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MAPPING THE POPULATION OF NAMANGAN REGION USING MODERN GIS TECHNOLOGIES

Abstract: *This article talks about the location of the population of the Namangan region and the application of modern cartographic methods in compiling population maps, the importance and advantages of mapping in the geographical education of the population, as well as about the aspects of mapping which need to be paid attention to.*

Key words: *population of Namangan region, population location, geographic information systems, modern mapping methods, electronic maps, population maps.*

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Introduction

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At a time of rapid development of market relations, diversification and modernization of the economy, one of the main tasks is the scientific study of economic and social processes in the country and its regional structures. The study and analysis of these issues imposes great responsibilities on the scientific community. In particular, in the context of research in economic and social geography, the mapping of regional social and economic geographical events, the thematic map has a scientific and practical significance in the scientific presentation of the situation in this area.

The focus on the development of manufacturing sectors in the country, which play a special role in the formation of the national economy, as well as the implementation of all sectoral, network and regional policies in the country is to improve the living standards of the population. After all, human interests underlie any activity in society. As the President of the Republic of Uzbekistan Sh. Mirziyoyev noted, "Today, the main goal of our life, embodied in our Constitution, is to ensure the full protection of human interests." [1] Given the priority of such issues related to the population, the President proposed to declare 2017 the Year of Dialogue with the People and Human Interests in Uzbekistan, and highlighted the priorities in this regard.

Of course, in the scientific study of the changes that have taken place based on the above, the organization of population-related research and the mapping of regional details related to the location and development of the population are of practical importance. In addition, the location of the population and its structural features cause changes in space over time. In this context, the relevance of this scientific article is determined by the creation of new maps based on cartographic methods using modern geographic information systems to visualize the current state of the population.

Literature review. An analysis of the relevant scientific literature shows that a number of studies on the economic and geographical study of scientific and practical issues of population distribution have been conducted in the countries of the Commonwealth of Independent States, including our Republic. Thus, the theoretical and methodological bases of this problem in Uzbekistan are Z.M.Akramov, S.A.Avezov, M.Ishchanov, A.N.Ruziyeva, A.S.Soliyev, A.M.Sodikov, T.M.Mirzaliyev, A.Egamberdiyev, K.Gadoev, A.A.Kayumov, K.X.Abdurahmonov, Tadjieva, and have been extensively covered in the scientific work of others. Researchers from Namangan State University also provided details on population-themed maps. The maps in the research work of associate professor Sh. Jumakhanov (1999), H. Mirzaakhmedov (2003) can be cited in this regard. However, in the last 15 years, dynamically moving population maps have hardly been prepared in the study. This study differs from the above research in that it captures the processes of today's population.

Research Methodology. In this work, the methods of geographical comparison, cartographic, statistical, regional analysis, systematic approach were used.

Analysis and results. Namangan region is one of the most ancient regions of the country. The main part of the population is concentrated in the plains and foothills, where irrigated agriculture is developed, and in addition to farming, they are also engaged in animal husbandry and handicrafts. In the territory of Namangan region, the largest historical cities of its time, Kosonsoy and Akhsikent, played an important role in political, socio-economic and cultural life. Even today, the role of irrigated agriculture in the settlement of the population, the formation and development of fortifications is obvious. Political-military, socio-economic events at different historical stages had a strong impact on the location, growth, formation and development of fortifications. The current distribution of the population is due to the above complex processes that have been going on for a very long time.

