

**AZERBAIJAN REPUBLIC**

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**ABSTRACT**

of the dissertation for the degree of Doctor of Philosophy

**MODERN REGIONAL CHANGES IN THE AGRICULTURAL  
STRUCTURE OF THE NAKHCHIVAN ECONOMIC REGION  
AND THEIR MANAGEMENT**

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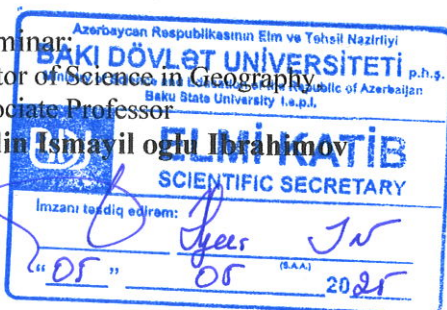
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## **GENERAL CHARACTERISTICS OF THE RESEARCH**

**Relevance of the topic and degree of study.** The implementation of structural changes in agriculture, the organization of cultivating crops suited to the natural and geographical conditions, the transition to the specialization of more productive and profitable sectors, and the assurance of the country's food security have gained particular relevance in the modern context. In recent years, the changes observed in the country's agriculture, including that of the Nakhchivan economic region - the emergence of multi-structured entities with various organizational and legal forms, the diversification of product types and production structures, and the measures taken to ensure balanced regional development - have all been carried out in accordance with the demands of the global economic system.

The management of structural changes within the agricultural sector and the provision of effective operation for light and food industry facilities included in the agro-industrial complex highlight the complexity of the tasks facing agricultural policy. In this context, regional changes in agriculture within the Nakhchivan economic region require a specific approach. Therefore, there is a need to assess the effectiveness of structural changes in the activities of entities engaged in agricultural production, to develop and implement mechanisms for regional policy and rational proportions, as well as to ensure their continuous improvement.

The formation of an efficient agricultural system is one of the key economic factors accelerating regional development. Specifically, the implementation of new forms of efficient economic relations, the establishment of new structural units, and the application of management models are directly linked to the transformation of agriculture into a market-oriented economic system. In this regard, integration processes manifest themselves in structural changes across various areas of regional agro-economic activity, in eliminating intra-sectoral inconsistencies, expanding

opportunities for the redistribution of resources, and ensuring the efficient use of production resources.

The territorial organization and development of agriculture should serve to meet the food needs of the population within the economic region, to establish processing enterprises, to enhance the role of this sector in shaping household incomes, and to increase employment, among other objectives. It should also function as the economic foundation of rural settlements. At present, a number of important steps have been taken by the state towards the formation of a regional agricultural system, and legislative documents and state programs have been adopted in this direction.

The “Socio-Economic Development Strategy of the Republic of Azerbaijan for 2022-2026” envisions “the efficient use of the economic and natural potential of the regions, the promotion of private investment attraction, and the state-supported development of regional mechanisms in line with new challenges.” The document “Azerbaijan 2030: National Priorities for Socio-Economic Development” highlights key issues such as “further increasing economic activity in the regions and ensuring their rapid development.” In 2014, a decree titled “On Measures to Improve the Management and Accelerate Institutional Reforms in the Agricultural Sector” was issued. This decree emphasized ensuring the implementation of agricultural policy at the district level, organizing state support measures for agriculture, and establishing effective cooperation with relevant local structural units in solving problems related to the agricultural sector - factors of particular importance for the regional development of agriculture. Additionally, state programs covering different periods outline these directions and establish priorities for their implementation.

These points indicate that it is essential to improve regional structural changes in agriculture within the Nakhchivan economic region by utilizing local and international best practices, scientifically grounded methods, organizational structures, and ensuring adequate information and human resources. It should also be noted that structural changes in this sector must be implemented

through enhancing the efficiency and quality of the agricultural management mechanism.

Today, the main problems hindering the development of agriculture in the regions include the predominance of subsistence-type farms under conditions where small land plots are widespread; difficulties in developing new, high-yield crop varieties and livestock farming; the weak material and technical base; challenges in establishing new and large specialized agricultural entities and their limited number; and the absence of procurement centers at the local level. Investigating scientifically grounded solutions to these issues is of vital importance. These problems are directly related to the management of regional structural changes in agriculture and the identification of ways to address them, thereby confirming the relevance of the research topic.

Issues related to regional changes in the structure of agriculture and the identification of their effective directions have consistently remained at the center of researchers' attention. Numerous scholars and researchers in the Republic have conducted extensive studies in this field. Among them are A.A. Nadirov [200], A.A. Gurbanzade [2017], N.A. Pashayev [2010], Z.N. Eminov [2008], A.Kh. Nuriyev [2017], B.T. Nazirova [1975], E.A. Guliyev [2020], I.H. Ibrahimov [2016], V.H. Abbasov [2017], N.A. Javadov [2009], Ch.N. Ismayilov [2015], and others. The regional aspects of structural changes and their management have also been widely studied by foreign experts. In this regard, the research of I. Thunen [1926], A.G. Koval [2018], T.V. Abalkina [2014], T.V. Voronina [2010], Y.E. Alekseicheva [2016], N.A. Borkhunov [2017], O.S. Belokrylova [2016], O.V. Spasskaya [2003], O.Y. Krasilnikov [1999], and others can be noted.

