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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

**THE SOCIO-DEMOGRAPHIC DEVELOPMENT AND
REGULATION OF RURAL SETTLEMENT IN THE ARAN
ECONOMIC REGION**

Speciality: 5401.01 - Economic geography

Field of science: Geography

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GENERAL CHARACTERISTIC OF THE WORK

Relevance of the topic and degree of elaboration: Villages hold significant importance in the settlement of the population and play a key role in the territorial organization of agriculture, in the production of agricultural goods, and in ensuring food security. Over the years, a high natural increase in the rural population positively impacted its growth and also contributed to the increase of the urban population through migration.

Within the framework of implemented socio-economic reforms, the construction of production and service facilities, the creation of new jobs, and efforts in the field of demographic policy have led to progress in addressing existing problems in villages. However, a significant portion of these issues still remains unresolved. Firstly, natural population growth among rural inhabitants is occurring at an increasingly slower rate, and migration from rural areas continues.

Challenges in the development of agriculture, which forms the economic base of villages, persist. The complete shift in the direction of agricultural specialization in regions and the reduced role of cotton farming—an important sector for rural employment and income—have led to a decline in the standard of living in rural areas.

The performance of local self-government bodies, such as municipalities, in villages is also weak. Their limited financial capabilities and, in many cases, the inability to fulfill the powers stipulated by the law present challenges in solving the economic, social, and cultural problems of villages.

Given this situation, the study of villages presents an important task. Investigating and regulating the increase in the rural population, and its formation through birth, death, natural increase, and migration, and establishing the scientific-theoretical foundations is of significant importance. From this perspective, the recent challenges emerging in the Aran economic region, which holds a significant place in the country's settlement system, have caused issues not only in large villages but also in the development of settlements, small, and medium-sized towns. Therefore, studying rural settlements in the region holds significant scientific and practical importance.

Over the years, significant research has been conducted in Azerbaijan in the field of population studies. These studies have examined the natural-geographical conditions, economic-geographical potential, demographic development characteristics, and the dynamics of indicators determining the formation of settlements, including rural settlements. During the years of independence, efforts in the study of settlement patterns and demographic development in the country have been further expanded.

The low level of social and cultural services provided to the rural population and the employment-related challenges further intensify migration. Therefore, identifying ways to address these issues and conducting scientific research in this field remain highly relevant.

At the same time, studying the recent changes in settlement patterns and demographic development in the regions has become an important task.

Object and subject of the research: The research object of the dissertation is the rural settlement and socio-demographic problems of the rural population in the Aran economic region, which encompasses the central and eastern parts of Azerbaijan. The economic region covers an area of 21,150 km² and has a population of 2,032,600 (as of January 1, 2024)¹. Aran encompasses 24.5% of the country's territory and accounts for 20.0% of the population. 1,280,400, or 63.0% of the total population in the economic region, live in villages. The Aran economic region comprises 16 administrative districts and the cities of Mingachevir, Shirvan, and Yevlakh. In these administrative areas, there are 18 cities, 39 towns, and 790 village settlements².

The subject of the research is the regulation of rural settlement in the Aran economic region, the socio-demographic development problems of the villages, and the identification of directions for their solutions and sustainable development paths.

Research objectives and tasks: The purpose of the research is to conduct a scientific and theoretical study of the social and

¹ Demographic indicators of Azerbaijan – 2023. – Baku, – SSC, – 2024, – p. 95-97.

² Demographic indicators of Azerbaijan – 2023. – Baku, – SSC, – 2024, – p. 72.

demographic development problems of the villages in the Aran economic region and to develop proposals for their resolution.

To achieve this purpose, the following tasks have been set:

- Justify the need for ongoing research in this area, taking into account the importance of villages and rural settlement in the country;
- Justify the necessity of planning efforts considering the historical-geographical development characteristics of villages, emphasizing the importance of accounting for the terrain, water resources, and efficient use of land reserves in the areas where they are located.
- Justify the importance of creating an economic base for the development of villages and the preservation of their demographic potential, highlighting the significant role of agriculture and the processing of its products.
- Determine the role of social-cultural service facilities in ensuring the demographic development of villages, highlight the importance of work in this field, and investigate existing problems and their solutions.
- Investigate the current state of indicators determining the demographic development of the rural population, the trends of development, and the factors affecting them, and suggest ways of regulation.
- Identify ways to ensure employment of the rural population, and study directions for improving and enhancing its structure.
- Determine the trends of rural settlement development the grouping of villages, the changes occurring, and ways of regulation.

Methods of the research: The dissertation utilizes the works of Azerbaijani and foreign scholars on population geography, demography, and the use of labor resources, as well as the scientific and theoretical propositions advanced in these studies.

During the research process, the theoretical and methodological framework was supported by the analysis of laws and decisions adopted by the country's Supreme Legislative Body, the President, and the Government, as well as the provisions outlined in State Programs and data related to the country's socio-economic and demographic development.

In the research, methods such as statistical analysis, comparison, mapping, historical-geographical and systematic approaches, and others were used.

The main provisions of the defense:

1. The impact of the natural-geographical and socio-economic potential on the formation of rural settlements in the Aran economic region, and the main directions for their efficient utilization.

2. The effects of agrarian reforms carried out during the years of independence on the development of agriculture, the economic foundation of villages, employment, income generation, and living standards of the population.

3. The main trends in the settlement of the rural population and demographic development of villages in the Aran economic region, and their regulation.