Namangan region is one of the regions in Uzbekistan with a high level of natural population growth and urbanization. During 1897-1917, the population growth of the region increased by 72.1% or an average of 3.4% per year, in 1926-1939 by 31.0% or an average of 2.8% per year, in 1959-1979 by 85.3% or an average of 4.2% per year, and in 1980-1992 it was 42.3% or an average of 3.5% per year. Between 1926 and 1992, the region's population increased from 397.8 thousand to 1,651.6 thousand, or 4.2 times. In 1990-1995, the population increased from 1558.7 thousand to 1785.2 thousand people or 14.5% (average 2.9% per year), of which the urban population increased from 592.1 thousand to 674.2 thousand people or 13.8%. %, the rural population increased from 966.6 thousand to 1111.0 thousand or 14.9%. In 1995-2000, the population of the region increased from 1785.2 thousand to 1959.2 thousand people or 9.7% (an average of 1.9% per year), of which the urban population increased from 674.2 thousand to 735.3 thousand people or 9.0 %, the rural population increased from 1111.0 thousand to 1223.9 thousand or 10.2%. In 2005, the region's population reached 2,109.5 thousand people, which is 7.6% more than in 2000. During this period, the average annual population growth was 1.5%. In 2000-2005, the urban population in the region increased from 735.3 thousand to 785.6 thousand or 6.8%, and the rural population from 1223.9 thousand to 1323.9 thousand or 8.1% (Table 1). In 2006-2008, natural population growth was revived compared to previous years, averaging 2.1% per year, while in 2008 this figure was 1.2%. In Kosonsoy, Uychi, Namangan, Mingbulak, Naryn, Pop and Turakurgan districts, the natural population growth rate continues to decline.

Table 1. Population growth in Namangan region

Years	Population (thousand people)	Including		As a percentage of the total population	
		City dwellers	Villagers	City dwellers	Villagers
1897	168,9	14,9	154,0	7,1	92,9
1917	290,7	16,2	274,1	7,9	92,1
1939	521,4	103,2	418,2	19,8	80,2
1970	847,0	242,7	604,3	29,0	71,0
1990	1558,7	592,1	966,6	38,0	62,0
2000	1959,2	735,3	1223,9	37,6	62,4
2010	2298,0	1470,1	827,9	64.0	36
2015	2578,7	1649,8	928,9	63,9	36,1

Source: Abdullaev.O. Handbook of Namangan region (nature, population, economy) and data of the Namangan regional department of statistics.

The high rate of natural population growth until the 90s of the twentieth century is primarily due to the large share of the rural population in the population (62.6%), the preservation of polygamy in accordance with historical, national traditions, the relatively high average life expectancy is determined by the stability of mortality. Natural growth, in particular, was high among the local population. In 1970-1992, the birth rate was 38-40 per 1,000 people, the death rate was 6-7 per 1,000 people, and the natural increase was 30-32 per 1,000 people. 37.6–40.6, mortality was 5.7–10.1, and natural increase was 30.1–30.5, respectively. In 2007-2008, the birth rate per 1,000 people in Namangan region was 50.1-53.2 people, and the mortality rate was 10.0-10.6 people. In recent years, due to the high birth rate and low mortality in the population, the natural growth rate in the region has slightly improved, and in 2007-2008 these figures were 40.1-42 per 1,000 people, respectively. 6 people (Table 2).

Table 2. Births, deaths and real population growth per 1,000 people in Namangan region (per capita)

Years	Number of births	Number of dead	Natural growth
1940	31,6	12,7	18,9
1965	34,6	5,8	28,8
1970	38,5	5,4	33,1
1975	38,8	7,2	31,6
1980	43,3	9,1	34,2
1985	39,0	7,0	32,0
1990	35,6	5,7	30,1
1995	32,5	5,8	26,7
2000	20,9	5,1	15,8
2005	20,2	4,9	15,3
2010	22,2	4,6	17,6
2015	24,0	4,8	19,2

Source: Abdullaev.O. Handbook of Namangan region (nature, population, economy) and data of the Namangan regional department of statistics.

In addition to the impact of rapid market relations, market structure and institutional changes on natural population growth, the formation of the psychology of not more than two children among young families and the "child price" - child The cost of "investment" for a child, including upbringing, education and other expenses, has significantly increased. In addition, the process typical of economically developed countries has seen an increase in the proportion of older people in the country, including in Namangan region, which in turn has led to a gradual intensification of labor migration, which began in the mid-1990s. affected to a certain extent.

