REPUBLIC OF AZERBAIJAN

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ABSTRACT

Of the dissertation for the degree of Doctor of Philosophy

PROSPECTS FOR THE DEVELOPMENT OF THE TEA INDUSTRY IN THE REPUBLIC OF AZERBAIJAN WITHIN THE FRAMEWORK OF A CLUSTER-BASED MODEL

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Field of Science:	Economics
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BAKU - 2025

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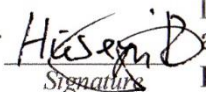**Yashar Atakishi oghlu Kalbiyev**

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GENERAL CHARACTERISTICS OF THE STUDY

Relevance of the Topic and Degree of Elaboration. The necessity to improve the system of socio-economic relations aimed at the development of the agricultural potential of the regions sets an important task before economic science — to identify optimal forms of mutually beneficial cooperation between state and business structures. Under these conditions, the most relevant form of organizing the economic space of Azerbaijan's regions is reflected in the long-term socio-economic development concept of the country, designed for the period up to 2026. This concept emphasizes the cluster approach as the core model for regional development, aiming to foster cooperation between economic agents and market participants, characterized by mutual trust, commitment, shared benefits, and successful joint competition.

The experience of economically advanced countries with established global clusters demonstrates that the use of a cluster-based approach as an instrument of economic and spatial development enables the rationalization of regional geography and enhances the significance of convergence processes. Since 2012, the government of Azerbaijan has been implementing a cluster policy as an element of regional development. It has initiated the identification and stimulation of cluster development, including the provision of subsidies for the implementation of their development programs.

Currently, six agricultural clusters in various fields receive state support in Azerbaijan, and the process of establishing and shaping clusters in other sectors and regions is ongoing. At the same time, it should be noted that the formation of clusters across regions is not uniform. It is shaped by diverse economic-geographical, social, ecological, demographic, cultural, and other factors, each with its own specific characteristics. This, in turn, indicates the need for the development of multi-stage methodologies and the integration of heterogeneous indicators in the cluster formation process.

The relevance of the research topic lies in the necessity to implement the ideas of cluster development in Azerbaijan within the framework of state support as a key component of the comprehensive development of the

country's regional geographic space. It also stems from the need to improve the processes and mechanisms of cluster formation. All these considerations will contribute to the expansion of regional governance practices based on the formation and modernization of clusters and will enhance the level of state participation in their development processes.

Issues related to cluster-based economic development and the enhancement of regional spatial organization occupy a significant place in the research of both Azerbaijani and international scholars. Substantial contributions to the development of regional specialization theory and the study of economies of scale have been made by foreign economists such as **A. Smith, D. Ricardo, E. Heckscher, B. Ohlin, J. Thünen, A. Weber, V. Christaller, A. Marshall,** and **J. Becattini**. Furthermore, the clusterization of the economy and cluster policy have been extensively addressed in Western economic literature through the works of **E. Dahmén, P. Krugman, E. Lämmer, D. Maillat, M. Porter, P. Hertog, M. Enright**, among others.

In Russia, significant scientific contributions have been made to the formation and evaluation of cluster policy efficiency by researchers such as **L.S. Markova, Y.V. Ryabchenyuk, L.N. Chaynikova,** and **A.G. Shestopalov**. Likewise, issues concerning the state regulation of cluster development in regions and the methodological aspects of assessing cluster potential have been addressed in the works of scholars including **V.L. Belousova, D.G. Voronova**, and **T.V. Mirolyubova**, who have achieved notable results in this area.

In Azerbaijani economic scholarship, the application potential of the cluster approach in the formation and restructuring of regional space has been reflected in the works of scholars such as **A.H. Nuriyev, A.A. Nadirov, T.B. Huseynov, Z.A. Samadzadeh, S.K. Huseynov, I.H. Aliyev, A.G. Alirzayev, T.N. Aliyev, I.G. Soltanli, V.B. Karimli, S.S. Samandarov, H.A. Khalilov, R.A. Balayev, S.V. Salahov, R.P. Sultanova**, and others.

While recognizing the diversity of theoretical approaches and applied studies related to certain aspects of the topic, it is important to emphasize the current scientific demand for investigating the cluster dimensions of modernizing the economic space of Azerbaijan's regions. The scope and depth of the identified problem, its relevance, and growing practical

significance have all defined the choice of the research topic, its objectives and tasks, as well as the subject and object of the study.

Object of the Research. The object of the research is clusters, viewed as dynamic systems of organizational and economic relations formed in tea production with the support of state policy.

Subject of the Research. The subject of the research is the formation and modernization of regional economic clusters in tea cultivation as a component of cluster policy, and the investigation of opportunities for the development of management strategies and provision of state support in this context.

Aim of the Research. The aim of the research is to theoretically substantiate and develop methodological approaches for the formation and modernization of regional clusters through the utilization of state support mechanisms.

To achieve this aim, the following research objectives have been defined:

- To analyze and systematize the organizational structure of cluster management in the regions of Azerbaijan;
- To develop and test a methodology for the analysis and evaluation of cluster performance in the regional economy;
- To assess the outcomes of clustering economic activities in the regions of Azerbaijan based on the key parameters of cluster development programs;
- To identify the prospects for expanding the geographical presence of clusters in Azerbaijani regions using self-organizing feature maps;
- To propose and justify an algorithm for improving clusters by considering the sectoral orientation of their development.

