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ABSTRACT
of the dissertation for the degree of Doctor of Philosophy

DEMOGRAPHIC DEVELOPMENT PROBLEMS OF THE LIVING QUALITY OF THE POPULATION IN THE GREATER CAUCASUS PROVINCE

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Field of science:	Geography
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Baku – 2025

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GENERAL CHARACTERISTIC OF THE WORK

The actuality of the topic and level of research on the subject. The main principles of the country's economic development are based on creating social and cultural economic facilities and infrastructure in accordance with the population size and the organization of social protection for the population to improve the quality of life. The improvement of the quality of life of the population is a priority task in addressing the social and economic development issues of countries. Improving the living quality of the population in the Republic of Azerbaijan is a fundamental component of the state's social policy. The investigation of the quality of life issues of the population and the identification of directions for their resolution is of great importance in ensuring socio-economic development. One of the most important conditions for solving these problems is the extensive use of complex evaluation methods.

The pace of improvement in the quality of life is largely dependent on a unified socio-economic system. It is known that the transitional period in the country, along with the decline of economic sectors and production, has reduced the quality of life for the population. Existing problems in the agricultural sector have reduced the population's income-generating opportunities, led to a deterioration in the development of infrastructure sectors, and increased poverty levels. Additionally, the financial crises, inflation, and the devaluation of the manat in our country in recent years have once again reduced the income of the population, while the increase in product prices has negatively affected the quality of life of the population.

The territory of the Republic of Azerbaijan has a complex physical-geographical position, and the unstructured distribution of the population and employment sectors within the Greater Caucasus province, where industrial centers are located, has led to the emergence of regional disparities in the level of urbanization and a decrease in the population in certain settlements. The main income-generating sectors are located in the Baku economic region, which

indicates that there is a high migration flow from other regions to this area. In this regard, ensuring sustainable socio-economic development through the efficient use of existing resources, reducing poverty, improving the quality of life, and maintaining a balance in the socio-economic development of regions are among the main areas that require solutions by the state. However, the solutions to the problem continue to remain unresolved to this day. Considering this discrepancy, there is a significant need to conduct a dissertation on the study of demographic development problems related to the quality of life of the population in the Greater Caucasus province.

The quality of life of the population was studied by C.F.Alfredo, D.F.Cella, V.M.Zherebin, A.N.Romanov, M.Sh.Salimov, E.V.Ryumina, T.E.Minyakova, A.V.Zhalnina, J.B.Guliyev, U.K.Alekberov, A.N.Muradov and others, and in the field of territorial organization of the economy, social service sectors, population dynamics, settlement, demographic development in Azerbaijan by Sh.G.Demirgayayev, R.M.Mehraliyev, A.M.Hajizadeh, Sh.Y.Goychaysky, Sh.M.Muradov, T.G.Hasanov, V.A.Afandiyev, Ch.N.Ismayilov, Z.N.Eminov, N.A.Pashayev, N.H.Ayyubov, M.O.Sadigov, Z.T.Imrani, R.N.Karimov, E.S.Badalov, H.M.Tahirova, and others conducted extensive research.

Object and subject of research. The object of the study is the Greater Caucasus province, located in the northern, northwestern, and northeastern zones of the Republic of Azerbaijan, and the subject is the study of the problems of demographic development living quality of the population.

Purpose and objectives of the study. The main **objective** of the research work is to study the quality of life and demographic aspects of the population in the Greater Caucasus province, to identify the demographic problems that have arisen in this context, and to analyze the key socioeconomic factors influencing demographic development. Additionally, determining the interaction of indicators for assessing the quality of life, as well as identifying the impact of “State Programs” on the quality of life and demographic situation of the population in the Greater Caucasus province.

The following tasks have been outlined in the dissertation work to identify the demographic development problems of the quality of life of the population in the Greater Caucasus province:

- to demographically study the living quality of the population, to determine the main criteria for selecting indicators for the assessment of quality of life;
- to reveal the processes occurring in the demographic development of the population's quality of life and to analyze the socio-economic and ecological factors influencing it;
- to determine the interrelation of the quality of life indicators and to assess the quality of life in administrative districts;
- to identify the ways to regulate the quality of life of the population and to investigate the role of state programs.

Research methods. The demographic situation in the Greater Caucasus province and the processes occurring in the indicators of the population's quality of life have been studied using comparative analysis and demographic analysis methods. To investigate the changes in the indicators of the population's quality of life, system-structural methods and field research have been employed to study the socio-economic conditions of the population. Geographic modeling has been used to study and address demographic problems, and cartographic methods (ArcGIS software) have been utilized to transfer the obtained data onto maps. The processing methods of MS Excel and its software like Xlstat have been used during mathematical-statistical calculations in the research work.

The main provisions to be defended:

1. Regional characteristics of the formation of demographic development of the living quality of the population in the Greater Caucasus province;
2. Assessment of demographic, economic, social, and environmental factors affecting the quality of life of the population in the Greater Caucasus province and regional differences;
3. Establishing a development model to eliminate problems in the quality of life of the population in the Greater Caucasus province, changes in the quality of life of the population, and the role of state programs in their regulation.

Scientific novelty of the research. As a result of identifying the problems of demographic development of the quality of life of the population of the Greater Caucasus province, the following scientific innovations have been obtained:

- the system of indicators characterizing the quality of life has been studied and it has been determined that the quality of life of the population is affected by demographic, socio-economic factors, as well as environmental factors. Analysis of factors affecting the quality of life allowed the selection of key criteria for assessing the population at the regional level;
- for the first time, 30 selected indicators of the quality of life, consisting of demographic, economic, social, and environmental factors, were indexed to the same coefficient across the administrative districts of the Greater Caucasus province, and the comparison revealed that regional differences were sharp;
- indicators affecting the quality of life of the population were evaluated and, for the first time, the Life Quality Index for the region was calculated;
- the importance of adopting new state programs to improve the living quality of the population in the Greater Caucasus province and regulate demographic processes was substantiated, and a development model was proposed to increase the regional quality of life.

Theoretical and practical significance of the research. The results and recommendations obtained in the research can be used in the development of social protection programs in various economic regions, as well as in the country, to improve the quality of life of the population, improve welfare, and regulate demographic problems.

Appropriation and application of the research. During the preparation of the dissertation, the main findings of the research were presented at the following conferences and discussed in seminars. It belongs to them, republican scientific conference on the topic "Human and environmental relations" dedicated to the 110th anniversary of the birth of academician H.A.Aliyev (Baku, 2017), republican scientific and practical conference on the topic "Land management in a market economy, achievements and modern

challenges" dedicated to the 95th anniversary of the birth of the national leader of the Azerbaijani people Heydar Aliyev (Baku, 2018), international conference on "Sustainable development goals: current status and prospects" dedicated to the 96th anniversary of the birth of the great leader Heydar Aliyev (Baku, 2019), international conference on "Human geography in Azerbaijan and Russia: main paths of development in the 21st century" (Baku, 2019), Republican conference "Modern problems of geography" dedicated to the 70th anniversary of the city of Sumgayit (Sumgayit, 2019), "International demographic forum: meeting materials" (Voronezh, 2020), international demographic forum "Demography and global challenges" (Voronezh, 2021), international conference on "Tourism and recreation in the 21st century: problems and prospects" (Baku, 2021), scientific and practical conference "Man and relief as a fundamental part of natural evolution" dedicated to the 100th anniversary of Prof. N.Sh.Shirinov (Baku, 2022), the republican scientific conference "Ecology: problems of nature and society" dedicated to the 115th anniversary of the birth of academician Hasan Aliyev (Baku, 2022), Scientific and practical conference on the topic "The development of the water sector of Azerbaijan is connected with the name of the national leader Heydar Aliyev" (Baku, 2023), Republican scientific-practical conference "Heydar Aliyev's role in the development of science and education in Azerbaijan" (Baku, 2023), Tourism and recreation: innovations and GIS technologies: materials of the XV International scientific and practical conference (Astrakhan, 2023), etc.

