surface with almost the same geological base, relief, climate, soil, flora, fauna and hydrological regime and is characterized by the presence of harmony and interconnection of the above components. [12].

It should be noted that the concept of landscape is essentially an integral part of natural geographical laws, regardless of the sense in which it is used. Recently, terms such as "cultural landscapes", "agrolandscapes", "urban landscapes" have appeared, which do not fully comply with natural geographical laws, and which in themselves give an economic and geographical meaning, so landscape studies have become more relevant. . For this, natural (geographical), anthropogenic, cultural and anthropogenic types of landscapes are distinguished according to their geographical significance. The classification of Yu.I. Akhmadaliev [2] indicates that the boundaries of landscape units do not correspond to the boundaries of administrative-territorial units. This situation emphasizes the importance of economic-geographical classification and zoning for the development of specific recommendations, since it does not allow the use of such statistical data as the order of land use and its change in selected landscape units. This means that although it allows the use of economic indicators in the analysis of land-use productivity, it strengthens the link between science and practice. [2].

It is known that the geological structure and relief, considered as the main components of the landscape, are the main factors influencing the location of the economy and population. Analyzing the map of the location of the economy and population in the world, it becomes clear that the economy and population are scattered over mountainous regions. Although modern statistical reports are calculated according to administrative boundaries without taking into account this feature of the landscape, in the studies conducted by Yu. Akhmadaliev on the example of the historical-geographical region of Sokh, it is substantiated that such an approach does not reflect the original landscape of the place. [2]. However, based on this approach, it is not so correct to consider mountain landscapes always an obstacle to settlement and economic development. It is known that areas that are not so convenient for organizing agriculture or settlements are the most convenient for organizing recreation and tourism, protected areas, health centers of various kinds. The ways of obtaining economic benefits from such landscapes can be seen on the example of the Bostanlyg district of the Tashkent region, the Fergana (Shakhimardan) districts of the Fergana region.

However, in studies conducted on the territorial distribution of the population of the Ferghana Valley, it is noted that the hydrological factor and conditions also play an important role in the territorial distribution of the population of the valley. [6]. This aspect is directly related to the development of irrigated agriculture. [10]. Therefore, the most important link in the natural and landscape factor of population settlement in the Ferghana Valley is the hydrological network of rivers and streams located in the valley. The role of the hydrological factor in the resettlement of the population was fully revealed by R. Ballieva using the example of the Karakalpak ethnos. According to him, the ethnic group of the Karakalpaks initially settled in the river delta. Later, with an increase in the ethnic group, some of them began to settle by the sea (the Aral Sea), and later others moved along the river (along the Syr Darya), upstream. [4].

Of course, other components of the landscape also have a significant impact on the distribution of population and economy, as indicated above. It is advisable to separately study the role of the hydrological factor in our continental region.

If the above factors have an impact on the distribution and development of the population and economy on a nationwide scale, then it can be seen that the influence of the soil factor is also significant when studied on a regional scale. From the statistical data, it can be seen that areas with the highest agro-potential soil (credit score) in the Ferghana Valley also have high population and farm location indicators. Our opinion is confirmed by the fact that the level of settlement of the population and economy in the administrative districts of Asaka,

Oltinkol, Izboskan, Tashlok, Uchkoprik, Buvayda and Uchkurgan in the valley is proportional to the soil quality indicator. Of course, through a deep scientific analysis of the influence of each component of the landscape on the economy and the resettlement of the population, it is possible to develop a norm of "land capacity". In this case, the tasks of the science of geography are more clearly manifested in the development of a strategy for the socio-ecological sustainable development of regions.

The calculation of indicators corresponding to 1 km^2 of area, recognized as the most important research method in economic geography, has become less relevant. As a result of approaching the region without taking into account its geographical capabilities, confusion arises between scientific research and the real state of affairs. As indicated in previous studies [1], in the economic-geographical assessment of regions or in the implementation of any organization in the region, it is necessary to take into account its natural-geographical, natural-landscape capabilities. But this process requires specific complications, the development of new research methods [3].

First of all, when calculating population density, a specific cartographic method for calculating population density on landscapes is needed, in contrast to the method widely used in economic geography. To do this, it is necessary to clarify the boundaries of modern landscapes that we offer at the moment. Height schemes of individual landscapes are determined by cartographic methods. Undoubtedly, one of the main criteria for identifying the landscapes of the Fergana Valley is altitudinal zonality. Because the pattern of altitudinal zoning is an important unit of landscape division.

The landscape class classification in landscape classification is based on the morphotectonic characteristics of landscapes, and is mainly divided into two landscape classes of mountains and plains. If we take into account the hypsometric factor in the classification of mountain landscapes and flat landscapes, i.e., the peculiarity of the arrangement of landscapes by the formation of steps, then landscape subclasses can be distinguished within landscape classes [19].