 Research Methods. The study employs various research methods including economic-mathematical modeling, comparative analysis, graphical representation, systematization, statistical analysis, retrospective and categorical approaches, factorial analysis, system and cluster analysis, as well as modeling and forecasting techniques.

Main Provisions Submitted for Defense

1. It is asserted that the positive dynamics of key regional indicators can be further enhanced by the presence of clusters within the territory.

2. There exist specific cluster mechanisms linked to the fact that the emergence of clusters is a significant factor in regional economic development.
3. A comparative analysis of theoretical approaches to cluster formation in regional economies has revealed that the fundamental condition enabling the study of the general principles of cluster formation and the identification of cluster potential is state support.
4. A key component in the development of a cluster management concept is the identification of distinguishing criteria for cluster identification.
5. It has been established that within the regional organizational structure of cluster governance, internal self-governance is carried out by the cluster members themselves.
6. The successful functioning of regional cluster management is more effectively achieved when the development of interrelations is integrated with the comprehensive development of the territories in which clusters operate, through enhanced cooperation among stakeholders involved in cluster formation, and supported by engineering infrastructure and social protection mechanisms.
7. Mechanisms of cluster formation as observed in global practice should be examined, with particular attention given to the most essential and effective ones.
8. There is a need to develop a methodology for analyzing and evaluating the performance of clusters in the regional economy, taking into account the key parameters proposed for assessing the prospects of the cluster approach in tea production in the Lankaran-Astara region of Azerbaijan.
9. Azerbaijan is interested in the innovative development of the tea industry in the Lankaran-Astara region and highly values the role of agricultural clusters in this process—particularly in creating new jobs, enhancing the competitiveness of tea products, and increasing foreign currency inflows to the country.
10. The algorithm for the formation of regional clusters proves to be more effective in relation to the sectoral and corporate forms of economic activity, due to a number of unique characteristics inherent to the spatial organization of the economy.

11. It is considered appropriate to identify and improve the mechanisms of state stimulation for the development of the agrarian sector—particularly tea production—based on a cluster approach.

Scientific Novelty of the Research

- Based on the analysis of key stakeholders involved in the long-term cluster process, an organizational structure for the management of tea clusters reflecting modern characteristics has been developed, and interrelations among stakeholders have been defined.
- Drawing on international experience in the formation and development of regional clusters, the factors enabling and hindering the establishment of tea clusters in Azerbaijan have been systematized.
- A methodology for analyzing and evaluating the performance of tea clusters in the regional economy has been proposed, structured around five key directions: analysis of state programs, the formation of cluster development, risk scenarios, and the analysis of the sectoral potential of agricultural enterprises and clusters.
- Utilizing the author's approach derived from studies of cluster development programs, and employing a traffic light matrix ranking method that enables synchronization, medium-term (until 2026) and long-term (until 2030) cluster development forecasts have been formulated. These forecasts are aligned with national development strategies and based on risk and scoring analyses to support the advancement of regional clusters.
- Enterprises in Azerbaijani regions with the potential to form future clusters have been identified. The cluster potential of the regions has been assessed using feature maps to determine the spatial concentration and suitability of these enterprises.

Theoretical and Practical Significance of the Research. **Theoretical Significance.** The theoretical significance of the research lies in the development and integration of methodological recommendations for the formation and modernization of regional economic clusters in tea production, with the support of state policy.

Practical Significance. The practical significance of the research is reflected in the potential use of its methods and recommendations by state authorities in the preparation of cluster development programs for tea

production in Azerbaijani regions, as well as in the formulation and implementation of regional economic growth concepts and strategies.

Economic Efficiency of the Research Findings. The economic benefits of utilizing the research results include the rationalization of the use of the geographic space of regions due to the formation of clusters in tea production, a reduction in the time required for the implementation of cluster programs, and an increase in the scale of clusters with state support for both the clusters and the regions.

The results of this dissertation research can be applied in scientific and educational processes at higher educational institutions and can also contribute to the formulation of socio-economic development strategies by regional governmental bodies for Azerbaijan's foundational institutions.

Validation and Application of the Research Work. The main findings and practical proposals of the dissertation have been presented and validated through various scientific and practical forums. These include:

- **The Historical Development and Traditions of Tea Cultivation in Azerbaijan**, published in the *Scientific News Journal of Azerbaijan State University of Economics*, 2019.
- **The Role and Importance of Cluster Policy in Regional Development**, in the proceedings of the International Scientific-Practical Conference dedicated to the 97th anniversary of the birth of National Leader Heydar Aliyev, AHIK, AƏSMA, 2020, Baku.
- **The Characteristics of the Value Proposition of David Tea in Foreign Markets**, published in *Labour and Social Relations Scientific-Practical Journal*, 2021.
- **The Activities of "David's Tea" Company and the Characteristics of Value Proposition Formation**, in the proceedings of the International Scientific-Practical Conference dedicated to the 98th anniversary of the birth of National Leader Heydar Aliyev, AHIK, AƏSMA, 2021, Baku.
- **State Support and Directions for the Improvement of Tea Cultivation in Azerbaijan**, published in *Scientific-Practical Journal of Economics and Management in Construction*, 2021.
- **Global Experience in the Development of Tea Clusters**, published in *Labour and Social Relations Scientific-Practical Journal*, 2021.