It should be noted that both local and foreign experts have primarily focused on regional changes occurring in agriculture and their management. However, the management mechanism of these regional changes in the agricultural structure has not been sufficiently addressed. In this regard, the topic of the research is characterized by its comprehensiveness and specificity.

**The Object and Subject of the Research.** The subject of the dissertation research is the Nakhchivan economic region, while its focus is on the directions of regional changes occurring in the modern territorial organization and structure of agriculture within the economic region and the issues related to the improvement of their management.

**The Purpose and Objectives of the Research.** The aim of the research is to identify the main directions of modern regional changes occurring in the agricultural structure of the Nakhchivan economic region, to further improve the agricultural structure, to reveal the inconsistencies and backwardness in this field, and to develop proposals and recommendations related to these issues. The following tasks have been defined in this direction:

- determining the impact of historical, natural-geographical, and socio-economic factors on the territorial organization of agriculture;
- investigating the role of agrarian reforms in the changes occurring in the territorial organization and structure of agriculture;
- analyzing the development dynamics of agricultural sectors;
- identifying the changes in the modern sector structure of agriculture and revealing internal disparities in the region;
- determining the role of State Programs in the efficient territorial organization of agriculture and the improvement of the agricultural structure.

**Research Methods.** In the dissertation work, historical, comparative analysis, mathematical-statistical, system-structural, and cartographic methods have been used.

**Key Propositions Submitted for Defense:** The main points presented for defense are as follows:

- The impact of historical, natural-geographical, and socio-economic factors on the territorial organization of agriculture in the Nakhchivan economic region.

- Analysis of the development dynamics of agricultural sectors and the changes in territorial organization during the period of agrarian reforms in the Nakhchivan economic region;
- Investigation of internal regional differences in the territorial organization of agriculture in the Nakhchivan economic region.
- The role of State Programs in the efficient territorial organization of agriculture and the improvement of the agricultural structure in the Nakhchivan economic region.

**Scientific Novelty of the Research.** As a result of the investigation into the modern regional changes occurring in the agricultural structure of the Nakhchivan economic region and their management, the following scientific innovations have been achieved.

- The role of historical, natural-geographical, and socio-economic factors in the development of the agricultural sector has been determined.
- The impact of agrarian reforms on improving the changes in the territorial organization and development of agriculture in the economic region has been examined.
- The current state of the agricultural structure in administrative districts has been analyzed, and leading sectors have been identified.
- The role of State Programs in the efficient territorial organization and improvement of the agricultural structure in the economic region has been studied, and the necessity of developing a new action plan to address existing problems in this field has been emphasized.

**Theoretical and Practical Significance of the Research.** The theoretical significance of the research lies in the scientific and theoretical justification of structural changes in agriculture and their management. The key findings and proposals derived from the research can serve as a foundation for the development of agriculture and the improvement of territorial organization in the Nakhchivan economic region.

**Approval and Application.** The theses and findings substantiated in the dissertation have been presented at national and international scientific and scientific-practical conferences.

Scientific Conference on “Human and Environmental Relations” (Baku, 2017), “UMTEB International Congress on Vocational & Technical Sciences-X” (Turkey, 2020), International Conference on “Diversification of Industry in the Nakhchivan Autonomous Republic as a Factor of International Economic Integration” (Nakhchivan, 2022), International Scientific-Practical Conference “Issues of Science in the 21st Century: Current Research and Scientific Potential” (Moscow, 2022), International Conference “A Place Where Cultures Intersect” (Nakhchivan, 2020), Republican Conference on “Heydar Aliyev and Issues of National Statehood” (Nakhchivan, 2023), International Conference on “Modern Silk Road and Nakhchivan – 2” (Nakhchivan, 2022), Republican Scientific Conference on “Ecological Chemistry and Current Problems of Environmental Protection” (Baku, 2024).

A total of 16 scientific articles and conference papers related to the content of the dissertation have been published.

**Organization Where the Dissertation Was Conducted.** The dissertation was carried out at the Department of Geography of Nakhchivan State University.

**The volume and structure of the dissertation.** The dissertation consists of an introduction, four chapters, a conclusion, and a list of references. The structure is as follows: Introduction – 6 pages, Chapter I – 20 pages, Chapter II – 23 pages, Chapter III – 49 pages, Chapter IV – 27 pages, Conclusion – 3 pages, and a bibliography comprising 144 references. The dissertation work consists of 142 computer – typed pages. The research includes 3 maps, 5 diagrams, and 26 tables. The total length of the dissertation is 202516 characters.

## MAIN CONTENT OF THE DISSERTATION

The “**Introduction**” includes the relevance of the topic, the degree of development, the object and subject of the research, the aims and objectives, the main theses to be defended, the methods used, the theoretical and practical significance of the research, its approbation, application, and other aspects.

Chapter I of the dissertation is titled “**Theoretical and Methodological Foundations and Natural Base of Studying Agriculture in the Region.**” In this chapter, the theoretical and methodological foundations of studying agriculture, the historical-geographical development characteristics of agriculture, and the role of the natural-geographical environment in the formation of agriculture are discussed. Initially, the scientific-theoretical significance of studying agriculture is analyzed. Agriculture is an economic activity where humans use natural resources to produce food and raw materials. It encompasses both crop farming and animal husbandry and is studied from various aspects by many scientific disciplines.