4. The effective territorial organization of social and cultural services provided to the rural population and the elimination of shortcomings in this area.

- **Scientific novelty of the research.** The scientific novelty of the research conducted in the dissertation include:

- The demographic development characteristics of villages and the trends in the development of rural settlement in the Aran economic region have been studied.

- It has been determined that the setbacks in the demographic development of the economic region during the independence years have been overcome. While birth, death, natural growth rates, and marriage indicators have increased compared to the early 2000s, they still remain low. Research shows that the rural population in the Aran economic region demonstrates a steady growth trend, primarily driven by natural population growth.

- The role of the economic base and social-cultural service facilities in the development of rural settlements has been substantiated. Ensuring employment for the rural population and organizing services for them are identified as key factors in demographic development and play a decisive role in regulating migration.

- It has been established that the development of labor-intensive agricultural sectors, facilitated by flat terrain and freshwater resources, has led to the formation of large rural settlements in the economic region. Measures undertaken to ensure their sustainable development are yielding results. However, weak implementation of agricultural technologies and infrastructure issues continue to limit agricultural efficiency.

- The predominance of the rural population in the economic region is considered the foundation of rural settlement. It has been determined that the weak socio-economic base of urban settlements is a major obstacle to the development of villages. Since these urban centers cannot absorb the rural population, rural settlement will maintain its leading position for a long time.

Theoretical and practical significance of the research:

The conclusions derived from the analyses and the recommendations provided in the dissertation are significant for regulating settlement patterns in the Aran economic region, restructuring its socio-economic base, and ensuring a transition to sustainable demographic development.

The findings of the research can be taken into account during efforts to develop economic sectors and address employment issues in the region, as well as in other areas of the country. The application of the analysis results is also deemed appropriate for studying other similar regions of the country.

The materials and analyses gathered in the dissertation can serve as a resource for scientific research on population geography and as educational material in higher education institutions.

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:

"Geography and Geocology in the Service of Science and Innovative Education." All-Russian Scientific and Practical Conference with international participation. (Krasnoyarsk, 2015); Conference on "Geography: Theory, Practice, and Innovation." (Baku, 2015); "Geographical Problems of Azerbaijan's Regions" National Scientific and Practical Conference. (Baku, 2016); "Demographic

Development in the Republic of Azerbaijan: Population Settlement Prospects and Regional Issues" Scientific Conference. (Baku, 2016); "Geography and Geoecology in the Service of Science and Innovative Education." XI International Scientific and Practical Conference. (Krasnoyarsk, 2016); "Service and Tourism – Innovative Development" VIII International Scientific and Practical Conference. (St. Petersburg, 2016); International Scientific and Practical Conference on "Current Issues of Labor, Employment, and Social Protection." (Baku, 2017); Conference on "Land Management in Market Economy Conditions: Achievements and Contemporary Challenges." (Baku, 2018); "Modern Problems of Geography: Integration of Science and Education" International Scientific and Practical Conference. (Baku, 2022).

13 scientific articles and theses were published on the subject of the research.

The name of organization where the dissertation work was implemented: The dissertation work was carried out at the department of "Geography of the Azerbaijan and teaching technology of Geography" of the Azerbaijan State Pedagogical University.

Structure and volume of the research: The dissertation comprises 162 computer-typed pages, consisting of an introduction, 4 chapters, a conclusion and recommendations, and 192 list of references. Chapter I - 29 pages, chapter II – 25 pages, chapter III-56 pages, chapter IV – 27 pages. To enhance the visibility of the analyses, the dissertation includes 35 tables, 5 charts, as well as 3 maps-schemes. The dissertation contains 227 379 characters.

THE MAIN CONTENT OF THE RESEARCH

In the **Introduction** section of the research, the relevance of the topic is justified, the objectives and tasks of the research are defined, and the scientific innovations and practical significance of the work are presented.

The first chapter of the dissertation analyzes "**The Economic-Geographical and Theoretical-Methodical Foundations of Studying Villages and Rural Population**". The study of villages and the rural population residing in them is of significant importance in the republic, and it is essential to determine its main principles. Rural settlement continues to hold a leading position in the distribution of the population in Azerbaijan. The natural-geographical conditions and agro-climatic resources available for the cultivation of agricultural products over vast areas in the country also influence the placement of rural settlements accordingly. These factors develop in mutual interaction.

The rural population in Azerbaijan is distinguished by high natural growth. This growth plays a significant role in the increase of the population in cities as well, alongside rural areas, through migration, and this function continues to be partly maintained. As of the beginning of 2024, the rural population in the country numbered 4,633.3 thousand people, accounting for 45.5% of the total population. Recently, due to the weak socio-economic base of cities and the slow pace of demographic development, the share of the rural population continues to rise.

The dissertation analyzes the dynamics of indicators determining the demographic development of villages and the growth of the rural population during the second half of the 20th century and the early 21st century. These indicators include: the increase in rural population, changes in its share of the total population, annual growth rate, dynamics of natural growth, and migration.

The results of the analysis show that due to high natural growth in the rural population during the 1960s to 1980s, the number of rural inhabitants increased. During this period, the rural population in the republic grew by an average of 1.0-1.5% annually. In the 1960s, the

natural increase in rural areas ranged from 370,000 to 430,000 people, while the total growth was between 210,000 and 240,000 people. In the 1980s, these figures were 330,000 to 360,000 for natural growth, and 150,000 to 200,000 for total growth. As a result, mass migration from rural areas to cities occurred.