- **Comparative Analysis of Economic Indicators in the Tea Sector of Azerbaijan and Georgia**, published in *RS Global Journals: International Journal of Innovative Technologies in Economy* (p-ISSN 2412-8368, e-ISSN 2414-1305), 9 December 2021, RS Global Sp. z O.O., Poland.
- **Cluster Strategy for Regional Development: Nature, Advantages, and Institutional Support Experiences** presented at the *International Tea Congress* on the industrial, cultural, and economic dimensions, 13-15 May 2022, Lankaran, Azerbaijan, Lenkeran State University.
- **Impact of COVID-19 on Tea Plantations and Tea Production Dynamics in Azerbaijan**, presented at the I International Social Sciences Conference, AƏSMA, 2021, Baku.
- **The Role of the Food Industry in Ensuring Food Security in Azerbaijan**, published in *Labour and Social Relations Scientific-Practical Journal*, 2023, No. 2 (20).
- **Enhancing the State's Role in Cluster-Based Tea Development**, presented at the *International Scientific Conference on Transforming Economics for Sustainability*, Dunaujvaros University, Hungary, 25-26 March 2024, pp. 49-58.
- **The Role of the State in the Development of the Tea Sector in Azerbaijan**, presented at the *4th International Bosphorus Scientific Research Congress*, Istanbul, Turkey, 27-28 April 2024, pp. 442-447.

The results, main conclusions, and substantiated proposals and recommendations of the dissertation have been presented and approved in 12 articles published in domestic and international journals and conferences.

The institution where the dissertation was carried out: Odlar Yurdu University.

The volume of the dissertation, with the individual sections specified: The dissertation consists of an introduction (12,792 characters), three chapters (Chapter I – 96,812 characters, Chapter II – 61,503 characters, Chapter III – 58,168 characters), including 9 paragraphs, a conclusion (7,129 characters), and a bibliography list with more than 100 sources. The main text is 155 pages, covering a total of 225,741 characters, and includes 23 tables, 29 figures, 12 diagrams, and 9 graphs.

TABLE OF CONTENTS OF THE DISSERTATION

MAIN THESIS DEFENDED

In the introduction of the dissertation, the relevance of the topic is substantiated, the level of research, the subject, objectives, and tasks are determined, and the theoretical and methodological framework, scientific novelty, and practical significance of the work are highlighted.

1. It is argued that the positive dynamics of the main indicators of the region can be further strengthened by the presence of clusters in the area.

Based on the principles of the market economy, Azerbaijan has made it a priority to develop its economy on the basis of its national values, and effective use of the potential of the agricultural sector has become one of the key issues based on the "Vision for the Future" development concept. In this regard, state support for the development of agricultural sector clusters is essential and covers various multidimensional issues. Naturally, ensuring high productivity, increasing the competitiveness of local products and goods, properly identifying and developing key income sectors of the agricultural sector, and organizing more efficient and modern forms of state support for rural farms reflect important aspects of the state policy in the agricultural sector. Thanks to direct state support for the development of the agricultural sector, clusters are being formed in the regions with the allocation of funds by the state, infrastructure is being created, and investments are being directed to these areas.

The importance of establishing clusters in economic spheres in Azerbaijan is also highlighted as one of the priority directions in the "Strategic Roadmap for the National Economy and Key Sectors" document. In addition, the Strategic Roadmap for the Production and Processing of Agricultural Products in the Republic of Azerbaijan, as well as the additional measures concerning the development of citrus fruits, tea, and rice production in the southern region, based on the Presidential Decree No. 3227 dated September 12, 2017, related to the development of tea farming in Azerbaijan, aim to increase state support for the innovative development of tea farming, utilize the available resources and potential of the sector effectively, improve the competitiveness of the economy, and enhance the social status and material well-being of the

population in these areas, while also increasing interest in tea processing and production.

2. There are specific cluster mechanisms associated with the fact that the formation of clusters is an important factor in regional economics.

In modern economic literature, there remain numerous different approaches and opinions regarding the content and essence of a cluster, its scope, organization and management, as well as its formation mechanism and development. The essence of clustering fully reveals its relationship with the etymology of the word. Specifically, the core of the word—"to cluster"—refers to the unification of several similar elements that possess specific characteristics and can be regarded as a single organism. This refers to the formation and development of entrepreneurial entities that are considered homogeneous in terms of their core activities.

In all interpretations of clustering, there is a single common characteristic—the idea of a group that is isolated from a larger population by one or more shared features. The term "cluster" (from the English word cluster, meaning group, community, or gathering) refers to an independent economic unit that combines several similar elements and possesses specific characteristics.

The definition of a cluster, and its essence, is based on the close mutually beneficial cooperation relationships between the organizations participating in the cluster and the mechanism for organizing inter-cluster partnerships outside of it. The most important component of such relationships is the presence of necessary and sufficiently initial conditions that create a favorable environment for the future formation of the cluster. Thus, the relationships established within the framework of cluster cooperation are based on the principles of scientific research and production partnerships, as well as the implementation of joint projects for the development of the cluster.