Namangan region ranks third in Uzbekistan in terms of population density (Andijan, Fergana). The main part of the population is located between the Naryn and Karadarya rivers, in the plains between the Syrdarya and the hills, and 80.0% of the region's population lives there. The ethnic composition of the Namangan region has changed significantly over the past 150 years and has become one of the most multi-ethnic regions in Uzbekistan. Today, the region is home to more than 50 different nationalities, peoples and ethnic groups. The high proportion of Uzbeks in the region's population is explained by high natural growth and slow migration.

Today, many databases need to be created for modern mapping. At the same time, the processing and analysis of data using modern computing and programming tools brings a lot of conveniences. Consequently, one of the most pressing issues is the creation of automated system maps that provide detailed information about various sectors of the economy on the basis of modern software based on modern computer technology. In particular, it is advisable to use ArcGIS software based on modern Geographic Information Systems (GIS) when creating thematic maps of various fields.

The use of satellite imagery in population maps to show the location and characteristics of a population is important because aerospace imagery makes it easier to identify settlements and make it easier to identify their functional characteristics [2]. When compiling population maps, it is advisable to follow scientific principles, such as depicting the interconnectedness of all beings. This principle should be understood in the following senses:

- population-related details of natural geographic events and phenomena keep in touch with In this case, the interdependence and interdependence of the components, that is, the relationships between the components should be reflected on the map;

- in the general geographical sense, in other words, to act in the interests of the integrity of geography. For example, the combination of economic and social processes;

- that is, the population and settlements are an integral part of the formation of economic sectors in the regions;

- population maps take into account the social and economic changes taking place in the region, regardless of the size of the area (change in the status of settlements, construction of new housing, etc.).

After all, population cards should serve as a basis for future use by representatives of various industries. In addition, it should be noted that the principle of modernity should be fully reflected in the current population maps, and there are several reasons for this. The strengthening of international economic, cultural and political ties with our country as an equal member of the world community, as well as the mapping of the territorial location of industries and population indicators in direct connection with market relations is one of the urgent social requirements. In addition, the creation of dynamic maps of natural, economic and social processes allows you to monitor changes in space.

It is known that nature and society are constantly changing, evolving. It should be noted that the nature and society are intensifying. Dynamic maps, on the one hand, increase the science of maps and, on the other hand, provide ample opportunities for geographical prediction. For example, when perennial indicators and current details are displayed on population maps through various additional and geographical elements, it evokes a range of ideas and logical considerations in the user.

Geographical forecasting is the most important scientific direction for the science of geography in the future, which determines its social prestige, and the prediction of changes through population maps provides the basis for great scientific considerations and scientific conclusions.

It should be noted that the modernity and prospects of geographical cartography are difficult to imagine without Geographic Information Systems. Unfortunately, research in this area is currently insufficient. It is advisable to use modern technical equipment and foreign achievements in mapping research.