27 scientific articles and conference materials were published on the content of the dissertation.

The name of the organization where the dissertation work was implemented. The dissertation work was carried out at the "Medical Geography" department of the Institute of Geography named after academician Hasan Aliyev of the Ministry of Science and Education of the Republic of Azerbaijan.

The volume, structure, and primary content of the dissertation. The dissertation consists of an introduction, 3 chapters, a conclusion, and a list of references. The volume of the work is 158

pages. The work consists of 4 figures, 6 maps, 15 graphs, 5 formulas, 24 tables, and a list of 153 references. Introduction – 5 pages, chapter I – 30 pages, chapter II – 59 pages, chapter III – 46 pages, conclusion – 2 pages, references – 14 pages. It consists of 232,525 characters without tables, graphs, figures, and references.

A BRIEF SUMMARY OF THE DISSERTATION

The **introduction** provides information on the topic's actuality and level of research on the subject, its objectives and tasks, research methods, the main provisions presented for defense, scientific innovations, the object and subject of the research, its theoretical and practical significance, and its approbation and application.

The first chapter of the dissertation work is dedicated to **"The theoretical and methodological foundations of studying the demographic situation and living quality of the population"**. The concept of the living quality of the population and the importance of studying it, as well as its theoretical and methodological foundations, are presented in this chapter. It is known that there is no single defining criterion for the concept of "quality of life". In the reports of the UN, the concept of "quality of life" is explained as the amount of goods and services consumed by people during a specific time, and the degree of satisfaction of material and spiritual needs[1]. Although different opinions have been expressed on this matter over a certain period, the general theory is based on the quality of life of the population. According to Russian researchers V.M.Jerebin and A.N.Romanova, the living quality is the extent to which the population is satisfied with various needs and interests that are essential for their lifestyle[2]. The American economist J.Foster states that the quality of life depends on factors such as population density, the quality of food products, the income of the population,

[1] UNDP, Human Development Report / – New York: – 2010. – 238 p. (In Eng.)

[2] Zherebin, B.M. Standard of living of the population / B.M.Zherebin, A.N.Romanov. – Moscow, – 2002. – 592 p. (In Russ.)

environmental pollution, etc[3]. According to Azerbaijani researcher, J.B.Guliyev, quality of life means the fulfillment of people's physical, spiritual, and social needs[4]. According to Z.N. Eminov, the quality of life is the fulfillment of material and spiritual needs that encompass the quality of the population's life activities, the place where they reside, living conditions, the quality of communication services, and other indicators[5]. Thus, the concept of quality of life implies providing the population with quality services, and in this case, not only statistical figures are taken into account, but also the attitude of people themselves towards favorable living conditions, comfort, and the state of the environment in which they populate. Such an approach can vary completely from one person to another based on their worldview, outlook on life, and other characteristic traits.

In this section of the dissertation, the main criteria for selecting indicators for assessing the quality of life were also analyzed. Several international organizations prepare reports consisting of indicators that align with their interests and the existing conditions to evaluate the quality of life of the population.[6]. The understanding of this concept has varied across countries, as researchers have evaluated the development levels of the countries in question using different approaches, leading to a variety of indicators. Currently, there is no unified generalized system of indicators that characterizes the quality of life. Since 1990, the United Nations Human Development Index (HDI) has been used internationally to assess the quality of life.

The quality of life of the population is understood as the fulfillment of their material, spiritual, and social needs, depending on people's needs. These needs are closely related to the development of

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[3] Foster, J.; Greer, J.; Thorbecke, E. A Class of Decomposable Poverty Measures // Econometrica. – v. 52(3). – 1984. – pp. 761-766. (In Eng.)

[4] Guliyev, J.B. Standard of living: socio-economic factors causing and reducing poverty / J.B. Guliyev. – Baku: Europa, – 2011. – 240 p. (In Aze.)

[5] Eminov, Z.N. The current state of living quality of the population in the Republic of Azerbaijan / Z.N Eminov, S.I.Rzayeva, – Baku: Region Press, – 2022. – 240 p. (In Aze.)

[6] UN Development Program, "Human Development" teaching aid. – Baku: 2014. – 398 p. (In Aze.)

the country or region. Therefore, the criteria for assessing the quality of life vary by country. The universally accepted indicators of quality of life across all countries are as follows: population income, life expectancy at birth, infant mortality, maternal mortality, education level, healthcare availability, quality of social services, environmental quality, etc.[7] These indicators are initial estimates to be considered in the analysis of quality of life issues in the research area. Such an approach to studying quality of life takes into account not only demographic, economic, and social factors, but also ecological factors. The main factors affecting the quality of life of the population in the surrounding environment are considered. This affects the evaluation of the quality of life of the population in areas with ecological problems. However, when determining the level of development of countries, ecological factors are not taken into account and are not directly included in the calculation of HDI. Nevertheless, ecological sustainability is recognized as an important aspect of human development.

Since quality of life is the main indicator characterizing and evaluating the socio-economic development of each country, it would be appropriate to look at it in a broader context beyond health, education, and income. Currently, the main goal of social policy worldwide is to improve the quality of life of the population, ensure social welfare, and enhance the quality of services and the environment.[8]. In modern times, when studying the quality of life of the population, researchers pay special attention to the analysis of health, employment, and working conditions, educational opportunities, housing conditions, service sectors, leisure, and culture, as well as the quantity and quality aspects of the surrounding environment.

The second chapter of the dissertation is dedicated to **"Regional foundations of demographic development of the living quality of**

[7] Quality of life: facts and views. Eurostat Statistical books. – 2015, – 268 p. (In Eng.)

[8] Huseynova, T.M. An evaluation of the life quality and human development index (on the example of the Greater Caucasus province of the Republic of Azerbaijan) // – Kiev: Geography and tourism, – 2022. № 68, – pp. 29-37. (In Eng.)