In recent years, the decline in the number of children in families, the intensification of migration, gender imbalances in the population structure, low marriage rates, and the increase in divorces have led to a decrease in natural growth, which has negatively affected the growth of the rural population.

The dissertation indicates that the issues of rural areas' provision with natural gas and water are being addressed, and education and healthcare facilities are being reconstructed. Therefore, rural settlement will retain its leading position for a long time.

Considering the central role of rural settlements, extensive research has been conducted in this area. The issues of population settlement and demographic development in Azerbaijan have been continuously studied since the second half of the 20th century.

M. Baharli's book provides rich information about the population and agriculture of Azerbaijan. Among the scientific works conducted in the country in the 1960s, the research of Sh.Y. Goychayli, A.M. Hajizadeh, E.G. Mehraliyev, N.A. Babakhanov, and A.A. Nadirov holds significant importance. Later, researchers like N.H. Ayyubov, M.O. Sadigov, R. Umudova, and V.A. Afandiyev contributed greatly to this field with their significant scientific works. The establishment of the Department of Population Geography at the Azerbaijan National Academy of Sciences' Institute of Geography in 1986 enabled the expansion and systematic conduct of scientific research in this area.

In the years following independence, researchers such as Z.N. Eminov, R.N. Karimov, E.S. Badalov, and G.S. Samədov conducted studies on population settlement and demographic development at the regional level. Additionally, economists and scholars like M.M. Allahverdiyev, K.V. Mammadov, Sh.M. Muradov, and J.B. Guliyev have written significant works on Azerbaijan's demographic development and the utilization of labor resources.

Additionally, the study of population settlement and demographic development issues remains consistently relevant in Azerbaijan. In regions where rural agriculture has minimal impact on population settlement, there is a demand for scientific research to explore solutions to the challenges in meeting the social and cultural needs of the population.

Taking these into account, *the tasks of economic-geographical research* are determined in the dissertation on the study of rural settlement. During the study of villages, it is important to evaluate the natural-geographical conditions and natural resources that determine their formation, determine the impact on the development of settlement, identify ways to strengthen the role of rural agriculture in the development of the settlement's economic base. Therefore, it is necessary for economic-geographical and demographic research to be conducted in mutual correlation.

The reforms carried out in rural agriculture do not fully provide opportunities for the development of villages. Therefore, serious problems still persist in providing employment for the rural population. About 12-13% of the income of rural residents comes from agricultural activities. At the same time, limited income, as well as the financial and technical resources of municipalities, hinder their ability to increase their role in addressing social and cultural problems and meeting the needs of the population.

The dissertation analyzes the demographic potential, current status of economic and socio-cultural development of villages, the main causes of problems in these areas, and the ways to address them. The research also highlights issues such as the weak staffing of educational, healthcare, and cultural institutions in rural areas, the low level of social protection, insufficient wages, and the inadequate allocation of financial resources to these sectors. As a result, many of these institutions fall behind modern requirements.

The economic regions of the country differ sharply in terms of the distribution of demographic potential, with the rural population reaching 60-70% in most economic regions. The regions continue to lose their demographic potential.

In the second chapter of the dissertation, **the natural-geographical and socio-economic conditions of rural settlement development in the economic region are examined.** The utilization of the potential opportunities of *natural-geographical conditions* forms the basis of rural settlement development. While flat relief and smooth surface areas within the region allow for widespread settlement, there are often negative effects as well, with the formation of saline terrains leading to problems in this area.

The climatic conditions and agro-climatic resources of the plain allow it to be formed as the most important agricultural region of the country. This area plays a fundamental role in the development of rural settlements. Labor-intensive fields such as cotton growing, vegetable farming, and gardening contribute significantly to the formation of large rural areas. The average annual temperature in the Aran region ranges from 14.0 to 14.5°C, with daily average temperatures above 10°C varying between 4000-4500°C.³ The mild winter conditions facilitate the cultivation of autumn wheat in the plains. The high thermal conditions allow for the possibility of harvesting crops two, sometimes three times a year. However, the low rainfall, the hot and dry summer conditions, and the need for artificial irrigation require farming to be conducted under controlled conditions. Therefore, rural settlements in the Aran region are concentrated along the Kura and Araz rivers, as well as in the river basins that flow from the mountains into the area. The climate's aridity, strong winds, and torrential rains are factors that significantly impact rural settlement.

In the Aran region, the country's most important water arteries, such as the Kura, Araz, Tartar rivers, and their smaller tributaries, flow through the area. The dissertation extensively analyzes the role of the Kura and Aras rivers in the rural settlement of the region, along with their utilization and the problems they create. Canals originating from the rivers and created reservoirs not only contribute to the irrigation of agricultural fields but also significantly impact the settlement of villages. Irrigation necessitates the creation of a collector-drainage

³ Geography of the Republic of Azerbaijan. Volume I. Baku, – 2015, – p. 150-152, 176-179.

network in the Kura-Araz lowland. The main collectors such as the Upper Shirvan and Upper Mil-Mugan have an important economic importance.

Soils only achieve high productivity through the implementation of specialized agro-technical measures. In hot and dry climate conditions, the amount of humus is low, and the change in soil types on vast areas is less noticeable. In the economic region, large areas are covered with brown soil, alluvial-brown soils in floodplains, and swamp-meadow soils in areas close to the surface of underground waters. The Southeast Shirvan plain is covered with gray-brown soils. It is essential to protect the soils used in agriculture from erosion, salinization, and re-salinization.