3. The comparative analysis of theoretical views on the creation of clusters in regional economics has shown that the key condition for studying the general foundations of cluster formation and uncovering the potential for cluster creation is state support.

The analysis of the theory of cluster evolution allows us to determine that, while in the 19th century, historically formed industrial

complexes were viewed as the centers of regional and national economic development within the framework of industrial approaches, from the late 20th century onwards, economic theory began to study clusters from the perspective of competition theory. Special attention was given to the increase in competitiveness and innovative activity, as well as the role of the state in the processes of cluster formation. The stages of cluster evolution can be divided into the following three phases that reflect the role of the state in their development:

• **Stage I: Late 18th century - Early 19th century.** This stage is characterized by the organization of production in cluster forms (artisanal production), the division of labor, and the emergence of production cooperation (A. Smith, D. Ricardo, E. Heckscher, B. Ohlin). At the same time, this period is marked by the support of economic liberalism ideas with minimal state participation in the economy and the maintenance of previously created production unions, with the belief that only private entrepreneurship is capable of overcoming the economic crisis, ensuring economic growth, and raising the welfare of the population.

• **Stage II: Late 19th century - Early 20th century.** This stage is marked by the development of the theoretical foundations for the formation of classical clusters, based on the resource base (A. Marshall, L. Walras, J. Keynes).

• **Stage III: Early 20th century - 21st century.** The modern era, which is associated with the development of economic thought related to the formation of cluster theory and the content of the cluster concept, as well as its practical implementation (Western economists: M. Porter, E. Dahmen, E. Limer, M. Enright, P. Krugman, P. Hertog, etc.; Russian economists: M. K. Bandman, G. Yu. Gagarina, K. V. Ekimova, G. M. Zinčuk, N. N. Kolosovski, A. G. Polyakova, L. N. Chaynikova, etc.).

By systematizing the scientific ideas related to the formation of clusters, it can be concluded that these theories are based on the cluster approach, which is an innovative form of modernizing the regional economy. This approach stimulates the exchange of knowledge, mutual interaction, and networking between large and small business entities, enabling national industries to develop and maintain their competitive advantages.

4. The development of the concept of cluster management involves identifying distinguishing criteria for cluster identification as a key component.

The formation of the cluster management concept allows economists' scientific thoughts to be divided into two groups:

• **The first group** forms with definitions that focus on geographic concentration or territorial placement. Here, the cluster concept is considered as territorial cooperation within neighboring sectors that are interconnected to increase collective competitiveness. Geographic concentration has been the central idea of the cluster in the studies of G. Schmitz (1992), S. Rosenfeld (1997), M. Preveser, D. Stout (1998), M. Porter (1998), E. Bergman, E. Feser (1999), Y.N. Drenev (2001), S.I. Sokolenko (2002), and N.V. Sedova (2013).

• **The second group** involves not only firms but also other organizations (industrial hubs, production chains, localized networks) that combine their resources and core competencies, as well as interorganizational interactions within sectors. The cluster concept is usually interpreted as a set of sectors defined at a high aggregation level. The core of the cluster is formed by production cycles that are closely connected with each other (for example, the chain of connections in the cluster among the participants of the triple spiral concept: government – business – scientific association). The research of economists such as M. Porter (1990), P. Hertog (1999), J. Sennett (1999), T.V. Tsikhan (2003), and V.M. Kutyin (2003) falls under this group.

Thus, the key definitions of the cluster concept identified in the study have made it possible to systematize the scientific thoughts of economists about its essence.

A historical review of local and global practices of clustering in economics revealed several criteria used to describe the spatial development of industries and enterprises, as well as their geographical concentration in a certain area, which help distinguish the cluster from similar structures (Figure 1).
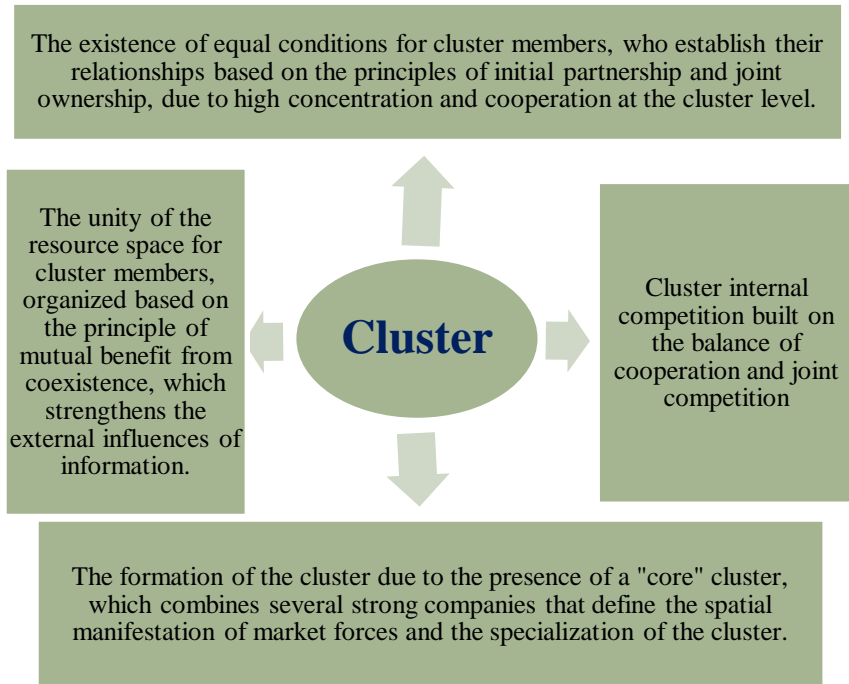
The existence of equal conditions for cluster members, who establish their relationships based on the principles of initial partnership and joint ownership, due to high concentration and cooperation at the cluster level.