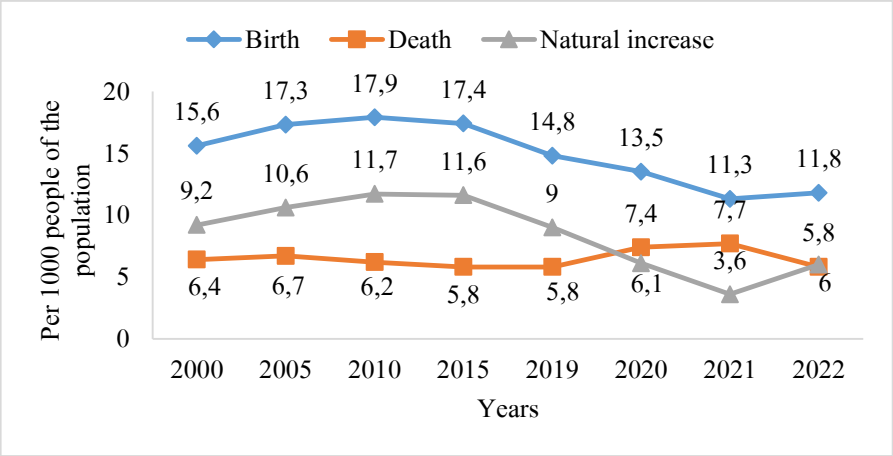
the population and factors influencing it in the Greater Caucasus province". In this chapter, the current situation and regional characteristics of indicators influencing the formation of the quality of life of the population in the Greater Caucasus province and its economic regions have been analyzed. In the modern era, the quality of life of the population is determined by indicators reflecting demographic, socio-economic, and ecological aspects. For this purpose, the demographic development characteristics of the living quality of the population were analyzed, and the factors influencing it were identified.

The Greater Caucasus province includes the economic regions of Baku, Absheron-Khizi, Shaki-Zagatala, Guba-Khachmaz, and Daghlig (Mountainous) Shirvan. The area of the province is 28.6 thousand km^2, covering 33.2% of the country's territory[9]. Demographic indicators affect various aspects of the population's quality of life. In 2022, the population in the Greater Caucasus province was 4705.2 thousand people, representing 46.5% of the country's population. From 2000 to 2022, an increase of 1328.6 thousand people, or 139.3% was observed in the province. A significant portion of the population in the Greater Caucasus province migrates to Baku, Sumgait, and Absheron. Migration, along with being one of the factors determining demographic development, also depends on quality of life indicators of the population. Most migrations occur for economic and social reasons. Reasons such as seeking better living conditions, utilizing high social-cultural service opportunities, securing high-paying jobs, obtaining education, etc., determine the quality of life of the population and are reasons for migration. Internal migration within the country significantly affects the ratio of rural and urban populations. In 2022, the urban population of the Greater Caucasus province was 3561.0 thousand people (75.7%), while the rural population was 1134.9 thousand people (24.1%).

Natural increase being the main source of population growth, increases the demand for education, health, and social services. The

[9] Geography of the Republic of Azerbaijan / ed. R.M.Mammadov. – Baku: Europe, – vol. 3: Regional Geography. – 2015. – 400 p. (In Aze.)

quality of these services directly impacts the quality of life of the population. Various trends have occurred during the period analyzed in the Greater Caucasus province (Graph 1).



Source: The graph was compiled by the author based on data from "Demographic Indicators of Azerbaijan".

Graph 1. Birth, death, natural increase indicators in the Greater Caucasus province

After 2019, a decrease in birth and natural increase, as well as a sharp increase in death rates, have been observed, which is attributed to the serious impact of the COVID-19 pandemic on our country. In the province, the natural increase per 1000 people decreased by 40% in 2020-2021, from 9 to 3.6, while births decreased by 23.6% from 14.8 to 11.3. Deaths, on the other hand, increased by 32.8%, rising from 5.8 to 7.7. After 2022, births and natural increase have increased, while death rates have decreased again.

The assessment of mortality as one of the key indicators for determining the quality of life of the population is dependent on the socioeconomic development level of regions, whether the population

lives in urban or rural areas, and the quality of life[10]. During the analysis of mortality rates by age groups, high infant mortality rates stand out. In the Greater Caucasus province in 2000, 623 infant deaths were recorded, with 18.9 infant deaths per 1000 live births (18.2 in cities, 16.9 in rural areas). In 2022, the number decreased to 405, with 8.8 infant deaths per 1000 live births (10.6 in cities, 7.6 in rural areas)[11]. Despite the high number of hospitals and quality medical services in cities, infant mortality rates are high. Infant mortality depends on the level of medical care provided to mothers and children, their nutrition, and the lack of medical examinations for women during pregnancy. These issues also affect maternal mortality. The causes of maternal mortality can be attributed to women's health, occupation, lifestyle, and other factors.

In recent years, the decrease in birth and natural growth rates is attributed to families diverging from the principle of having many children and women prioritizing work over social needs. These processes affecting natural growth indicate an increase in the proportion of the elderly population with a decrease in births. To analyze the above more precisely, we divided the population in the Greater Caucasus region by age groups and analyzed the total population by dividing it into groups of 0-14 and over 50 years old (Table 1).

The share of the population aged 0-14 was 30.1% in 1999, and 22.4% in 2009, while the share of the population aged 50 and above was 14.8% and 21.5%, respectively. This means that the population was of a progressive type during that period. In the years 2009-2019, the ratio of the population aged 0-14 was 21.4%, while the ratio of the population aged 50 and above increased to 26.5%, transitioning the population to a regressive type. This indicates that in recent years, the aging process of the population in the Greater Caucasus province has been progressing.

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[10] Eminov, Z.N. The current state of living quality of the population in the Republic of Azerbaijan / Z.N Eminov, S.I.Rzayeva, – Baku: Region Press, – 2022. – 240 p. (In Aze.)

[11] Demographic indicators of Azerbaijan – 2022 / Statistical collection, – Baku: SSC, – 2023. – 593 p. (In Aze.)

Table 1

The age structure of the population in the Greater Caucasus province

Indicator		1999	2009	2019	Fluctuation
A thousand people	Total population	3376,6	3896,0	4339,5	+962,9
	Population aged 0-14	1015,6	871,8	929,1	-86,5
	Population aged 50 and over	498,4	838,1	1149,2	+650,8
Percentage	Share of population aged 0-14 in the total population	30,1	22,4	21,4	-8,7 %
	Share of the population aged 50 and over in the total population	14,8	21,5	26,5	+11,7%

Source: The table was compiled based on the materials of the population census in the Republic of Azerbaijan - 1999 Volume I, 2009 Volume I, and 2019 Volume I.

The indicator of the burden calculated for every 100 people of working age is widely used for evaluating the age structure. In the province, over the past 20 years, the overall demographic burden ratio has decreased by 1.4 times, the dependency ratio of children has decreased by 1.6 times, and the dependency ratio of the elderly has increased by 1.2 times. This, in turn, has led to an increase in the aging index. Aging refers to the share of the population aged 65 years and older among the total population, while the aging index is the ratio of the share of the elderly population to the share of the population aged 14 years and under[12]. The index for the Greater Caucasus province was 18.6 in 1999, and it increased by 1.9 times to reach 34.6 in 2019.

The increase in the elderly population is closely related to the decrease in natural growth and the extension of life expectancy. Life expectancy is considered an important indicator for assessing the quality of life of the population, reflecting the health status of the population, the quality of medical services, food safety, and socio-

[12] Novoselova, S.V. Fundamentals of demography. Allowance for state employees / C.B.Novoselova, M.B.Denisenko. Under the general editorship of Lapina S.V. – Minsk: Altiora - Living Colors. – 2012. – 138 p. (In Russ.)

economic conditions. In the Greater Caucasus province, life expectancy at birth increased by 1.3 years from 2015 to 2022, reaching 75.9 years (Table 2).