Due to the low rainfall and high thermal conditions, the vegetation cover in the area is sparse. The region is dominated by desert, semi-desert, dry steppe, and marshy-grassland plants. Since much of the land has been developed, natural landscape areas are limited, and many of the riparian forests along the rivers have been cleared and converted into agricultural land.

The Aran region has a diverse industrial structure. This is influenced by the presence of oil and gas reserves, raw materials for construction materials, the hydroenergy potential of rivers, and the functioning of agricultural product processing enterprises.

The Aran economic region contributes 2.83% to the country's industrial output, with 10.7% of industrial workers employed here (2019)⁴. Despite having industrial centers such as Mingachevir, Shirvan, and Yevlakh, as well as more than 15 district centers, the industrial potential is weak. The restoration of existing facilities, establishment of new production and processing facilities, utilization of local entrepreneurs' financial and technical capabilities, and limited state financial support are progressing slowly.

In the economic region, the processing industry accounts for 49.8% of total output⁵. The food industry holds a prominent position with a share of 33.8%. Flour mills and bakeries are prevalent in most

⁴ Regions of Azerbaijan – 2019. – Baku. – SSC, – 2020.

⁵ Industry of Azerbaijan – 2021. –Baku, – SSC, – 2022.

districts. There are sugar factories in Imishli, canneries in Bilasuvar, Saatli, Sabirabad, Goychay, milk processing enterprises in Aghjabedi, Barda, Goychay, Kurdamir, and wine factories in Goychay and Kurdamir.

The foundation of the light industry is cotton ginning, which accounts for 7.5% of the sector. The activity in this field is being restored. The expansion of the Light Industry Industrial Park in Mingachevir city will allow for an increase in its share. Other sectors are underdeveloped and do not play a significant role in the industrial structure.

In the section **"Impact of agriculture on territorial organization and rural settlement"** it is shown that the Aran is the most important agricultural region of the country. The region accounts for 22.8% of the country's agricultural products, including 29.5% of crop products and 34.1% of livestock products. Furthermore, 34.1% of grain fields, 46.7% of cotton fields, 68.7% melon crops, 27.4% of vegetable gardens, and 15.6% of fruit orchards are located here. The majority of agricultural products (52.7%) come from livestock farming⁶.

The economic region has 716,000 hectares of cultivated land. In areas such as Kurdamir, Agjabadi, Sabirabad, Neftchala, Barda, and Saatli, agricultural lands exceed 50,000 hectares. After the agricultural reforms in the country, cotton cultivation has significantly decreased, while the areas dedicated to cereals, vegetables, and potatoes have expanded. This situation has led to agriculture becoming more consumption-oriented.

In the region, the cultivation of grains and grain-legume crops covers an area of 336.3 thousand hectares (47.0%), while cotton cultivation covers 48.7 thousand hectares (6.8%). Fruit and berry crops occupy 34.8 thousand hectares (4.9%), and melon-vegetable crops cover 31.7 thousand hectares (4.4%). Additionally, sugar beet, sunflower, potatoes, grapes, and fodder crops are also cultivated here (2022).

⁶ Agriculture of Azerbaijan – 2022. – Baku: – SSC, – 2023, – 709 p.

In the region, there are 1061.0 thousand heads of cattle, 2502.5 thousand heads of sheep and goats (31.5%), and 10816.0 thousand heads of poultry. However, productivity in this sector is still low, and there is a weak network of processing facilities. As a result, only a small portion of domestic demand is met.

The third chapter of the dissertation is dedicated to the **demographic development characteristics of the rural population in the economic region**. Among them, the study of the natural growth of the rural population holds a special place. Although natural growth is the main source of changes in population size, it can undergo changes in a short period of time due to the influence of social-political, economic, and demographic factors.

The difficulties that arose during the years of independence led to a significant decrease in natural population growth. Starting from 1990, due to a decline in the number of children per family, natural growth sharply decreased, and this situation persisted until 2003.

In recent years, declines in these indicators are still being observed. In 2023, the birth rate per 1,000 people in the rural population of the Aran region was 13.3, and the natural growth rate was 7.7, which are above the national average (Diagram 1). Since 2015, the region has seen a decrease of 34.8% in births and 48.7% in natural growth. Currently, there are no significant differences in birth and natural growth rates between urban and rural areas (Figure 1).

At the same time, significant changes have occurred in the gender composition of births in the country. In 2023, among the rural population of Aran, the number of boys born exceeded that of girls by 1,142, and natural growth was 721 higher. Considering that this trend has continued for over a decade, it can be stated that the gender composition of the population has already changed, with men outnumbering women in most administrative districts.