The unity of the resource space for cluster members, organized based on the principle of mutual benefit from coexistence, which strengthens the external influences of information.

Cluster

Cluster internal competition built on the balance of cooperation and joint competition

The formation of the cluster due to the presence of a "core" cluster, which combines several strong companies that define the spatial manifestation of market forces and the specialization of the cluster.

Figure 1. Criteria for Cluster Identification

The main characteristic of clusters is the possibility of their creation through the spatial determination of the region's market potential. A cluster takes into account the existing market mechanism as much as possible, and the enterprises themselves (to increase profitability, improve the quality of goods and services, etc.) become effective only when there is a necessity to join the cluster.

5. The internal self-management of the cluster by its members has been identified as an essential component in the regional organizational structure of cluster management.

In the regional organizational structure of cluster management, internal self-management is carried out by the following cluster members:

• System-forming enterprises, which define the specialization of the cluster, are responsible for efficient production, the dissemination of knowledge, and technologies within the cluster. The development of

intra-cluster relations contributes to the formation of clusters of small and medium enterprises, scientific institutions concentrated alongside large organizations, and the application of progressive production methods.

- Scientific-research institutions, including scientific organizations and educational institutions (universities, colleges, research institutes), are involved in the implementation of cluster programs. This includes the formation of high-tech start-ups by graduates, realization of the educational and scientific potential of the country's regions, enhancing competitive advantages, building and increasing competitive personnel potential, and advancing scientific research in promising fields, especially in the launch of high-tech industries.
- Engineering centers presented as legal entities in any cluster where the founders are government entities and local authorities. These centers focus on the commercialization of existing scientific research activities by applying scientific work in industry.
- The infrastructure sector, including social infrastructure objects in healthcare, culture, education, etc., and transportation systems, freight handling, communication, etc., along with engineering networks. The formation of clusters in market infrastructure, such as audit, insurance, leasing, and consulting, is also a part of this structure.
- Small and medium-sized enterprises, particularly those with horizontal and vertical relationships with large companies, organizations, as well as competing entities, suppliers of raw materials, products, equipment, complex goods, contractors, service providers (e.g., consulting, legal services), and organizations with similar technologies and production factors.
- Financial institutions, including credit organizations: state and commercial banks, investment funds, venture capital funds, and large firms engaged in direct investment.
- Representatives of the public sector, including public organizations, mass media, business associations, socially oriented non-commercial organizations, chambers of commerce and industry, network organizations, cluster organizations, etc.

Thus, the research concludes that the specific composition and number of cluster members are directly dependent on its operational directions as well as the sectorial structure of its core.

It is worth noting that, in general, within the organizational structure of cluster management in the region, vertical and horizontal interrelations and technological cooperation relationships are formed among the cluster members.

6. The successful operation of regional cluster management can be more effectively implemented when the development of relations is combined with the support of engineering infrastructure and social protection, especially in the realization of the comprehensive development of the areas in which the clusters are located, and the improvement of relations among the stakeholders involved in the formation of clusters.

Based on the analysis of the key stakeholders involved in the long-term process, we have formulated an organizational structure for cluster management in the regions of Azerbaijan, which reflects modern features. The interactions between these stakeholders have been identified as part of this process.

This management structure compiles information on the organization of cluster management in Azerbaijan's regions. It focuses on the resources of scientific and educational institutions, engineering centers, and small and medium-sized enterprises as interconnected elements of cluster stakeholders. By doing so, it stimulates the sectoral development of the region and facilitates increased state support for the organizations located within the region.

7. The mechanisms of cluster formation in global practice should be examined, and the most important ones should be given particular attention.

Typically, researchers distinguish three main cluster models in the global economy: North American, Western European, and Asian models. Each of these models has its own unique characteristics of formation and development. This geographic typology of cluster models in the world economy is mainly conditioned by the following factors: the isolated development of these mega-regions over a long period of time; the established and sufficiently stable characteristics of the cluster processes;

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the different provision of strategically important natural resources; the varying capacities of national and regional markets; the sectoral structure of industry; and the role and place of the state in economic regulation.

8. To assess the prospects of the cluster approach in tea cultivation in the Lankaran-Astara region of Azerbaijan, it is necessary to develop a methodology for analyzing and evaluating the performance of clusters in regional economics, taking into account the key parameters of the proposed development.

During the research, a methodology for the analysis and evaluation of cluster performance in regional economics was developed, considering the key parameters of the proposed development to assess the prospects of the cluster approach in Azerbaijan's regions.