Table 2

Average life expectancy at birth in economic regions

Economic regions	2015		2020		2022	
	Qadın	Kişi	Qadın	Kişi	Qadın	Kişi
Baku	77,4	72,6	76,7	71,0	79,3	74,6
Absheron-Khizi	78,4	72,5	77,0	69,6	79,4	74,7
Shaki-Zagatala	76,6	71,9	76,7	70,1	77,7	73,6
Guba-Khachmaz	76,3	71,1	76,3	67,0	78,2	72,7
Daghlig (Mountainous) Shirvan	77,6	72,1	76,3	68,6	77,3	71,8
Province	77,3	72,0	76,6	68,8	78,4	73,5
Country	77,6	72,7	76,5	70,1	78,4	73,6

Source: The table was compiled based on statistical materials "Women and Men in Azerbaijan".

Analyses by economic regions show that the average life expectancy of women is higher than that of men. This is a widely spread trend worldwide. The average life expectancy for women ranges from 76-79 years, while for men it ranges from 71-75 years[13]. The difference in expected life expectancy is related to the lifestyle of the population, as well as the quality of social, economic, and medical services.

The solution to the demographic problems of the regions determines the goal of social and economic development - improving the quality of life of the population. The long-standing leading position of the oil and gas industry in the country, along with the large volumes of local and foreign investments allocated to these sectors, has led to an imbalance in the territorial organization and sectoral structure of the economy. In addressing social and economic issues in the regions, the territorial principles should be taken into

[13] Women and men in Azerbaijan – 2022 / Statistical collection, – Baku: SSC, – 2023. – 257 p. (In Aze.)

account in the placement of the economy, which is considered a strong tool. This is because the placement of the economy facilitates the efficient use of the area's natural and human resources, encourages the involvement of local raw materials and materials in production, and ensures the equal and proportional distribution of the population across the country's territory by creating new business opportunities[14]. The main part of the country's economic, socio-cultural, and demographic potential is concentrated in the city of Baku. In 2022, 81.0% of the country's product output, 93.8% of industrial products, 26.0% of agricultural products, 71.5% of retail trade, 62.4% of investments directed to fixed capital, 66.6% of wage earners, and 72.2% of the population's income fell to the share of the research area. Regional analysis shows that 72.3% of the total product output in the country and 89.2% in the province belong to the city of Baku. This means that the share of other economic regions in the total product output is only 1-2%[15]. There are also sharp differences in the employment structure between the city of Baku and other economic regions (Fig. 1).

In 2022, the number of employed population in the Greater Caucasus province was 2,309.6 thousand people, accounting for 47.8% of the country. In that year, 51.2% of the employed population in the region worked in Baku city, 16.8% in the Absheron-Khizi region, 14.6% in the Shaki-Zagatala region, 10.8% in the Guba-Khachmaz region, and 6.6% in the Daghlig (Mountainous) Shirvan economic region. A significant portion of the employment sector in the Greater Caucasus province was attributed to agriculture (22.4%) and the service sector (31.1%)[16].

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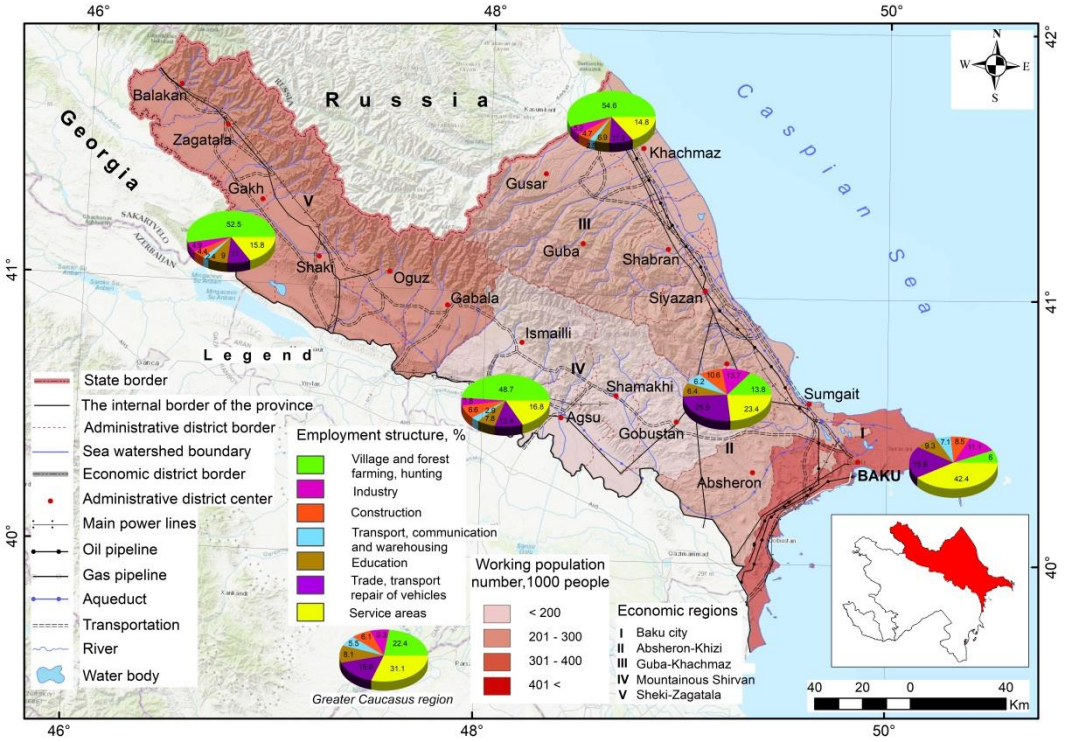
[14] Imrani, Z.T. Regional aspects of sustainable development policy in Azerbaijan // Republican scientific and practical conference on "Geographical problems of Azerbaijani regions", – Baku: – 2016. – pp. 101-104. (In Aze.)

[15] Huseynova, T.M. Socio-economic factors affecting the quality of life of the population (on the example of the Greater Caucasus province of the Republic of Azerbaijan) // – Türkiye: Academic Journal of History and Thought, – 2024. №11(2), – pp. 880-889. (In Aze.)

[16] Eminov Z.N., Huseynova T.M. Solving the employment problem in improving the quality of life of the population of the Greater Caucasus province // – Baku: Geography and Natural Resources, – 2023. №1(19), – pp. 67-74. (In Aze.)



Source: Compiled by the applicant using ArcGIS software based on data from the State Statistical Committee.

Fig. 1. Map of the employment structure of the population in the Greater Caucasus province, 2020

Improving the quality of life is one of the main goals of every country's social policy. The healthcare system, as an important area of social services, plays a key role in protecting the health of the population. In 2022, the number of doctors per 10,000 people in the Greater Caucasus province was 30.8, the average number of medical staff was 50.6, the number of hospital beds was 33.5, and the capacity of outpatient clinics was 97.6[17]. Statistical analyses show that health indicators have declined over the past 22 years. Although modern equipment is available in Baku, problems such as the use of outdated equipment in other regions, staff shortages, and insufficient hospital bed availability still exist. These issues negatively affect the quality of medical services provided to the population.

One of the important factors affecting the sustainability of socio-economic development is the protection of the environment. One of the main causes of climate change and a key factor that indirectly affects the quality of life is atmospheric pollution. Pollution disrupts the transparency of the atmosphere and the concentration of gases, posing a threat to climate change and public health[18]. From 2000 to 2022, a total of 2,880 thousand tons of pollutants were released into the atmosphere in the region, of which 2,726 thousand tons are attributed to the city of Baku. In 2022, 88.6% of the pollutants released into the atmosphere were related to the city of Baku, while other economic regions emitted between 0.1 to 3.7 thousand tons of pollutants[19]. It is necessary to continue regional and international cooperation to reduce harmful substances.