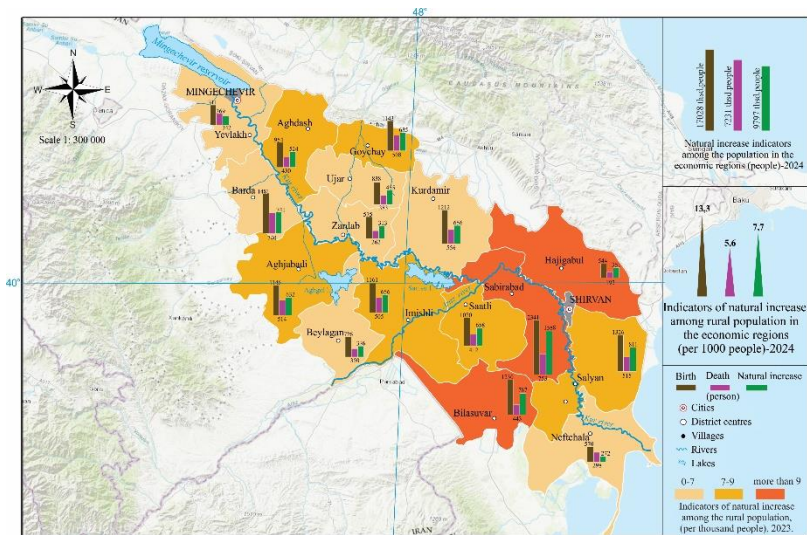
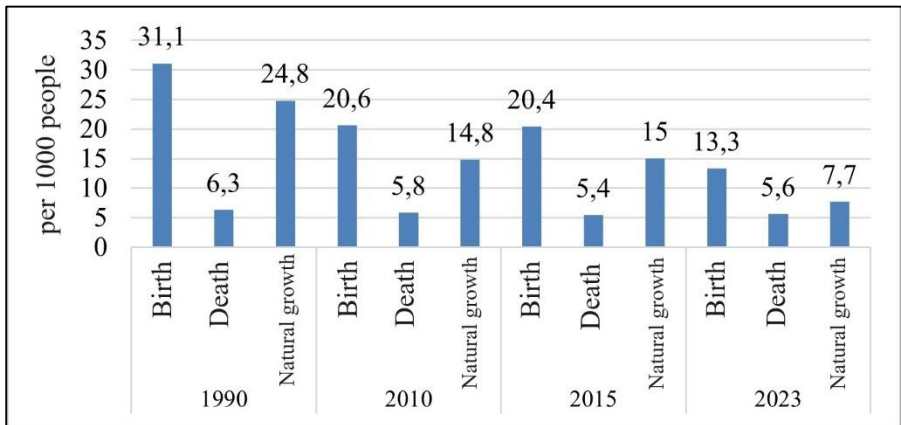


Figure 1. Natural population growth in rural areas of the Aran economic region



Source: The diagram was compiled based on 2023 data from the State Statistics Committee.

Diagram 1. Natural population growth indicators in rural areas, per 1000 people

Infant mortality is one of the factors that significantly affects demographic development. In the country and its regions, the majority of infant deaths are attributed to the urban population. In 2023, in the

economic region, 448 children under the age of 1 died, with 248 of those deaths occurring among the rural population. The rate of infant mortality per 1,000 live births stands at 14.6, which is higher than the national average for rural areas.

The gender and age composition of the rural population has undergone significant changes in recent years. The prevalence of male births and the higher mortality rate among males determine the gender composition of the population. While the number of women is higher among the general population of the economic region, there are more males among the rural population, with 983.9 women per 1000 men. This situation applies to all administrative regions except Neftchala, Imishli, and Saatli. Their number is equal in Kurdamir and Hajigabul regions. The higher number of males can create difficulties in arranging marriages and ensuring labor reserves.

The high natural increase in the population's *age structure* until the independence years, followed by its sharp decline in subsequent periods, despite the increase in the average life expectancy, results in high mortality rates among the elderly population. From 2009 to 2009, the proportion of children aged 0-14 decreased from 24.9% to 24.0%, while the special weight of the population aged 15-64 increased from 69.5% to 70.2%. The increasing number of the working-age population in the near future will lead to a rapid increase in the number of elderly people. This situation requires additional expenditures for their social protection.

Family-marriage relations of the population are associated with *marriages and divorces*. Marriages affect the natural increase of the population. In 2023, among the rural population of the region, there were 7383 marriages and 1872 divorces, recorded at rates of 5.7 and 1.5 per 1000 people respectively. Although relatively lower than in 2005, divorces have been increasing rapidly in recent years. This is influenced by early marriages, housing conditions of the population, and problems in earning income. The dissertation provides the dynamics of the gender-age composition, marriages, and divorces across administrative regions.

The number of rural population is a significant demographic indicator. The economic region ranks second in the country in terms

of population. At the beginning of 2024, there were 2,032.6 thousand people living here, of which 1,280.4 thousand (63.0%) reside in rural areas. The dissertation extensively analyzes the dynamics of population, factors influencing it, distribution across administrative regions, their specific characteristics, and the share of rural population. The analyses show that the high natural increase in rural areas in the period of 1989-1999 has contributed to a significant increase in the population. Therefore, despite a relatively weak increase, the share of the economic region in the country's rural population has increased, and its proportion to the total population (20.0%) is significantly higher. In recent years, the decline in natural growth has also affected the dynamics of the population. Since 1989, the rural population of the economic region has increased by 394,000 people (46.9%), which is above the national average.

Administrative regions vary in population. Factors such as their Economic Geographical Position, the number of rural areas, economic potential, proximity to fresh water sources, and the development of rural agriculture play a significant role (Table 1).

Sabirabad (145.9 thousand people) and Barda (116.3 thousand people) districts rank as leading regions in terms of rural population. In Imishli, Saatli, Kurdamir and Salyan districts, the rural population is over 90.0 thousand people, while in Aghjabadi, Bilasuvar, and Goychay districts, it exceeds 80.0 thousand people. In these districts, the rural population is rapidly increasing, there are many rural areas, and cotton cultivation is a leading sector in rural agriculture. In Hajigabul, Neftchala, and Zardab districts, there are fewer than 50,000 rural inhabitants.