But it is not important to divide landscape classes into such small parts from the economic and geographical point of view. Also, on the basis of the hypsometric factor for distinguishing all landscape classes, it was advisable to generalize the various landscape classes and subclasses conventionally identified by the Ferghana Valley and to identify areas of landscape height in the studies [14].

For this reason, the identified 7 landscape altitudinal zones are alluvial plains below 380 m, 380-450 m - ancient alluvial plains, 450-500 m - proluvial-alluvial plains of alluvial fans, 500-700 m - inter-aperous alluvial-proluvial plains, 900-1200 m adyr, 850-900 m foothill alluvial plains and areas above and 1200 m stood out as low mountains. It should be noted here that the system of heights we have identified does not correspond to the laws of pure natural-geographical azonality. The reason is that the main criterion for identifying these heights is the approach from the point of view of the location of settlements.

In the previous paragraphs, it was pointed out that in calculating population density, the gross coefficient widely used in economic geography, obtained by dividing the population of an administrative region by its area, cannot reveal exact differences in area in many ways. Because with a population density of more than 340 people in one district (Fergana region), indicators of very low population density in hilly and low-mountainous areas are generalized with high population density in areas convenient for human habitation (areas near rivers or streams, conical expanses). This limits the ability to know the full state of the area. The boundaries of landscape high-altitude zones are determined and the population of each corresponding settlement is studied.

In this case, when two landscape high-altitude zones of a small settlement coincide, the results were generalized for the area to which 2/3 of the area of the landscape high-altitude zone belongs. As a result, population density indicators and a map of modern landscapes of the Ferghana Valley were developed (Fig. 1, Table 1).

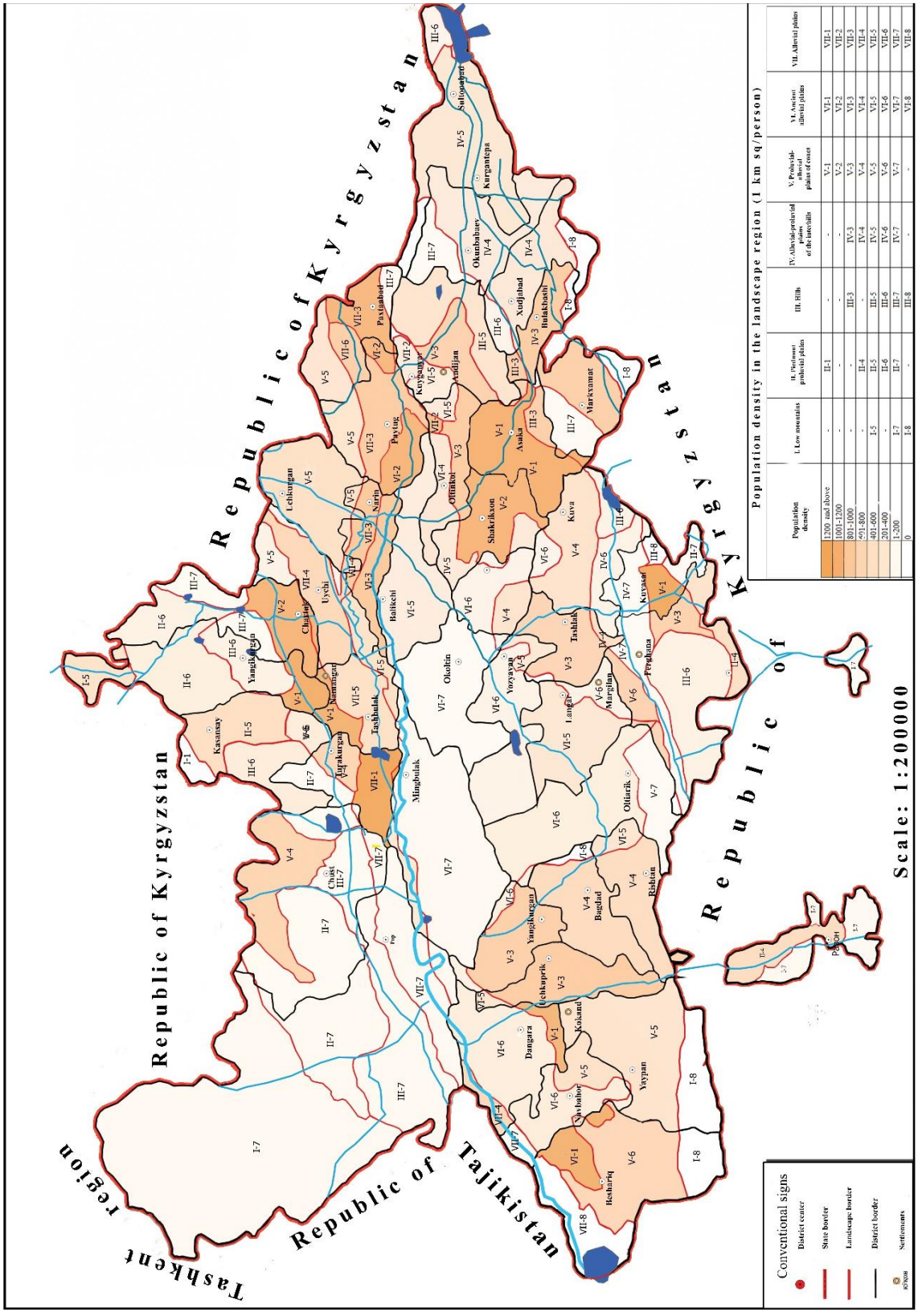


Fig. 1. Differences in the population density of the Ferghana Valley depending on the landscape of administrative regions