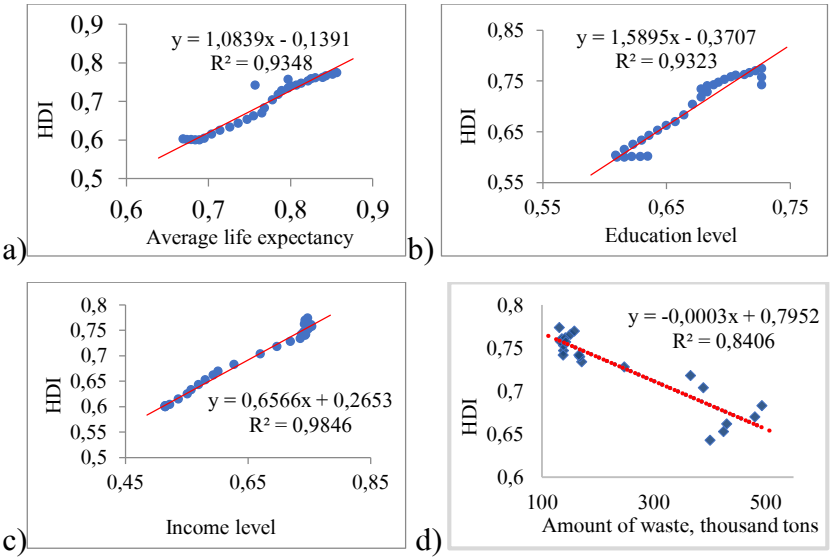
The third chapter of the dissertation is dedicated to **"The main demographic problems affecting the living quality of the population and the role of State Programs in their regulation in the Greater Caucasus province".** In this chapter, the

[17] Regions of Azerbaijan-2022 / Statistical collection, – Baku: – 2023. – 865 p. (In Aze.)

[18] Rzayeva, S.I. Modern ecological state of atmospheric air in the cities of Baku and Sumgait and its impact on population health // – Baku: Works of the Azerbaijan Geographical Society, v. 17, – 2012. – pp. 512-516. (In Aze.)

[19] Environment in Azerbaijan / Statistical Bulletin, – Baku: SSC, – 2023. – 136 p. (In Aze.)

interrelationship of indicators affecting the quality of life were analyzed.



Source: Graphs compiled by the author based on data from the Global Data Laboratory [20].

Graph 2. Dependence of the HDI on life expectancy (a), education (b), income (c) and environmental quality (d)

Since the indicators that shape the quality of life are directed toward the development of the human factor, it is important to evaluate the Human Development Index (HDI) in the province. In the Greater Caucasus province, the HDI was 0.602 in 1992, and it increased by 25.7% to 0.773 between 1992 and 2022. The interdependence of the HDI with life expectancy, education, and income levels has been analyzed[21]. It has been determined that the values of the correlation coefficient are 0.967, 0.965, and 0.992,

[20] Global Data Lab.: [Electronic resource] / Nijmegen Center for Economics. – Nijmegen. URL: https://globaldatalab.org/shdi/table/shdi/AZE/? (In Eng.)

[21] Huseynova, T.M. Influence of the environment on human health and quality of life (on the example of the Greater Caucasus of the Republic of Azerbaijan) // – Almaty: Geography and water resources, – 2024. №1, – pp. 32-40. (In Eng.)

respectively. The coefficient of determination (R^2) is equal to 0.935, 0.932, and 0.985, respectively. The density between them is determined to be 94%, 93%, and 99%, indicating that the level of income of the HDI is more dependent on them (Graph 2: a, b, c).

Pollutants negatively affect the environment, reducing the quality of life for the population. The relationship between the amount of pollutants released into the atmosphere and the Quality of Life Index (QLI) has been analyzed (see graph 2, d). The value of the correlation coefficient (r=-0.939) indicates that in years with lower levels of pollutants, the QLI has been higher. The coefficient of determination is 0.840, meaning that the dependency is 84%. Therefore, in this research, the quality of life of the population has been evaluated alongside demographic, economic, social, and ecological factors, and for the first time, the indicators have been indexed for comparative analysis.

To obtain the index, the maximum (x_{max}), minimum (x_{min}), and actual values (x_i) of the given indicator are taken. To convert any x indicator into an index, the following formulas are used[22]:

$$I=\frac{X_i-X_{min}}{X_{max}-X_{min}} \quad \text{or} \quad I=\frac{X_{max}-X_i}{X_{max}-X_{min}} \qquad (1)$$

Formulas are intended for the calculation of positive and negative indicators, and standardized indicators are within the range of (0,1). The main purpose of indexing is to compare regions by bringing the indicators to the same coefficient. During the analysis, it has been determined that the specific weights of the indices are variable. This depends on factors such as the area of the regions, the level of socioeconomic development, the population size, etc. In the research work, the author has proposed the Quality of Life Index (QLI) to assess the quality of life of the population. The QLI is calculated as the geometric mean of 4 indices.

$$QLI=\sqrt[4]{I_d \times I_e \times I_s \times I_{eco}} \qquad (2)$$

[22] UNDP, Human Development Report / – New York: – 2020, – p. 412. (In Eng.)

here,
QLI – quality of life index,
I_d – demographic index,
I_e – economic indicators index,
I_s – social indicators index,
I_{eco} – is an index of environmental indicators.

Regions differ completely in terms of the level of socio-economic development and the quality of the environment. Therefore, it is more appropriate to calculate ecological and socio-economic indicators separately to assess the impact of both aspects more accurately. To emphasize the importance of ecological indicators in the development level of the area, the method of calculating the HDI by E.V.Ryumina has been used[23]. Thus, the Quality of Life Index (QLI) for demographic, economic, and social indicators, as well as the Quality of Life Index considering ecological indicators (QLI_{eco}), has been proposed as follows:

$$QLI = \sqrt[3]{I_d \times I_e \times I_s} \quad (3)$$

$$QLI_{eco} = 1/4(3 \times QLI + I_{eco}) \quad (4)$$

Indicators are grouped as weak (0.100-0.399), average (0.400-0.599), high (0.600-0.899), and very high (0.900-1.00).

The Living Quality Index coefficients have been calculated based on the proposed 3rd and 4th formulas to assess the quality of life of the population (table 3). The QLI varies between 0.185 and 0.676 across the 18 administrative districts of the Greater Caucasus province. The city of Baku has not been compared with the other administrative districts of the region in terms of development level. The city of Sumgayit is at a high level, while the administrative districts of Absheron, Ismayilli, Balakan, Gakh, Gabala, and Shaki are at an average level. The administrative districts of Khizi, Aghsu, Gobustan, Shamakhi, Khachmaz, Guba, Gusar, Siyazan, Shabran,

[23] Ryumina, E. V. Environmental aspects of assessing the quality of life // Economy of the region, – 2016. – Vol. 12, issue 4, – P. 1113–1122. (In Russ.)

Oghuz, and Zagatala are at a weak level. There are no administrative districts at a very high level. In terms of demographic and ecological indices, Absheron ranks first, in terms of economic index, Sumgayit city ranks first, and in terms of social index, Gakh district ranks first.