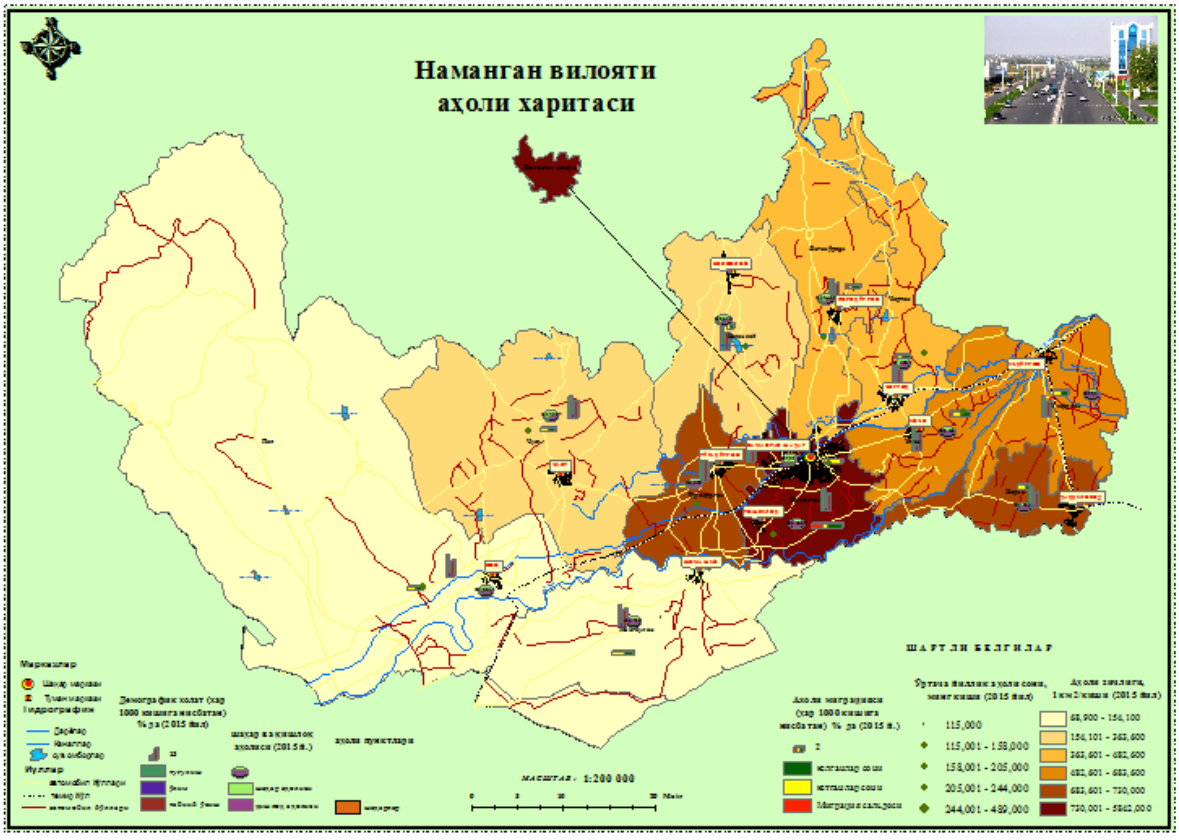

Figure-1. Population map of Namangan region.

In recent years, the geographic information system has been widely used in Uzbekistan for mapping settlements. GIS technology allows you to collect and store this isolated data in a single view, update, analyze, perform any operations, track all changes, obtain various district maps, plans, tables. Thus, the geoinformation system on population maps provides its users (medical, police, etc.) with the following benefits:

- linking and agreeing all information to a single database to receive a variety of information related to the population;

- use a regional geographic information system to receive, analyze and make decisions on various levels of fragmented information;
- reduce the cost of creating and updating population cards.

Today, geographic information systems are widely used in almost all sectors of the economy. In particular, in the creation of population maps, the creation of a population database, the study of settlements, their development, etc. Using the above analysis and conclusions, approaches and methods, a 1: 200,000 population map of Namangan region was created using a modern geographic information program.

The map shows the population density per square kilometer, which shows Namangan, Turakurgan and Naryn districts as the most densely populated districts of the region. At the same time, there are visual data on the average annual population, population migration, demographic situation per thousand people, urban and rural population and settlements. As can be seen from the map, the population of the region is concentrated mainly around the rivers flowing from the northern, eastern and central parts. Of course, the process of historical formation has a great influence on such a settlement in the region. After all, the population of these areas has been living since ancient times - (Figure-1).

Conclusion/Recommendations.

Based on the above, the main conclusions and recommendations of this study are:

- Ensuring the completeness of the topic in the creation of a system of population maps of the region, the regional structure of the mapped area, the main requirements for mapping the area, such as the scale, content of maps, methods of mapping, as well as the use of new technologies;
- Namangan region differs from other regions of the country not only by its natural and economic geography, but also by its social and geographical features. This is reflected in the natural and mechanical movements of the population of the region, the development of urbanization, the location of the bulk of the population in river basins, density, labor force indicators, etc.;
- The analysis of the prepared thematic map shows that the location of the population is largely related to hydrographic objects and roads;
- A thematic map of the population of Namangan region was developed on the basis of statistics, taking into account the specifics of the population of the region;
- Today, population maps (population, density, formation of a network of cities, functional types of cities and towns, urban and rural population, its location features, etc.) are of practical importance in improving, managing and forecasting the population.

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