The methodology includes the following:
1. Analysis of the outcomes of the implementation of development programs and cluster policies (using the example of the Lankaran-Astara economic region of the Republic of Azerbaijan).
2. Analysis of the economic integration effect from the overall performance of state-supported clusters in economic regions.
3. Analysis of the potential sectors and risks of cluster development in the medium and long term.
4. Analysis using the self-organizing feature maps method for industrial enterprises across regions in Azerbaijan.
5. Analysis of the sectoral potential of clusters and forecasting the prospects for their modernization through the creation of cognitive clusters.

Based on the analysis results and selected parameters, the level of agricultural development in a specific region relative to the entire country is determined. This may lead to the necessity of either promoting cluster development to enhance competitiveness and productivity or justifying the impracticality of cluster formation in a particular region due to the lack of potential or initial conditions for its development. The proposed procedure for cluster evaluation takes into account the functioning of market mechanisms and helps ensure that the cluster development process occurs naturally and with minimal costs for stakeholders.

9. The innovative development of the tea industry in the Lankaran-Astara region of Azerbaijan is of particular interest, as the role of

agricultural clusters in this sector is highly appreciated both in terms of creating new jobs, enhancing the competitiveness of tea products, and increasing the country's foreign exchange earnings. One of the priority sectors in the development of agriculture in the country is tea cultivation. Among the essential elements for human survival and well-being, water is considered the most vital. After water, tea is the most popular beverage for humans. It is therefore no coincidence that it is estimated that nearly 3 billion cups of various kinds of tea are consumed daily worldwide. In this context, it cannot be doubted that the tea industry in every country develops rapidly, generates substantial income, and consistently occupies an essential position in the consumption diet. To conduct a statistical study of the tea market in the country, it is necessary to first examine the dynamics of tea cultivation areas, one of the key indicators. The table below presents the area of tea plantations in the country from 2010 to 2022 (Table 1).

Table 1. Area of Tea Plantations in Economic Regions (ha)

Economic regions	2010	2015	2016	2017	2018	2019	2020	2021	2022
Azerbaijan Republic	587.0	1009.0	1016.0	1114.3	1136.5	1082.0	1067.2	996.2	977.2
Lankaran-Astara Economic Region	527.0	949.0	956.0	1054.3	1076.5	1022.0	1007.2	936.2	917.2
Astara District	195.0	343.0	345.0	345.0	345.0	272.5	272.5	231.5	231.5
Lankaran District	327.0	566.0	568.0	604.3	628.5	640.5	604.3	571.8	552.8
Lerik District									
Masalli District	5.0	40.0	43.0	105.0	103.0	109.0	130.4	132.9	132.9
Sheki-Zagatala Economic Region	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Zagatala District	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0

Source: Prepared by the author based on the data from the State Statistical Committee (SSC).

As seen from the data in Table 1, there has been an increase in the area of tea cultivation across the country since 2010. Additionally, in 2017, this indicator doubled compared to 2010. Particularly, the development of these cultivated areas in the Sheki-Zagatala and Lankaran economic regions should be considered a strategic move. This is because the natural climate conditions in these regions are key factors that create favorable conditions for the more productive cultivation of tea plants.

Table 2. Area of Tea Cultivation by All Farm Categories, ha

| Economic Regions | Newly Planted Orchards Throughout the Year | Plantings, Hectares | | Harvest, tons | | Yield, quintals per hectare |
		Total	In the age of bearing fruit	Total	Age at which the plants start bearing fruit	
Total for the Republic	**15,0**	**996,2**	**696,3**	**1177,7**	**1177,7**	**16,9**
Lankaran-Astara Economic Region	**15,0**	**936,2**	**636,3**	**1121,2**	**1121,2**	**17,6**
Astara District	-	231,5	231,5	788,5	788,5	34,1
Lerik District	-	-	-	-	-	-
Lankaran City	12,5	571,8	355,8	317,2	317,2	8,9
Masalli District	2,5	132,9	49,0	15,5	15,5	3,2
Sheki-Zagatala Economic Region	**-**	**60,0**	**60,0**	**56,5**	**56,5**	**9,4**
Zagatala District	-	60,0	60,0	56,5	56,5	9,4

Source: Prepared based on the data from the State Statistical Committee

Many countries actively use the cluster approach to implement national innovation programs, considering it a measure that includes the results and manifestations of various global economic crises. Today, cluster policy is a key tool for increasing the competitiveness of industries and regions, enhancing their economic development in the medium and long term, and strengthening their innovative potential. At the state level, cluster projects define the significance of cluster initiatives and the necessary set of factors for the effective formation of clusters. The involvement of local and regional authorities, cluster organizations, and various other organizations in such projects can contribute to the formation of a nationwide model or policy that complements regional socioeconomic development measures and strengthens cooperation links between economic entities.