In the comparison of the economic regions of the Greater Caucasus province, Baku city ranks first in the QLI ranking, while the Mountainous Shirvan economic region is in last place. According to the grouping, Baku city is at a high level, the Absheron-Khizi and Shaki-Zagatala regions are at an average level, while the Guba-Khachmaz and Daghlig (Mountainous) Shirvan economic regions are at a weak level (Fig. 2).

Table 3

Indexing the quality of life of administrative districts included in the Greater Caucasus province

№	Administrative districts	Demographic Index, $İ_d$	Economic Index, $İ_e$	Social Index, $İ_s$	Environmental Index, $İ_{eko}$	Quality Life Index, QLI	QLI_{eco}
1	Sumgait	0,530	0,754	0,773	0,352	0,676	0,595
2	Absheron	0,537	0,406	0,707	0,898	0,536	0,627
3	Khizi	0,491	0,136	0,321	0,843	0,278	0,419
4	Aghsu	0,452	0,331	0,174	0,520	0,297	0,353
5	Ismayilli	0,458	0,477	0,431	0,565	0,454	0,481
6	Gobustan	0,452	0,119	0,119	0,545	0,185	0,275
7	Shamakhi	0,452	0,499	0,180	0,541	0,351	0,399
8	Khachmaz	0,460	0,743	0,089	0,505	0,314	0,362
9	Guba	0,485	0,591	0,170	0,508	0,365	0,401
10	Gusar	0,524	0,395	0,268	0,549	0,381	0,423
11	Siyazan	0,506	0,308	0,362	0,707	0,384	0,465
12	Shabran	0,446	0,133	0,237	0,605	0,241	0,332
13	Balakan	0,503	0,474	0,301	0,504	0,415	0,437
14	Gakh	0,455	0,399	0,653	0,576	0,491	0,512
15	Gabala	0,472	0,329	0,553	0,576	0,444	0,442
16	Oghuz	0,536	0,296	0,401	0,626	0,397	0,489
17	Shaki	0,479	0,506	0,389	0,541	0,455	0,476
18	Zagatala	0,503	0,207	0,408	0,546	0,349	0,398

Source: The table was calculated using formulas proposed by the author based on data from the State Statistical Committee of the Republic of Azerbaijan[24].

[24] Regions of Azerbaijan – 2022 / Statistical collection, – Baku: State Statistical Committee, – 2023. – 865 p. (In Aze.)

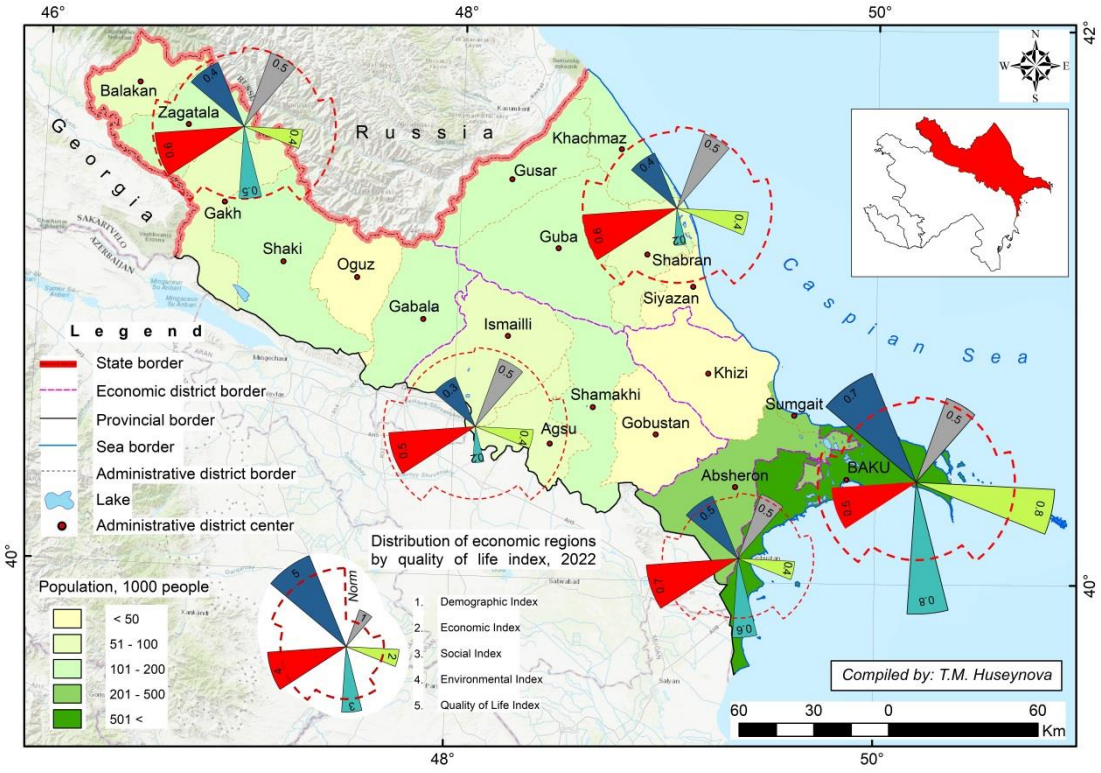


Fig. 2. Distribution map of the economic regions of the Greater Caucasus province by quality of life index

In this chapter of the dissertation, priority has also been given to solving demographic, socioeconomic, and ecological problems to improve the quality of life of the population. It has been determined that addressing the employment problem is one of the most important indicators for enhancing the quality of life. Since the early years of independence, social and economic challenges have been addressed to improve the quality of life of the population and to enhance the quality of services provided to them. Starting from the end of the 20th century, social and economic reforms have been initiated. Various models have been proposed in world practice to comprehensively assess the quality of life, living standards, material conditions of the population, and the socioeconomic aspects of societal development[25]. Considering the socioeconomic, ecological, and demographic conditions of the Greater Caucasus province, there is a need to establish development models for improving the settlement of the population in its economic and administrative districts and enhancing demographic potential. Based on research conducted in foreign countries, a regional quality of life model has been developed to improve the living standards of the population in the Greater Caucasus province and to achieve sustainable development of the regions (Fig. 3).

The preparation of this model takes into account the demographic, social, economic, ecological, and management situation of the region. To achieve demographic development, it is essential to create conditions that can ensure a birth rate in the region, reduce the death rate, improve the health and well-being of the population to extend life expectancy and regulate migration processes. The quality of life of the population is a complex and multifaceted concept that encompasses the demographic, economic, social, and ecological situation of society. Additionally, a key priority for the sustainable development of the region is to strengthen the health of the population, ensure quality education, and provide for demographic development.

[25] Zhalnina, A.V. Economic analysis of the quality of life: monograph / A.V. Zhalnina, B.I. Gerasimov. - Tambov: ITGTU, - 2006. - 144 p. (In Russ.)