In the early 20th century, detailed scientific analyses of the development of agriculture and territorial organization in the Nakhchivan economic region are provided in M. Baharly’s book *Azerbaijan* (1921). The book describes the natural-geographical characteristics of Azerbaijan, particularly the Nakhchivan region, and provides analyses of its relief, rivers, and soils. In his work, M. Baharly analyzes the agricultural sectors of plant growing and animal husbandry in the Nakhchivan economic region, highlighting their regional differences with statistical data. He notes that in 1917, *“Nakhchivan had a total of 146.1 thousand desyatins of land, of which 138.2 thousand desyatins were arable, and 7813 desyatins were orchards. During that period, barley, wheat, and rice were cultivated there”*.<sup>1</sup>

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<sup>1</sup> Baharly M. Azerbaijan. Baku, “Azernashr”, 1993, 208 p.

Research on the economy of the Nakhchivan economic region has been widely conducted since the second half of the 20th century. Among these, A.A. Nadirov's monograph "*The Nakhchivan ASSR*" (1959) stands out for the comprehensiveness of its analyses. The book provides an in-depth study of the economic geography of Nakhchivan, examining the natural-geographical foundations of economic development, natural resources, and the possibilities for their utilization. It analyzes the historical and geographical characteristics of economic development in the region. It is noted that the region, which has always been one of the important centers of agriculture, has cultivated high-quality fruit, grapes, grain, and cotton.

In the study of agriculture in Azerbaijan, researchers such as R.J. Gahramanov (1967), E.E. Gasimov (2011), L.M. Novruzova (2010), A.Kh. Nuriyev (2004), A.A. Gurbanzada (2004), Z.N. Eminov (2008), N.A. Pashayev (2010), A.T. Zeynally (2005), E.A. Baghirov (2015), and others have written research works.

It has been noted that the region is one of the ancient human settlements. Within the territory of the economic region, the Kültepe settlement dating back 6,000 years, as well as the remains of irrigation canals from the 8th–7th centuries BC, have been discovered in the administrative districts of Sadarak and Julfa. Starting from the early Middle Ages, wars and invasions that took place in the area led to the destruction of the economy and a decline in agricultural production. However, the demand for food products and the necessity of trade consistently required the restoration of economic activity. The wars and devastation during the rule of the Sassanids (IV century) and the Arab invasion (VII century) in the region contributed to the decline of economic sectors.

In the X–XII centuries, Nakhchivan was part of local feudal states. During this relatively peaceful period, which lasted for several centuries, agriculture formed the basis of the economy. During the Mongol invasions (XIII century), cities and villages in Nakhchivan were left in ruins, and economic sectors were completely devastated.

The establishment of the Safavid state at the beginning of the 16th century once again created significant opportunities for the development of agriculture. During that period, crop farming was the leading sector.

The wars between Russia and Iran in the early XVIII and XIX centuries once again led to the collapse of the economy. After 1828, efforts toward the development and restoration of agriculture in Nakhchivan began. This situation continued until the early 20th century. The tense socio-political situation in the region, along with revolutions and the civil war, caused the disintegration of economic sectors and a decline in agricultural production. The establishment of the Nakhchivan Autonomous Soviet Socialist Republic (ASSR) in February 1924 created conditions for relative economic and political stability. The increase in agricultural production began in the 1930s with collectivization.

During the post-Second World War period of peaceful reconstruction - particularly in the 1950-60s - agriculture in the economic region was steadily developed. At the same time, the establishment of irrigation networks and reservoirs on rivers made it possible to expand cultivated land areas.

The study of the natural and geographical conditions of the Nakhchivan economic region is of particular importance from the perspective of agricultural development. The region has a distinct geography. Since its territory consists of both mountainous and lowland areas, various branches of agriculture have developed there. In the mountainous areas, livestock breeding, grain growing, and fruit cultivation are predominant, while in the lowlands, other types of crop farming are widespread. The Sharur-Ordubad lowland is the main area of settlement and agricultural activity in the economic region. The region's agro-climatic resources are also highly favorable for the development of agriculture. The high levels of solar radiation and the large number of sunny hours have a significant impact on the quality and variety of agricultural crops grown in the area.

In general, natural and geographical conditions are considered the main factor in the regional spatial organization and structural formation of agriculture.

The second chapter of the dissertation is titled **"The Role of Socio-Economic Factors in the Development and Management of Agriculture."** This section examines the main principles and socio-economic foundations of the spatial organization of agriculture in the Nakhchivan economic region. It also explores the structural changes that occurred in agriculture during the early years of independence and the role of agriculture in the employment structure of the rural population.

First, the main principles and socio-economic foundations of the spatial organization of agriculture were analyzed. The key economic factors determining the spatial organization and development of agriculture in the economic region include the allocation of financial resources and investments, the quality of land - considered one of the main factors of agriculture - water supply and the availability of favorable agro-climatic resources, provision of modern equipment and technology, connections with other sectors of the economy, and so on.