The formation opportunities of a cluster are influenced by the region's

geography, the sectoral advantages of its economy, as well as the beneficiaries of state or regional financial support. These factors interact within an internal cooperation framework in accordance with the triple helix model: the private sector, the education sector, and the public sector (Figure 2).
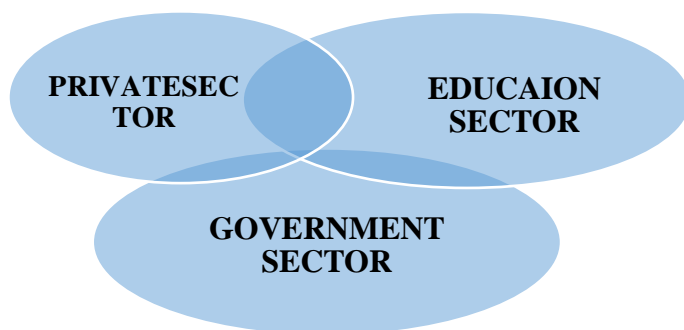

Figure 2. The main principle of cooperation between the public sector, business, and science within a cluster.

It should be noted that a cluster is a set of factors that determine the ability to identify and utilize the profit and innovation opportunities of economic entities in a specific market, as a complex economic system localized in space. This allows us to propose the cluster as an efficient form of spatial organization of the economy.

11. **It is deemed appropriate to determine the directions for improving the mechanism of state stimulation for the cluster-based development of the agricultural sector, particularly tea cultivation.**

In our country, the state's agricultural policy is primarily focused on solving a series of tasks identified in the development sector, including the economic rules and decisions set for the long term, as well as the coordination of these decisions through direct or indirect methods. In certain cases, the state's farsighted and deliberate efforts are directed towards achieving full control over the general state and dynamic growth of crucial economic variables (employment, income, consumption, investment, imports, exports, etc.). Naturally, this policy, first and foremost, affects the overall size and specific directions of state expenditures, as well as a wide range of decisions concerning the

employment, production output, investment, and other aspects of economic entities.

In the context of the formation of state policy in the agricultural sector, particularly in the tea cultivation sector, projections regarding various parameters such as the demand and supply for different products to be produced, the price of raw materials and goods to be consumed, inflation, wages, interest rates, and other similar factors are required. At the same time, the economic policy of the state directly influences changes in these parameters.

The results and recommendations obtained during the research process can be grouped as follows:

1. A retrospective analysis of the main directions of economic thought and a modern view of the stages of development of cluster structures are presented. The identified stages in the formation of cluster theory (Stage I: 18th century - early 19th century - emergence of cluster forms in production organization; Stage II: late 19th century - early 20th century - development of the cluster and the theoretical foundations of cluster formation; Stage III: early 20th century - present day - formation of cluster theory) allow for the most comprehensive tracking of the evolution of economic thought and the sequence of economic development, and the proposed chronological sequence facilitates the generalization of the main ideas and results of scholars' work. The systematization of scientific ideas regarding the formation of clusters in the research has made it possible to determine the place and role of the state's participation in the development of clusters.

2. The criteria for defining clusters are identified based on the emergence, organization, and conditions of the resource space that differentiates the cluster concept from similar structures. For the purposes of this research, the content of the concepts of cluster, cluster core, state regulation of the cluster, and cluster management is clarified, and clusters are identified in the development of interested parties (state, regions, business, and scientific communities). Based on the obtained results, the structure of regional organization for cluster management in Azerbaijan was established.

3. The dissertation examines the main directions of state support for clusters in Azerbaijan against the background of studying international

experience, characterizes the current development of clusters, highlights the problems faced by the state in implementing cluster policy, and proposes solutions based on a comparison of opportunities and needs.

4. The prospects for the implementation of cluster policy in regions are evaluated based on the methodology developed by the author for analyzing and assessing the functioning of clusters in the regional economy. The practical significance of the proposed methodology lies in its consideration of the characteristics of regional development, the processes of forming various clusters, and its integration of quantitative and qualitative assessment methods with the regional economy to obtain a comprehensive description. The methodological studies on the analysis of clusters presented in the work enable the application of these methods for organizing and evaluating clusters in any region of Azerbaijan.

5. The implementation of cluster programs during the formation of clusters may lead to certain risks. The research develops a systematization of risks based on the ranking method of the traffic light matrix: risks related to the development of the region according to cluster policy (macroeconomic level) and risks related to the involvement of organizations in the cluster. The analysis showed that the main risks requiring special attention at the macro level are: negative changes in the exchange rate, exceeding the estimated cost of the project, inflation of costs, as well as risks related to the reduction of prices, the volume of state support for the cluster's development, or its suspension; at the micro level: reduction in income from a 15% decrease in price, delays in the completion of works, etc. To minimize the identified risks, the research presents an analysis of the strengths and weaknesses of internal and external companies, forming a cluster environment that allows for the determination of the general principles for shaping regional and cluster development strategies.

6. The analysis of the results of the development of the country's agriculture, particularly tea cultivation, and the economy of the clusters it consists of, is comprehensively reflected. The analysis is based on the evaluation of the economic activity of the Lankaran-Astara economic region, which participates in six clusters in Azerbaijan, and the identification of general principles and approaches to form regional

development strategies based on them. The results presented in the research are based on a cluster analysis and demonstrate the existence of internal prospects for the development of the region's agricultural and scientific-technical potential based on clusters.

7. The medium-term forecast for the development of clusters concluded that it is necessary to develop clusters in the leading macroregions of Azerbaijan to increase competitiveness and potential. The creation of clusters in lagging macroregions of the country, in terms of the existence of initial conditions and prospects for their development, is deemed appropriate. The research enabled the assessment of promising sectors for the development of clusters: investment in research and development, and agriculture, based on the number of high-productivity jobs.