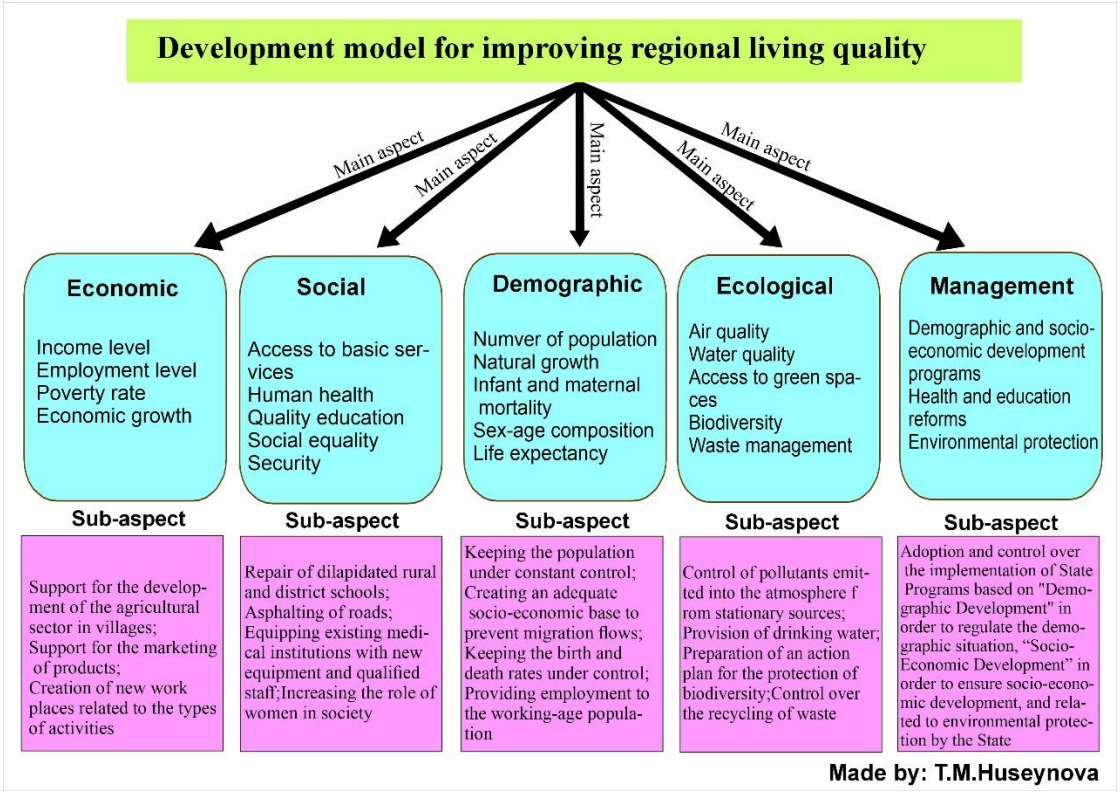


Fig. 3. Development model for improving regional quality of life

This chapter also analyzes the role of state programs in improving the quality of life. To extend the average life expectancy of the population, it is essential to conduct regular and periodic medical examinations, strengthen the material and technical base of healthcare facilities, and develop the sanatorium and rehabilitation network. These aspects are significant factors in demographic development and have a substantial impact on raising the living standards of the population. Therefore, a plan of action in this direction should be continuously developed and implemented consistently. In the country, including in the regions, it is important to enhance demographic development, raise the living standards of the population, increase social and economic support, and regulate migrations. For this reason, the development of various demographic programs tailored to the regions is considered effective.

CONCLUSIONS

1. During the study of demographic factors affecting the quality of life of the population, it becomes clear that during the analyzed period, trends in the population size, birth, death, natural increase, gender-age composition, and changes in life expectancy were observed in the Greater Caucasus province. The total population increased by 39.3%, the urban population by 44.0%, and the rural population by 25.5%. Births, natural increase, and marriages decreased by 1.5 times, while the number of divorces increased by 1.4 times. The population aged 0-14 decreased by 8.7%, while the population aged 50 and above increased by 11.7%. The dependency ratio for children decreased by 1.6 times, while the dependency ratio for the elderly increased by 1.2 times. This has led to a 1.9 times increase in the aging index [4; 10; 13; 14; 16; 23].

2. During the analysis of the socioeconomic factors affecting the quality of life of the population, sharp regional disparities have been observed. There is a difference of 2-3 times in the per capita social and economic indicators between the city of Baku and other regions of the province. The concentration of economic, social, cultural, and demographic potential in small areas creates problems

in providing social services to the population and also leads to pollution of surrounding areas, water bodies, and the atmosphere, as well as an increase in household waste. The impact on public health also reduces the quality of life [9; 17; 22; 26].

3. In the Greater Caucasus province, a positive correlation has been observed between the Human Development Index and life expectancy, education level, and population income (with respective values of r=0.967, r=0.965, and r=0.992), while a negative correlation has been noted with the amount of pollutants released into the atmosphere (r=-0.939). It has been determined that the environmental factor affects human development [18; 25].

4. The indicators affecting the quality of life of the population have been indexed, and the existence of regional differences has emerged during their interrelations. There is a positive correlation between the quality of life index and demographic, economic, and social indices (r=0.576, r=0.706, r=0.860, respectively). However, the correlation between the ecological and economic indices is weak, and the linear relationship is negative (r=-0,517).

5. The Life Quality Index for the administrative districts included in the Greater Caucasus province has been calculated and categorized into very high, high, medium, and low ratings. The average index value is 0.390. Eight administrative districts scored above the average, while ten administrative districts scored below it. The city of Sumgayit is rated high, the administrative districts of Absheron, Ismayilli, Balakan, Gakh, Gabala, and Shaki are rated medium, and the administrative districts of Khizi, Aghsu, Gobustan, Shamakhi, Khachmaz, Guba, Gusar, Siyazan, Shabran, Oghuz, and Zagatala are rated low. There are no administrative districts rated very high.

6. During the analysis of the development model for improving the quality of life in the province, it has been revealed that in order to prevent the influx of the population to cities, it is essential to develop the agricultural sector in rural areas, provide high-quality social, cultural, and household services to the population, education and vocational training for the local workforce in various sectors, the creation of job opportunities suitable for modern professions and

specialties, and the elimination of wage disparities, enhance state care for mothers and children, improve housing conditions, and enhance environmental quality. As a result, it is crucial to ensure the retention of demographic potential in rural areas [20; 21; 23; 24].

SUGGESTIONS

1. The implementation of a new demographic policy is necessary to accurately determine the regularities of changes occurring in demographic processes and the quantitative and qualitative indicators of the socioeconomic factors influencing these processes. The new demographic policy will be an important tool for adapting to the dynamics of society, improving the quality of life of the population, and ensuring sustainable development.

2. By bringing together social, economic, demographic, and ecological indicators through the proposed index, it can be used to more accurately assess the quality of life of the population, identify problems, conduct a comparative analysis to shape the competitive environment, and determine the priority directions for future socioeconomic development.

Published scientific works on the topic of the dissertation

1. Huseynova, T.M. Main directions of development of social sphere in Sheki-Zagatala economic region // Republican scientific conference on “Demographic development in the Republic of Azerbaijan: prospects of population settlement and regional problems”. – Baku: Europe, – September 12-13, – 2016, – pp. 387-393.
2. Huseynova, T.M. Development features of natural population growth in the Sheki-Zagatala economic region // Proceedings of the Azerbaijan Geographical Society. Republican scientific conference on the topic “Human and environmental relations” dedicated to the 110th anniversary of the birth of Acad. H.A. Aliyev, – Baku: Europe, – June 16, – 2017. v. 20. – pp. 409-411.