The level of urbanization in Yevlakh, Hajigabul, Neftchala, and Beylagan districts is above 40% due to the development of urban settlements. The dissertation examines the share and dynamics of rural population across administrative regions. In most regions, the presence of only urban centers as urban areas and a high rural population contribute to the increase in their share. In regions such as Aghjabadi, Aghdash, Goychay, Imişli, and Salyan, this indicator ranges between 60-70%, while in Saatli, Sabirabad, and Kurdamir districts, it is above 80%.

Table 1

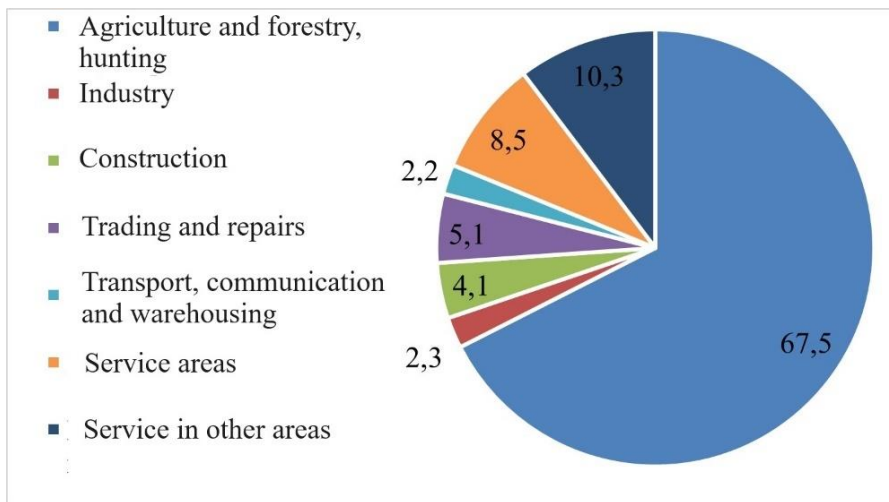
Changes in the number of rural population in administrative districts

Administrative districts	Population, thousand people				
	1989	1999	2009	2019	2024
Aghjabadi	60.6	74.1	75.1	82.6	85.5
Aghdash	50.7	62.7	65.8	70.0	72.8
Beylagan	53.8	62.7	49.9	57.5	59.3
Barda	76.6	93.6	103.8	112.5	115.7
Bilasuvar	42.5	57.6	67.4	78.9	82.7
Goychay	54.0	65.7	73.2	81.1	84.3
Hajigabul	26.1	31.5	31.9	36.8	38.6
Imishli	56.2	69.3	77.6	87.9	91.2
Kurdamir	60.1	74.6	82.9	92.9	96.2
Neftchala	34.8	39.2	41.7	45.6	47.2
Saatli	51.5	66.2	75.2	86.9	90.3
Sabirabad	91.7	109.6	123.4	142.7	149.6
Salyan	60.8	73.0	81.1	91.5	95.0
Ujar	48.7	55.8	61.3	65.6	67.9
Yevlakh	41.9	49.6	53.0	55.3	56.7
Zardab	29.7	35.4	41.8	45.9	47.4
Economic region	839.7	1020.6	1105.1	1233.7	1280.4
The share of the economic region, %	26.1	26.2	26.4	27.4	27.6
Azerbaijan Republic	3215.3	3889.2	4183.3	4511.1	4633.0

Sources: Final results of the 1999 Population Census of the Republic of Azerbaijan. Part I. Population size, gender-age composition. Baku: State Statistical Committee, 2000, pp. 25-35. Final results of the 2009 Population Census of the Republic of Azerbaijan. Part I. Population size, distribution, gender, age composition, and marital status. Baku: SSC, 2010, pp. 24-30. Population Census in the Republic of Azerbaijan. 2019. Volume I. Population size, distribution, gender, age composition, and marital status. Baku: SSC, 2022, pp. 30-32. Demographic Indicators of Azerbaijan - 2023. Statistical Compilation. Baku, SSC 2024, pp. 81-83.

While rural *employment* is a crucial factor for demographic development, it also determines the formation of rural incomes. Agriculture plays a leading role in rural employment, accounting for

up to 40% of the total employment in the country, with this indicator exceeding 67.5% for the rural population in the region⁷.



Source: Population Census of the Republic of Azerbaijan – 2019. Volume XIV. Distribution of the Employed Population by Economic Activity Sectors by Age and Age Groups. – Baku: – State Statistical Committee, – 2022. – pp. 10-109, – 805 pages.

Diagram 2. Distribution of Employed Rural Population by Economic Activity Types, 2019, in Percentage

The dissertation examines the employment structure of the rural population based on the census materials of 2009. The analyses conducted reveal that in Imishli, Saatli, Aghjabadi, Sabirabad, and Zardab districts, over 65-70% of the rural population is engaged in agriculture. Similarly, in Barda, Bilasuvar, Beylagan, and Goychay districts, this figure exceeds 60%. Even in Yevlakh, Hajigabul, and Neftchala districts, around 60% of the rural population works in this sector. The underdevelopment of service sectors in rural areas of Aran leads to a lower level of employment in this field, accounting for 8.5% of the total employment. The weak development of sectors processing

⁷ Population census of the Republic of Azerbaijan - 2019. Volume XIV. Distribution of the employed population by age and age groups by types of economic activity. – Baku, – SSC, – 2022. – pp. 10-109.

agricultural products and the low level of industrial potential in large cities and regional centers lead to a decrease in employment in this sector, indicators dropping to 2.3%.