After the distribution of land to the population, significant changes occurred in the cultivation of agricultural products and in the spatial organization of farming across the region. First of all, the cultivated lands have significantly decreased, which has resulted in a reduction in the volume of harvested crops.

This not only resulted in difficulties in meeting the demand for agricultural products, but also led to the closure of enterprises based on their processing, leaving labor resources unemployed. In order to revive the previously thriving and profitable sectors of crop production that have fallen into decline, it is essential to expand cultivated areas, provide financial and technical support from the state, establish new processing enterprises, and reconstruct the existing ones.

The second section of the chapter examines the structural changes in agriculture during the early years of independence. It was

determined that, as a result of agrarian reforms during this period, there was a significant decline in sectors that had held an important place in the structure of the country's agricultural crops for many years. This process affected the development of agriculture in the Nakhchivan economic region, just as it did in other regions. Specifically, in the economic region, the reduction in cultivated areas led to a decrease in the volume of harvested products. The sectors that experienced the most severe decline included viticulture, tobacco growing, sugar beet cultivation, and others.

In 1994, the total cultivated area in the economic region decreased by more than 40%, falling to 21.2 thousand hectares. The greatest reductions were observed in the cultivation areas of industrial crops.

As a result of the well-known decisions adopted in the mid-1980s, vineyards in the economic region began to be destroyed within a short period, and grape harvests decreased drastically. In 1990, grapes were cultivated on 10.4 thousand hectares in the economic region, accounting for 5.7% of the total vineyard area (181.4 thousand hectares) across the republic.

Fruit and berry orchards underwent significant changes during the reform process that began in the early years of independence. The area of these orchards was significantly reduced, and harvest volumes declined. In their place, areas were developed for the cultivation of crops aimed at meeting domestic consumption needs and generating quick income. These crops included potatoes, melons and vegetables, as well as cereal crops.

In the early years of independence, during the process of land reforms, the areas allocated for strategic crops began to be increasingly replaced by cereal and leguminous plants. Wheat and cereal crops, being less labor-intensive, also allow for quicker harvests. Therefore, the spread of this sector on small land plots is considered advantageous in the current conditions.

In the final section of this chapter, an analysis of the "employment structure of the rural population" is provided. It has been revealed that 465.7 thousand people are settled in the

Nakhchivan economic region. Of these, 300.7 thousand people (64.6%) are rural residents. Among the rural population, 256.0 thousand people are considered employed, with 50.2% of them working in agriculture. In the administrative districts of Culfa, Ordubad, and Sadarak, this indicator even reaches 66-68% or higher. In the Shahbuz district, the level of employment in agriculture is relatively lower, standing at 42.1%.<sup>2</sup>

The third chapter of the dissertation is dedicated to the **"Current Situation of the Regional Territorial Organization of Agriculture."** In this chapter, the current state of the crop production and livestock sector structure in the Nakhchivan economic region, the changes that have occurred, the distribution of agriculture across administrative districts, and the regional internal differences are analyzed.

In the first section of this chapter, the modern sectoral structure of crop production in the Nakhchivan economic region has been examined. 3.96% of the Republic's cultivated land is located in this economic region. In 2022, crop production accounted for 65.3% of the agricultural output in the economic region.

As in all regions of the Republic, the cultivation of cereal crops occupies a leading position in the cultivated areas here as well.

In 2022, the Nakhchivan economic region accounted for 3.63% of the Republic's cereal and cereal-legume crop areas, and 3.89% of the total products harvested from these areas (Figure 1).

In the Nakhchivan economic region, wheat, barley, corn, leguminous plants, forage crops, and others are cultivated from cereals and cereal-legumes. Although wheat cultivation (59.7%) held a dominant position until 2022, in recent years, the area dedicated to forage crops (73.7%) has taken precedence.

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<sup>2</sup> Final Results of the 2019 Census of the Population of the Republic of Azerbaijan - Distribution of the Employed Population by Economic Sectors [28 Volumes] / - Baku: State Statistics Committee, Vol. 14, 2022, p.

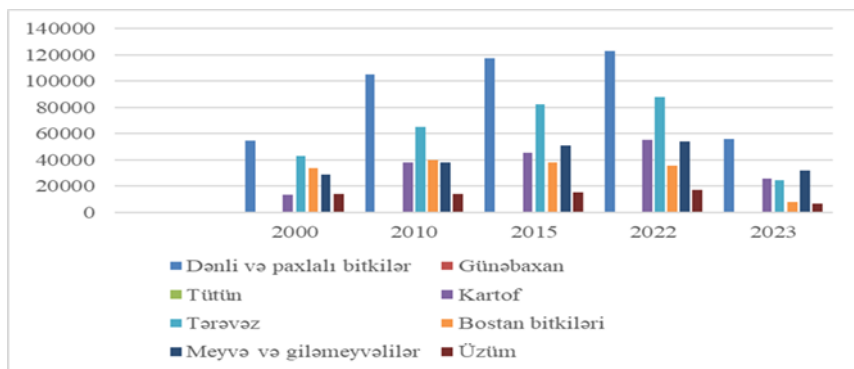


Figure 1. Agricultural Crop Production in the Economic Region, tons

The cultivation of industrial crops is one of the sectors that facilitates the establishment and operation of processing industry facilities in each region. Due to land reforms carried out during the transition period in the economic region, crops in this group experienced a decline. Although certain measures were taken in subsequent years, many problems still persist in the cultivation and production of industrial crops. Industrial crops account for 0.4% of the cultivated land in the economic region.