3. Huseynova, T.M. Ways of efficient use of land resources of the southeastern slope of the Greater Caucasus // Republican scientific and practical conference on “Land management in a market economy, achievements and modern challenges” dedicated to the 95th anniversary of the birth of the national leader of the Azerbaijani people Heydar Aliyev, -Baku: Europe, - May 7, - 2018, - pp. 233-240 (Co-author: Huseynov C.S.).
4. Huseynova, T.M. Demographic development features of the Guba-Khachmaz economic region // – Baku: Works of the Azerbaijan Geographical Society, Geography and natural resources, – 2019. No. 1 (9), – pp. 55-60.
5. Huseynova, T.M. Territorial organization and development of social service areas in the Nagorno-Shirvan economic region // International scientific and practical conference “Sustainable development goals: current status and prospects” dedicated to the 96th anniversary of the birth of the great leader Heydar Aliyev, – Baku: ASOIU, – April 26, – 2019, – pp. 294-296.
6. Huseynova, T.M. The role of natural and climatic factors in the development of tourism in the Greater Caucasus province // International scientific conference on the topic “The role of tourism in ensuring sustainable development” dedicated to the 100th anniversary of Baku State University, – Baku: BSU, – May 29-30, – 2019, – pp. 415-420 (Co-author: Huseynov C.S.).
7. Huseynova, T.M. Development directions of social service sectors in the Guba-Khachmaz economic region // International scientific conference on “Human geography in Azerbaijan and Russia: main paths of development in the 21st century”, – Baku: Europe, – May 10-14, – 2019, – pp. 50-58.
8. Huseynova, T.M. Social foundations of the formation of the quality of life in the Upper Shirvan economic region // Republican scientific conference on the topic “Modern problems of geography” dedicated to the 70th anniversary of the city of Sumgayit, – Sumgayit, – October 24-25, – 2019, – pp. 199-203.

9. Huseynova, T.M. Social foundations of the formation of the quality of life of the population in the Greater Caucasus province // – Nakhchivan: Scientific Works of the Nakhchivan branch of ANAS, – 2020. No. 2, – pp. 286-290.
10. Huseynova, T.M. The role of the demographic factor in shaping the quality of life in the Republic of Azerbaijan, using the example of the Greater Caucasus natural region // International demographic forum: meeting materials, - Voronezh: Digital printing, - October 22-24, - 2020. - pp. 177-181.
11. Huseynova, T.M. Social foundations of the formation of the quality of life of the population in the Absheron economic-geographical region // – Baku: Works of the Azerbaijan Geographical Society, Geography and natural resources, – 2021. No. 1(13), – pp. 87-93.
12. Huseynova, T.M. The role of tourism in improving the quality of life of the population in the Greater Caucasus province // V International scientific and practical conference on "Tourism and Recreation in the XXI Century: Problems and Prospects", – Baku: – November 5, – 2021, – pp. 171-175.
13. Huseynova, T.M. Demographic development characteristics of the population of the Greater Caucasus natural region // – Baku: Scientific Works of the Azerbaijan Technical University, – 2021. No. 1, – pp. 222-227.
14. Huseynova, T.M. The influence of demographic indicators on the quality of life of the population in the Republic of Azerbaijan, on the example of the Greater Caucasus Natural Region // International demographic forum Demography and global challenges. - Voronezh: Digital printing, - September 30 - October 2, - 2021, - pp. 485-490.
15. Huseynova, T.M. The impact of demographic development on life quality of the population in the Greater Caucasus province // – Baku: Scientific and practical journal "Young researcher". – 2021. No. 2(7). – pp. 139-147.

16. Huseynova, T.M. Development characteristics of natural population growth in the Greater Caucasus province // Scientific and practical conference on “Organization and management of natural-economic systems in the Karabakh and East Zangezur economic regions”, – Baku: – April 26, – 2022, – pp. 181-191.
17. Huseynova, T.M. Problems of the impact of the ecological situation on the quality of life of the population in the Greater Caucasus province // Scientific and practical conference on the topic “Man and relief as a main part of natural evolution” dedicated to the 100th anniversary of prof. N.Sh. Shirinov, – Baku: – January 25, – 2022, – pp. 185-195.
18. Huseynova, T.M. An evaluation of the life quality and human development index (on the example of the Greater Caucasus province of the Republic of Azerbaijan) // – Kyiv: Geography and tourism, – 2022. № 68, – pp. 29-37.
19. Huseynova, T.M. The impact of water use on the quality of life of the population in the Sheki-Zagatala economic region // Scientific and practical conference on the topic “The development of the water sector of Azerbaijan is connected with the name of the national leader Heydar Aliyev”, – Baku: Mutarcim, – May 5, – 2023, – pp. 109-113.
20. Huseynova, T.M. The role of providing the population with jobs in the Greater Caucasus province in improving the quality of life // Republican scientific and practical conference on the topic “Heydar Aliyev’s role in the development of science and education in Azerbaijan”, – Baku: – May 10, – 2023, – pp. 151-155.
21. Huseynova, T.M. A role of the tourism sector in improving employment of the population in the Greater Caucasus province of the Republic of Azerbaijan // Tourism and recreation: innovations and GIS technologies: materials of the XV International scientific and practical conference, – Astrakhan, – May 26-27, – 2023, – pp. 51-54.

22. Huseynova, T.M. The impact of the water problem on the quality of life of the population in the Greater Caucasus province // – Baku: Water problems: Science and technologies, – 2023. №1(21), – pp. 84-93.
23. Huseynova, T.M. Analysis of quantitative indicators of the quality of life of the population of the Republic of Azerbaijan (in the example of the Greater Caucasus natural region) // - St. Petersburg: East European Scientific Journal, - 2023. No. 12 (97). - pp. 4-10.
24. Huseynova, T.M. Solving the employment problem in improving the quality of life of the population of the Greater Caucasus province // – Baku: Works of the Azerbaijan Geographical Society, Geography and natural resources, – 2023. №1(19), – pp. 67-74 (Co-author: Eminov Z.N.)
25. Huseynova, T.M. Influence of the environment on human health and quality of life (on the example of the Greater Caucasus of the Republic of Azerbaijan) // – Almaty: Geography and water resources, – 2024. №1, – pp. 32-40.
26. Huseynova, T.M. Socio-economic factors affecting the quality of life of the population (on the example of the Greater Caucasus region of the Republic of Azerbaijan) // – Turkey: Academic Journal of History and Thought, – 2024. №11(2), – pp. 880-889.
27. Huseynova, T.M. Population reproduction as an indicator of quality of life (on the example of the Greater Caucasus province of the Azerbaijan Republic) // - Astana: Bulletin of the L.N. Gumilyov Eurasian National University. Series Chemistry. Geography. Ecology, - 2024. No. 3 (148), - pp. 80-92.

The defense of the dissertation work will be held on 07 February 2025, at 14^{00} at the meeting of the BFD 3.14 Disposable dissertation council of the Supreme Attestation Commission under the President of the Republic of Azerbaijan operating at the Institute of Geography named after Hasan Aliyev, Ministry of Science and Education of the Republic of Azerbaijan.

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The dissertation is accessible at the library of the Institute of Geography named after Acad. Hasan Aliyev, Ministry of Science and Education of the Republic of Azerbaijan

Electronic versions of the dissertation work and its abstract are available on the official website https://www.igaz.az/az.

The abstract was sent to the required addresses on 06 January 2025.

Signed for print: 25.12. 2024

Paper format: A5

Volume: 36356

Number of hard copies: 20