Aran is the main region in the country where rural settlements are widespread. In 2019, the economic region had 1,233,700 rural inhabitants settled in 790 villages. Over the past period, the number of villages has remained unchanged. The dissertation provides a comparative analysis of rural settlements and rural populations based on census data from 1999 and 2009.

The analysis shows that since 1999, 26 new rural settlements have been established in the region. As the population of villages grows, they continually advance to higher levels. Therefore, the number of villages with populations up to 500 people decreased from 156 in 2009-2019 to 135, and the share of the total rural population in these villages fell from 4.4% to 3.4%. During this period, the number of villages with populations between 500-1000 people and the share of the population living in these villages also decreased (Table 2).

Settlements with populations ranging from 1000 to 2000 people play a leading role in the rural population distribution. In 2019, they accounted for 33.3% of rural settlements and 30.8% of the rural population, ranking first in grouping. Villages with populations between 2000 and 3000 people are also significant. Both groups serve as central hubs for rural areas, holding a leading position in managing and organizing rural settlement.

Villages with populations exceeding 3000 people should ideally have favorable Economic Geographical Position, access to water sources, and development opportunities in agriculture. Over the 10-year period, the proportion of the population in these villages increased from 18.2% to 22.7%. In Aran, there are 20 villages with populations exceeding 5000 people, totaling 135.3 thousand inhabitants. They possess potential opportunities for the establishment of cities and settlements.

Table 2

Grouping of the rural population in the economic region

Groups, people	2009				2019			
	Villages		Rural population		Villages		Rural population	
	Number	%	number	%	number	%	number	%
0-50	5	19.7	70	0.0	3	17.1	3	0.0
50-100	6		540	0.05	4		300	0.02
100-200	18		2885	0.3	17		2509	0.2
200-500	127		45780	4.1	111		39023	3.2
500-1000	211	26.7	157300	14.3	193	24.4	144387	11.7
1000-2000	256	32.3	362737	32.8	263	33.3	380385	30.8
2000-3000	97	12.3	233882	21.2	104	13.2	251780	20.4
3000-5000	55	7.0	200954	18.2	75	9.5	279998	22.7
More than 5000	16	2.0	100766	9.1	20	2.5	135330	11.0
Total	791	100.0	1104914	100.0	790	100.0	1233715	100.0

Sources: Results of the 2009 Population Census of the Republic of Azerbaijan. Part I. Population by number, distribution, gender, age structure, and marital status. Baku: State Statistical Committee, 2010, pp. 24-30; Population Census in the Republic of Azerbaijan. 2019. Volume I. Population by number, distribution, gender, age structure, and marital status. Baku: State Statistical Committee, 2022, pp. 16-410.

The dissertation outlines the ways to regulate the socio-demographic development of rural areas and delineates the settlement areas⁸. Along the Kura River, the main trunk railway and highways have formed the primary settlement area of the country.

The fourth chapter of the dissertation is dedicated **to the socio-cultural problems of the villages and the study of their elimination directions**. *Education* - has a multi-field and multi-level structure as

⁸ Aliyeva L.I. Rural settlement areas in the Aran economic region. Proceedings of the conference on "Geography: theory, practice, and innovation", Baku State University, – 2015. – pp. 271-279.

it covers the entire population. The provision of pre-school education institutions is still at a low level and covers 28.5% of children in the country, 17.9% in villages. 19108 people are educated in up to 379 pre-schools operating in the region, no new facilities were built after 2014. Therefore, it is necessary to attract private funds to this field.

In the 2022/2023 academic year, 304300 students were enrolled in 929 general education institutions in the region, which is 8000 fewer than in 2018. No new schools have been built in the region in the last five years, and about 10-15% of students attend second and third shifts. Recently, this percentage has decreased.

Healthcare services significantly lag behind the national average. In 2022, the number of doctors per 10,000 people in the republic and the economic region was 32.4 and 8-14, respectively. The number of nurses was 53.1 and 28-42, and the number of hospital beds was 37.5 and 14-19. While there were 250 hospitals in the region in 2000, this number has now decreased to around 31. Many specialized hospitals in district centers and outpatient clinics in villages have been closed.

Trade facilitates the sale of daily and periodic use products to the population. The dissertation comparatively analyzes the indicators of trade and paid services, public catering and household services, retail trade turnover, and their per capita values since 1990. These indicators significantly lag behind the national average, amounting to only 60.6% of it.

In 2019, the economic region had 38.1 million square meters of housing area, accounting for 21.3% of the country's total. The per capita housing area in the regions of Barda, Hajigabul, Beylagan, Salyan, Sabirabad, Yevlakh, and Aghjabedi exceeds the regional average, being over 18.0 square meters. In the cities of Mingachevir and Shirvan, and in the districts of Zardab, Ujar, and Kurdamir, the level of housing provision is below average. There are also problems with water supply and the establishment of sewage systems for the population.

The limited financial resources allocated to social and cultural facilities such as *libraries, clubs, museums, and cinemas* have led to a decrease in their numbers and a reduction in the number of employees

in these sectors. In 2022, the region had 719 libraries, 556 clubs, and 44 museums. Apart from museums, there have been declines in the operation of other facilities and in the number of visitors they receive.

There is a shortage of qualified personnel in the social and cultural service sector. It is essential to improve material and technical support, strengthen social protection for employees, and establish incentives for staffing these positions.