The economic region has favorable natural and climatic conditions, consumer potential, and processing facilities for the cultivation of melon and vegetable products. These opportunities have been widely utilized for many years. In the economic region, the area dedicated to melon and vegetable crops accounts for 17.3% of the total cultivated land, with 178.4 thousand tons of products harvested in 2022. However, in the last two years, the areas under cultivation and production in this sector have decreased by more than three times (Figure 1).

Fruit growing has historically been one of the developed sectors in the economic region. After the transition period, the area of fruit and berry orchards here has steadily expanded. Accordingly, the volume of harvested products has also increased. Fruit and berry

orchards account for 3.4% of the total cultivated land in the economic region, or 5,573.8 hectares, of which 94% are of bearing age.

In 2023, although the area of orchards in most fruit-growing sectors increased, the volume of products harvested from them significantly decreased. The total amount of harvested fruit and berry products amounted to 31.5 thousand tons, which represents a 41.4% decrease compared to the previous year.

The second section of the third chapter discusses the specialization of agriculture across administrative districts in the economic region. The varying natural-geographical conditions of the administrative districts play a significant role in their specialization in agricultural products.

In 2022, which is considered a stable period for the cultivation of agricultural crops, the economic region had 64.3 thousand hectares of cultivated land, of which 25.2% was in the Sharur and Babek districts, 15.8% in the Kangarli district, and 12.8% in the Julfa district.

Sharur, as the main agricultural district of the Nakhchivan economic region, accounted for 25.3% of the total cultivated land and 30.1% of the crop production. In this administrative district, 42% of the cultivated land is dedicated to forage crops, 20.1% to wheat, 12.6% to vegetables, and so on.<sup>3</sup> Additionally, barley, corn, legumes, sunflower, melon crops, grapes, and others are cultivated in this area. Of the total potato and vegetable production in the economic region, 44.4%, and of fruits, berries, and grapes, 32.0% come from the Sharur district (Figure 2).

In the economic region, the Babek district ranks second in terms of cultivated land (25.2%) and the products harvested from them (27.5%).

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<sup>3</sup> Agriculture of Azerbaijan 2023. Baku: State Statistics Committee, 2024, p. 701.

In this area, 70% of the cultivated land is dedicated to cereal and cereal-legume crops, of which 64% is occupied by wheat cultivation. The second largest area is allocated to vegetables and melon crops (17.8%). Additionally, potatoes, fruits and berries, grapes, sunflowers, and a small amount of tobacco are also cultivated here. Of the agricultural products produced in the administrative district, 26.9% are cereals and cereal-legumes, 30.1% are vegetables and melon crops, and so on.

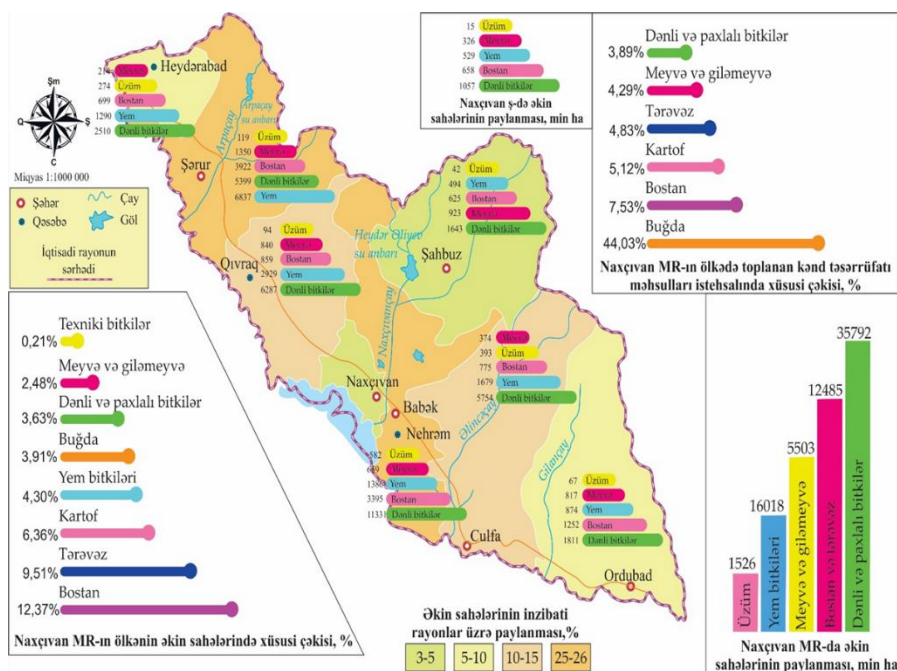


Figure 2. Agricultural Map of Nakhchivan Economic Region

15.8% of the cultivated land is located in the territory of the Kangarli administrative district, from which 11.4% of the agricultural products in the economic region are harvested. On 61.9% of the cultivated land, cereal and cereal-legume crops are grown, while 28.8% is dedicated to forage crops. Other crops

(potatoes, vegetables, melon crops, fruits and berries, grapes, etc.) occupy a smaller area.