8. The research presents long-term scenarios for the development of clusters, showing that by 2030, clusters will develop in Azerbaijan according to a conservative scenario. The research introduces a system for synchronizing the updating of cluster development activities aimed at minimizing the mismatch between planned economic indicators and the development programs of clusters in Azerbaijan. The synchronization of the development forecast for the Azerbaijani economy and the long-term scenarios for the development of clusters presented in the research forms a comprehensive platform for developing strategies and forecasts when planning cluster development programs for the medium and long term.

9. The development of clusters is based on modernization processes driven by technology and innovation. Structurally, it encompasses the political, economic, social, and technological spheres of regional development. The author sees the prospects for cluster modernization in the convergence of technology and the formation of "cognitive clusters" during the modernization process of clusters. During the research, an algorithm for improving clusters was developed and substantiated, with state instruments and guidelines for the formation of cognitive clusters in Azerbaijan's regions. As a result of the implementation of the algorithm presented by the author, six cognitive clusters (conscious education, infrastructure, equipment, machines, medicine, biosystems) are formed due to mutually reinforcing activities.

The use of the methodology for analyzing and evaluating the activities of clusters can help address the problem of determining the appropriateness of supporting the development of the economy and clusters by the state, as well as the rational and profitable distribution of tea production across various geographical areas. It can also contribute to solving the tasks of replacing imports, increasing demand for innovations, and stimulating regional development.

The results presented in the dissertation hold practical significance for both the state and clusters, as they address the outcomes of implementing cluster programs, the analysis of risks associated with cluster development, the identification of the potential and prospects of regions in expanding the geographic presence of clusters, and the directions and expected outcomes of medium- and long-term cluster development.

The main content of the dissertation has been reflected in the following published works:

1. Məmmədova P.Q. Azərbaycanda çayçılıq ənənələrinin tarixi və inkişafı // Azərbaycan Dövlət İqtisad Universitetinin Elmi Xəbərləri jurnalı, 2019, №4, s. 192-200.

2. Məmmədova P.Q. Klaster siyasətinin bölgələrin inkişafındakı rolu və əhəmiyyəti // AHİK, AƏSMA, Ulu öndər Heydər Əliyevin anadan olmasının 97-ci ildönümünə həsr olunmuş "Pandemiyanın dünya ölkələrinin sosial-iqtisadi inkişafına təsiri problemləri", Beynəlxalq elmi-praktiki konfransın materialları. Bakı 2020, s. 47-50

3. Məmmədova P.Q. Xarici bazarlarda David çayının dəyər təklifinin formalaşdırılması xüsusiyyətləri // Əmək və sosial münasibətlər elmi-praktik jurnal, 2021, № 1(15), s. 86-92.

4. Məmmədova P.Q. "David`s tea" şirkətinin fəaliyyət aspektləri və dəyər təklifinin formalaşma xüsusiyyətləri // AHİK, AƏSMA, Ulu öndər Heydər Əliyevin anadan olmasının 98-ci ildönümünə həsr olunmuş "Pandemiyanın dünya ölkələrinin sosial-iqtisadi inkişafına təsiri problemləri", Beynəlxalq elmi-praktiki konfransın materialları. Bakı 2021, s. 76-78.

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8. Parvin Mammadova CLASTER STRATEGY FOR REGIONAL DEVELOPMENT: THE NATURE, ADVANTAGES AND EXPERIENCE OF INSTITUTIONAL SUPPORTREGİONAL // INTERNATIONAL TEA CONGRESS "industrial, cultural and economic dimensions" 13-15 May 2022/ Lankaran, Azerbaijan Lenkeran State University. (THE PROCEEDINGS BOOK) All rights of this book belong to IKSAD. Without permission can't be duplicate or copied. Authors are responsible both ethically and juridically IKSAD Publications – 2022 ©/ p 224-233.

9. Məmmədova P.Q. Covid-19 -un azərbaycanda çay plantasiyalarının və çay istehsalının dinamikasına təsirləri // AƏSMA, I Beynəlxalq Sosial Elmlər Konfransı, 28-29 sentyabr 2022-ci il, № 2 (16), Bakı–2021, s. 101-106.

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11. "Enhancing the state's role in cluster-based tea development" // Transforming economics for sustainability mövzusunda Beynəlxalq elmi konfrans. Dunaujvaros Universiteti, Macarıstan, 25-26 mart 2024, s.49-58.

12. "The role of the state in the development of the tea sector in Azerbaijan" // IV Beynəlxalq Boğaziçi Elmi Araşdırmalar Konqresi, Türkiyə, İstanbul. 27-28 aprel 2024, s.442-447.

The defense of the dissertation will be held 30 may 2025 at 16:00 at the meeting of the ED 2.10 Dissertation Council operating under the Azerbaijan State University of Economics.

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It is possible to get acquainted with the dissertation in the library of the Azerbaijan State University of Economics.

The electronic versions of the dissertation abstract are posted on the official website of the Azerbaijan State University of Economics. (http://unec.edu.az/tedgigat/dissertasiva-surasi/).

The abstract was sent to the necessary addresses on 29 April 2025.