The dissertation identifies *the priority directions for the development* of the region's infrastructure sectors. There are still shortcomings in healthcare, household, public catering services, retail trade turnover, and tourism development in the regions. Sharp differences have emerged in the average performance indicators between Baku and other regions.

In the Aran economic region, there are significant challenges in providing employment opportunities for the rural population, with the number of new jobs created falling far short of the existing demographic potential. In 2018, only 8.5% of the country's investments were directed to Aran, with 70.1% of those investments concentrated in the Absheron region. Therefore, it is crucial to increase investments in other regions.

In order to increase the share of regions in the socio-economic development of the country, to effectively use their natural-geographical conditions, natural resources and demographic potential, "State Programs for the Socio-Economic Development of Regions" have been implemented since 2004.

During the implementation of the State programs, the country's main highways were reconstructed, branches of "Agrolizing" JSC were established in administrative regions, and cultivation areas for cotton, grain, and sugar beets were expanded, along with the construction of processing facilities. In the framework of the second and third State Programs, the development of the non-oil sector was prioritized, leading to the opening of new businesses in these sectors and an increase in the population's income and living standards. These measures also encompass the rural population.

Results:

1. In the Aran economic region, the natural and geographical conditions have played a leading role in the formation and development of settlements over long historical periods. Fertile soils, flat terrain, and fresh water sources determine the development and location of rural settlements, providing favorable conditions for the growth of agriculture, which forms the economic base of these settlements. After the second half of the 20th century, the construction of collector-drainage networks, reservoirs, and irrigation canals significantly influenced the placement of rural settlements. However, challenges such as floods in rivers, soil salinization, changes in the Caspian Sea's water levels, and the inefficient use of fresh water resources are key problems affecting the development of the region.

2. Currently, the employment level among the rural population in the region is low, and the social and cultural services provided to them fall short of modern standards. As a result, migration from rural areas continues, with the majority of the rural population working in cities. This trend highlights the ongoing challenges in rural development, where the lack of sufficient economic opportunities and modern infrastructure contributes to the continued shift of the population from villages to urban centers.

3. In the Aran economic region, the rural population has historically contributed to a high natural population growth. However, in recent years, there has been a decline in both birth rates and natural growth. This trend is influenced by factors such as families' inclination to have fewer children, women's employment, and financial difficulties. Currently, rural areas no longer play a leading role in natural growth, and there is no significant difference between the birth and natural growth rates of urban and rural populations. Moreover, the gender composition of newborns is also affected, with the number of male births exceeding that of female births.

The recent imbalance in the gender ratio of newborns, with a significant increase in the number of boys, is also having a serious impact on the overall gender composition of the population. Although women still outnumber men in the general population, the number of

men exceeds that of women in rural areas. In most administrative districts within the Aran economic region, men outnumber women among the rural population. This situation may lead to problems in the future regarding marriage rates and meeting the demand for labor resources.

4. In most of the administrative districts within the economic region, the proportion of the rural population is high. However, in districts with a high level of urbanization such as Yevlakh, Neftchala, Hajigabul, and Beylagan, the rural population is relatively low, and its growth rate is slow, resulting in a lower share of the rural population.

5. In the economic region, the dominance of the rural population and natural growth allow for an increase in the population size of settlements, pushing them to higher groups. Settlements with populations ranging from 1,000 to 3,000 people dominate in rural areas. The widespread practice of labor-intensive cotton farming plays a key role in the formation of large rural settlements in the Aran region. These settlements are primarily located near fresh water sources and serve as the main centers for managing the settlement system.

6. In the rural settlements of the region, many healthcare facilities have been closed or merged. As a result, the number of hospital beds, doctors, and medical staff has decreased. The relative indicators characterizing the performance of this sector have declined and are significantly lower than the national averages.

Recommendations:

1. The development of agriculture, which forms the economic base of rural areas, along with increasing productivity and creating supply points, will contribute to increasing employment in this sector and raising the role of agriculture in household income. To address the issues in this sector, it is important to enhance the state's financial and technical support and expand the financial base of ongoing state programs.

2. To ensure the continuous growth of the population in rural areas, it is essential to develop social and cultural services, establish transportation and communication networks, and address employment-related challenges.

3. To improve the social and cultural services provided to the population, it is crucial to create new networks of facilities, build healthcare institutions, and organize social protection for doctors and medical staff. The low level of service provision, trade, and paid services also play a role in this. To improve these services, it is necessary to increase the income levels of the population.

The scientific works published in accordance with the topic of the dissertation:

1. Aliyeva, L.I. Rural settlement areas in the Aran economic region. // Proceedings of the conference on "Geography: theory, practice, and innovation", Baku: – 2015, – pp. 271-279. (in Aze.)

2. Aliyeva, L.I., Social-demographic problems of rural settlement in arid regions of Azerbaijan. // Materials of the All-Russian scientific-practical conference "Geography and Geoecology in the Service of Science and Innovative Education". Issue 10. Krasnoyarsk State Pedagogical University, – Krasnoyarsk: – 2015. – pp. 177-180 (co-authores Eminov Z.N. and Abbasova V.Z.). (in Rus.)

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A handwritten signature in blue ink, appearing to be 'F. Baghirova', written in a cursive style.

The defense of the dissertation work will be held on the 27 december at 1900 at the meeting of the Dissertation Council FD 2.51 of Supreme Attestation Commission under the President of the Republic of Azerbaijan operating at the Baku State University.

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The dissertation is accessible at the library of the Baku State University.

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