The Julfa administrative district accounts for 12.8% of the total cultivated land and 11.0% of the agricultural production. Of the cultivated land, 70.1% is dedicated to cereal and cereal-legume crops, and 20.4% to forage crops. The remaining 9.5% of the cultivated area is used for potatoes, vegetables, melon crops, grapes, fruits and berries, and sunflower plants.

A quarter of the agricultural products produced in the administrative district consist of cereal and cereal-legume crops, 18.6% are potatoes, vegetables, and melon crops, and so on.

In the Nakhchivan economic region, the Sadarak district ranks fifth in terms of the share of cultivated land (7.0%). In Sadarak district, half of the cultivated land is dedicated to cereal and cereal-legume crops, while 28.5% is allocated to forage crops. Other crops, such as vegetables, fruits, berries, grapes, and others, are also grown. The Sadarak district accounts for 5.7% of the total agricultural production in the economic region, with approximately one-third of this production coming from cereal and cereal-legume crops.

Due to their location in the mountainous areas of the economic region, the Ordubad and Shahbuz districts cannot cover vast areas of cultivated land. In the economic region, 6.1% of the total cultivated land is in the Ordubad district, and 4.3% is in the Shahbuz district. In both districts, half of the cultivated land is dedicated to cereal and cereal-legume crops. Perennial crops are widely spread in both administrative districts. In Shahbuz district, 33.3% of the cultivated land is occupied by fruit and berry orchards, while in Ordubad district, this figure is 22.2%. These orchards mainly produce apples, apricots, walnuts, pears, peaches, cherries, and other fruits.

In the Ordubad district, 28.4% of the harvested agricultural products come from potatoes, 18.9% from vegetables, 17.3% from fruits and berries, and so on.

In the Shahbuz district, 32.3% of the agricultural products produced are fruits and berries, 25.1% are potatoes, 16.9% are cereals and cereal-legumes, and 7.7% are vegetables.

According to the natural-geographical conditions, the leading sectors of agriculture in the Babek, Kangarli, Julfa, Sharur, and Sadarak districts are cereals and cereal-legumes, vegetables, and melon crops. In Shahbuz and Ordubad districts, the primary sectors are fruits and berries, potatoes, and vegetables.

The final section of the third chapter examines the spatial organization of livestock sectors within the economic region. As in the rest of the country, in the Nakhchivan economic region, livestock activities primarily rely on private farms.

There are significant differences in the distribution of cattle in the administrative districts of the economic region. The number of livestock is primarily influenced by factors such as the area of the administrative regions, the availability of grazing land, the provision of feed, the number of rural settlements, and the population engaged in livestock farming.

The highest numbers of livestock are found in the Sharur (31.0%) and Shahbuz (19.3%) districts. The following districts in terms of livestock numbers are Julfa, Babek, and Ordubad. The smallest numbers of livestock are kept in the Sadarak and Nakhchivan city districts.

Sheep farming is one of the leading sectors of livestock farming. This sector is not only labor-efficient but also generates income in a short period and covers its costs. Additionally, the development of the sector and the increase in the number of sheep require permanent pastures that can be used year-round. The development of sheep farming in the economic region has steadily increased since 2000, and by 2022, there were 747.7 thousand sheep and goats in the region.

Due to the large number of sheep and goats, the Babek (20.1%), Sharur (18.2%), and Shahbuz (17.1%) districts stand out.

Poultry farming is also considered one of the developed sectors of livestock in the economic region. It mainly serves to meet the population's demand for meat and eggs. This sector allows for the production of inexpensive products in a short amount of time.

In 2022, considered a period of stable development for agriculture, 1,497.7 thousand chickens were kept in the region. Over the last 20 years of independence, this sector has been consistently developed, with the establishment of Broiler-Poultry Complexes for animal housing, resulting in an increase in the number of livestock and an improvement in the population's access to products from this sector.

Due to the large number of poultry, the Babek (22.8%), Sharur (17.4%), Culfa (15.2%), and Ordubad (14.3%) districts stand out.

The livestock products obtained from the three sectors mentioned above not only meet the internal demand of the economic region but are also sent to other regions of the country. The main livestock products are meat and milk. In 2022, 17.4 thousand tons of meat and nearly 90.0 thousand tons of milk were produced.

From 2000 to 2022, the production of livestock products has continuously increased. This growth was observed as a 1.7-fold increase in milk production, a 3.3-fold increase in meat production, and a 2-fold increase in wool and egg production (Figure 3).