Table 1

Population density of the Fergana Valley by landscape high-altitude zones

Landscape high-rise zone	Area of landscape high-altitude zones (thousand km^2)	Proportion landscape high-altitude zone (in percentages)	Population in landscape high-altitude zones (persons, 01.01.2020)	Population density (person 1 km^2 of area, 01.01.2020)	Share of population in landscape high-altitude zones (in percentages)
Low mountains	2,399	12,87	124142	51,8	1,28
Piedmont proluvial plains	1,688	9,06	426251	252,5	4,41
Hills	2,288	12,27	498562	217,9	5,15
Alluvial-proluvial plains of the interhills	1,402	7,52	1146031	817,5	11,85
Proluvial-alluvial plains of cones	5,116	27,44	4444952	868,8	45,95
Ancient alluvial plains	4,066	21,81	1611248	396,3	16,66
Alluvial plains	1,685	9,04	1421914	843,7	14,70
Total	**18,645**	**100,00**	**9673100**	**518,8**	**100,00**

These tables were calculated by the author on the basis of data from the Agency on Statistics under the President of the Republic of Uzbekistan and according to A. Nikanorova [14].

A number of advantages were revealed in the analysis of the size and density of the population of the modern Ferghana Valley by zoning the natural landscape-divided valley into 7 landscape-altitude regions. First, the exact population density of the areas in which the population could be settled was determined. Secondly, the number and density of the population in individual landscape high-altitude areas of each administrative region will be known. Thirdly, all administrative regions are summed up and the total population density of the valley landscapes suitable for humans is calculated.

According to this methodology, when analyzing the population of the landscape highlands of the Fergana Valley, only 1.3 percent of the population belongs to the landscape of low mountains. However, it was found that the area occupied by it is larger than the area of the landscape of foothill proluvial plains, hills, intermountain alluvial-proluvial plains and alluvial plains. Due to the small size of the area, the population density of the valley in this landscape is 51.8 people per 1 km^2.

This means that the population density of the region is 10 times lower than the general level of the valley and almost 18 times lower than the area of proluvial-alluvial plains of cone-shaped plains.

The highest landscape high-altitude zone in terms of population density is proluvial-alluvial plains of alluvial cones. The population density is 868.8 people per 1 km2. 45.9% of the population of the valley lives in the area of landscape high-altitude zones of proluvial-alluvial plains of alluvial cones. The second most dense area is a landscape of alluvial plains occupying the banks of the Syrdarya, Norin and Karadarya, and the density in these areas is 843.7 people. per 1 km^2. But this landscape occupies only 9 percent of the high-rise area. In terms of population density, the third landscape high-altitude zone is a landscape of alluvial-proluvial plains, where the density corresponds to 817.5 people. per 1 km^2. These results show that the landscape areas of proluvial-alluvial plains of cone-removal, alluvial-proluvial and intermountain alluvial-proluvial plains have some advantages in terms of population and economic use. Because of this, the population density in these landscape regions differs sharply compared to other landscape high-altitude zones.

In terms of density, these 3 areas of landscape high-altitude zones have a total of

7,012,897 people, that is, about 3/4 (72.5 percent) of the population of the valley as of October 1, 2020. But these areas do not occupy even half of the valley (Table 1).

Conclusion. The calculation of the number and density of the population of the specified administrative region in certain regions of landscape height made it possible to reveal the exact population density of these regions. The calculation of the population density of each administrative region in this order shows not only the difference in population density between administrative regions, but also the differences in population density in natural landscape regions.

Based on the results of the above study, the following proposals were developed:

The allocation of individual landscape areas for each administrative area and the calculation of the corresponding population in them makes it possible to calculate the population of individual landscape units of a given administrative area;

When calculating the population and density of individual landscape areas of each administrative region, the most influencing factors on their settlement were selected;

To increase the practical value of the study, it is necessary to calculate the number and density of rivers and streams in each administrative region;

In Namangan, Fergana and Andijan regions, taking into account favorable natural and geographical conditions that ensure the stability of settlements, it is proposed to take into account the above factors in newly created settlements.

An analysis of the demographic indicators of the regions for each of the factors affecting the distribution of the population (geomorphological, climatic, soil and hydrological) makes it possible to obtain accurate results on the actual population density in modern society. Of practical importance is the allocation of the number and density of the population depending on individual natural and geographical conditions, the rationale for the influence of these natural and geographical factors on the life of the population, their assessment for human habitation and economic activity.

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