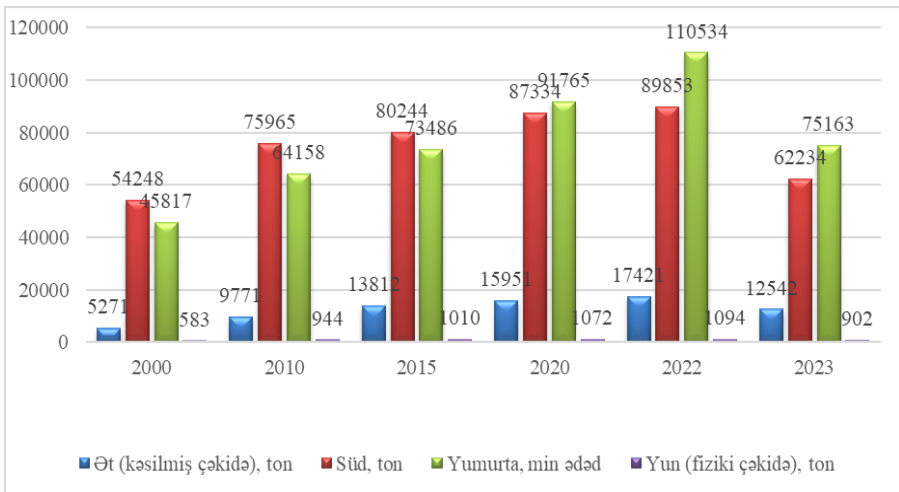


Figure 3. Production of livestock products.

The Nakhchivan economic region is favorable for the development of beekeeping. The number of bee colonies and the volume of the main product, honey, have been steadily increasing. Beekeeping has primarily been developed in the Shahbuz, Ordubad, and Culfa districts. Shahbuz district ranks first in honey production (420 tons).

The fourth chapter of the dissertation is titled **"Directions for Improving the Structure and Management of Agriculture in the Region."** In this chapter, the main directions for the efficient territorial organization of agriculture, the role of State Programs in the organization and development of agriculture, as well as issues related to the improvement of the regional agricultural structure, are examined.

In the first section of this chapter, the main directions for the efficient territorial organization of agriculture in the economic region are discussed. It is noted that agriculture in the Nakhchivan economic region not only plays a leading role in providing food products for the population but also plays an important role in the development of villages and serves as the economic base for these areas. There are significant potential opportunities for the development of agriculture in the economic region. These include natural and climatic conditions, including high agro-climatic resources, fertile soils, water resources, and others.

In the process of determining the future directions for agricultural development, factors such as the number of consumers, the labor habits of the rural population, and export opportunities must be taken into account. At the same time, the activities of light and food industry enterprises within the agro-industrial complex (AIC) and the creation of new ones increase the demand for agricultural products. Therefore, it is crucial to increase the production of strategic products that meet the demand of these industrial enterprises.

Since crop production in the economic region is only possible under irrigation conditions, establishing irrigation systems is vital for increasing productivity in agricultural development. Considering the

limited water resources, it is necessary to ensure the efficient use of irrigation water and to apply methods such as drip irrigation and spraying. Additionally, the creation of supply points, storage chambers, and warehouses for storing produced goods and raw materials, as well as providing the material and technical base, including mineral fertilizers and pest control measures, is also required.

Since the early years of independence, the agricultural reform process has significantly altered the sectoral structure of agriculture. As a result, cereal and leguminous crops now occupy a leading position in the structure of cultivated land. However, certain problems still persist in this area, including the adherence to agro-technical standards in cultivation, the proper use of mineral fertilizers according to established guidelines, ensuring the provision of material and technical resources, reducing losses during harvest, creating infrastructure for storage, and other related issues.

There are significant problems in the cultivation of technical crops in the economic region. Among them, difficulties in the cultivation of sugar beet are particularly pronounced. To restore sugar beet cultivation, it is essential to first establish processing facilities. The economic region has favorable natural-climatic conditions and land resources for growing sugar beets. Additionally, there are significant export opportunities for the products obtained.

Melon and vegetable crops, as well as fruit growing, hold an important place in the structure of agriculture. These crops have been grown on large areas for many years and have been exported to other regions of the country in addition to satisfying domestic demand. Favorable natural-climatic conditions and the labor habits of the population indicate that these sectors have great potential for development.

One of the leading sectors of agriculture, the demand for livestock products is constantly increasing. The growth of the population, the establishment of processing enterprises, the increase in the capacity of existing facilities, and the expansion of export opportunities for these products all require an increase in their

production. However, the measures taken so far cannot be considered sufficient.

An important aspect of the development of animal husbandry is the creation of specialized farms, the organization of veterinary services in these farms, and the implementation of measures to prevent the spread of diseases among animals.

In the second section of the fourth chapter, the role of State Programs in the territorial organization and development of agriculture is analyzed.

To support the economic reforms in the country, the "State Programs for the Socio-Economic Development of Regions" have been developed and implemented to establish the legislative framework and coordinate the ongoing measures. These programs play a crucial role in the restoration of production and infrastructure facilities in the regions, the construction of new ones, the recovery of agricultural sectors, and the expansion of cultivated areas.

Under the first State Program (2004-2008), significant efforts were made to develop agriculture in the Nakhchivan economic region. These included the construction of greenhouse complexes, the building of Vaykhir water reservoirs, the establishment of "Nakhchivan Agrar Leasing" OJSC and "Gamigaya Fruit Products Complex" LLC, the expansion of livestock, beekeeping, grain farming, potato farming, horticulture, and viticulture, the development of livestock complexes, and the creation of forage production areas for livestock.

During the second State Program (2009-2013), the area of fruit orchards and vineyards was expanded, a poultry complex was developed, 10 fishing farms were established in 5 administrative districts, and important steps were taken to provide farmers with machinery and equipment.

During the third and fourth State Programs (2014-2018 and 2019-2023), significant measures were taken in the agricultural sector, including the organization of insurance in agriculture, the establishment of new livestock complexes, and other related initiatives.

Additionally, the "State Program for Stimulating the Production, Processing, and Export of Agricultural Products in the Nakhchivan Autonomous Republic for 2021-2025" and the "State Program for the Socio-Economic Development of the Nakhchivan Autonomous Republic for 2023-2027" were adopted. These programs outline the key steps to be taken for the development of agriculture, among other issues.

In the final section of the fourth chapter, issues related to the improvement of the regional structure of agriculture were analyzed. The importance of management in solving the problems of effectively forming the regional structure of agriculture was emphasized. Given the numerous and complex problems in agriculture, changes in the functions of management, its characteristics, principles, and other aspects were studied. It was found that the management of agriculture refers to ensuring efficient and sustainable development in crop production and livestock sectors. Additionally, the regional management model of agriculture is noted for developing the agricultural potential of the economic and administrative districts, regulating the efficient use of natural resources, and addressing the discrepancies within the sector.

## **CONCLUSION AND RECOMMENDATIONS**

1. In the Nakhchivan economic region, various sectors of agriculture, including territorial organization, have been extensively studied since the second half of the 20th century. During this period, numerous scientific works related to agriculture were published. Starting from the early 21st century, agriculture in the economic region has been studied as an independent research subject. There is a need for continuous research to expand efforts in the region, with a focus on specialization in agriculture and the development of more profitable sectors.

2. In the economic region, the historical characteristics and natural-geographical conditions for the formation of agricultural

territorial organization and structure have been studied. As a result of the research, it has been noted that the region, in addition to being an ancient settlement area, possesses favorable natural-geographical conditions for the development of agriculture. Specifically, the hot and dry climate helps the cultivation of heat-loving plants, forming them as specialized crops. However, due to the blockade conditions and the implementation of land reforms, the natural-geographical conditions do not fully enable the cultivation of crops that the environment allows. Although there are sufficient potential opportunities in the economic region to develop sectors such as tobacco farming, viticulture, and fruit growing, the small size of the land plots creates difficulties in their effective utilization. Due to the limited water resources, it is crucial to focus on drought-resistant farming areas and the establishment of greenhouse farms [15].

3. During the early stages of agrarian reforms (transition period), as in all regions, the agricultural sectors in the Nakhchivan economic region also experienced a decline. Particularly, the privatization of lands and their distribution among the rural population accelerated this process. During this time, peasant-farmer households were formed with no financial-technical, personnel potential, or technical support. Agricultural sectors of strategic importance, such as vineyards, tobacco, and sugar beet cultivation, as well as sericulture, completely declined, while significant setbacks occurred in fruit growing and potato farming. Instead, a new structure oriented toward domestic consumption was formed, which does not fully meet internal demand.

4. In the Nakhchivan economic region, family-based peasant-farmer households with small land holdings play a significant role in the territorial organization of agriculture. Considering the natural-geographical conditions, the principle of cultivating agricultural crops based on maximizing profits is not applied in the region. The distribution of lands, their fragmented use, and the lack of regular principles in crop cultivation lead to significant challenges in agricultural organization. As a result, the majority of the products produced are used to meet domestic demand [1].

5. The analysis of the current situation of agricultural production allows for the identification of the direction and efficiency of structural changes, as well as the factors causing these changes. The analysis of the current state of the agricultural production structure shows that the main leading sectors in the economic region include cereals and leguminous crops, melon and vegetable crops, fruits and berries (especially apples, apricots, and grapes), large and small ruminants, poultry farming, beekeeping, and others [36].

6. The geographical-territorial asymmetry of the economic region and the differential development levels of its regions create problems in forming effective directions for the agricultural production structure. These problems include the irrational distribution of resources, the limitation of investment flows, inefficient use of resource potential, and the inefficiency of the results of reproduction. In this regard, the more efficient formation of the regional agricultural structure requires state support for stimulating new production directions, providing direct financial assistance, promoting exports, and insuring against uncertainties and risks, among other important issues.

7. The analysis of the employment structure of the rural population in the Nakhchivan economic region shows that the majority of the population in the administrative districts is made up of rural residents. Given that agriculture plays a leading role in the employment of the rural population, expanding and ensuring the sustainable development of this sector is considered crucial. As in all other regions, the implementation of measures outlined in the adopted State programs in the Nakhchivan economic region has played an important role in the sustainable development of agriculture. As a result, the effectiveness of regional management activities is directly linked to the efficiency of the development of the regional socio-economic system. Therefore, modern management systems must be improved not only through their own development but also through the optimization of the functioning of the management object - the regional economy [8].

## **The content of the research work is reflected in the author's following articles**

1. Hasanov I.G. Efficient Use of Land Resources in the Nakhchivan Autonomous Republic under Modern Conditions // Materials of the scientific conference on the theme "Human and Environmental Relations", dedicated to the 110th anniversary of academician H.A. Aliyev's birth, Proceedings of the Azerbaijan Geographical Society, - Baku: Avropa, - 2017, Vol. XX, - pp. 20–24. (Co-author: A.M. Hasanov, A.F. Novruzova.).

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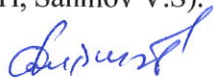
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