THE REPUBLIC OF AZERBAIJAN

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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

THE ESTABLISHMENT OF INDUSTRIAL CLUSTERS AND MODERN DEVELOPMENT TRENDS IN THE REPUBLIC OF AZERBAIJAN

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GENERAL DESCRIPTION OF RESEARCH

Relevance and study level of topic.Clusterization represents a new, more advanced form of economic cooperation aimed at the active economic development of regions and industries, and it is one of the leading and effective directions of the state's internal socio-economic policy in light of modern events in the global economy. The cluster approach has been applied in the formation of industrial policy in countries worldwide since the 1980s and 1990s. Today, it serves not only as a powerful tool for achieving the economic growth objectives of industrial policy, its structural changes, and modernization but also as a means for regional and innovative development, enhancing the competitiveness of enterprises in both domestic and foreign markets. The industrial policy based on the cluster approach is classified as state cluster policy and is effectively implemented by leading countries around the world.

The process of clusterization in the Azerbaijani industry is conditioned by the need to implement sectoral, regional, and national economic and social interests of the country's economic activity subjects, as well as the application of modern European forms of economic interaction and development.

A distinctive feature of the formation of local clusters is their focus on the oil and gas industry complex, light industry, construction, and the agro-industrial complex, while the priority for European countries lies in the development of high-tech innovation clusters in machinery, biopharmacology, electronics, and information technologies. In the current stage of global economic development, clusterization is widely utilized and holds significant importance as a means for the dynamic development of industry through the cooperation, specialization, and concentration of production, activation of innovative activities, the implementation of new technologies, and the enhancement of the competitiveness of local products.

The theory and practice of the cluster approach to industrial development indicate that there are no universal methods for addressing this issue. Therefore, it is a relevant task to develop methodologies and formation methods that consider the characteristics

of sectors and regions, as well as to establish an interdisciplinary economic system based on the cluster approach.

In modern times, there is a great need for a new organizational, legal, and economic environment for the clusterization of industry, which would expedite the market introduction of competitive and high-tech industrial products. Necessary initial foundations for this exist in many regions of our country. Mobilizing and developing the potential of industrial enterprises and research and educational institutions with similar profiles in accordance with the strategic program objectives of the state is a current requirement of our time.

The problem of diversifying and innovating the Azerbaijani economy is directly related to the development and organization of industrial production based on clusterization, including at the regional level. In recent years, serious attention has been paid to researching the problems of clusterization. However, the direction of research in this field mainly reflects conjunctural trends and is more informational in nature. The systematic study of the processes of clusterization in the industrial sphere based on national economic interests highlights the relevance of this dissertation work as a scientific research direction.

The fundamental initial conditions for the formation and development of clusters in various industrial sectors, as well as their organizational, economic, and methodological problems, have been studied in the scientific works of foreign economists such as A.Marshall, M. Porter, Donald A.Hay, Derek J. Morris, S.Rosenfeld, D.Erol, K.Yildirim, D.P.Barsukov, V.S.Kudryashov, M.M.Dvoryashin, M.Ann, M.Trippl, M.Grillitsch, A.Isaksen, T.Sinozic, H.Qian, H.Kostajnica, D.Ionescu, V.L.Abashkin, D.I.Babanski, E.A.Belousova, I.S.Ferova, I.V.Pilipenko, E.Y.Somova, M.Y.Quliyev, V.P.Tretyak, S.V.Artyomov, E.A.Islankina, and others, forming the basis of scientific approaches to cluster activity. The scientific works of the aforementioned theoretical researchers primarily reflect the processes and outcomes of cluster formation in countries with a high level of market economy development.

Individual issues of industrial policy and cluster activity have been explored in the research works of Azerbaijani scholars, including T.

N.Aliyev, T.H.Huseynov, X.M.Huseynova, Q.S.Suleymanov, A.D.Huseynova, U.K.Alekberov, A.A.Quliyev, A.A.Aliyeva, T.M.Aliyeva, S.R.Mammadova, V.M.Azimov, S.C.Jalilova, M.Y.Quliyev, F.X.Kerimli, Z.M.Mursalzade, I.S.Rustamov, L.V.Zeynalli, R.H.Garayev, and others. However, the problem of clusterization in the industry has not been studied as a separate scientific and theoretical research problem. A systematic study of the problems of modern industrial development in this field holds both scientific and practical significance.

The object and subject of the research. The object of the research is the economic clustering processes in the processing industry. The subject of the research is the characteristics of the interactions among the elements that form clusters and cooperation networks in the processing industry, as well as their development trends.

Research goals and objectives. The purpose of the dissertation is to substantiate the theoretical and methodological principles and scientific-practical, systematic approaches to the creation and development of industrial clusters, as well as to identify the directions of development of clustering processes as an organizational-economic form of intersectoral relations.

The stated objectives are specified by the following research tasks:

- To demonstrate the main forms and advantages of clusterization as a form of inter-firm, inter-sectoral, and inter-regional integration in the context of the formation of a post-industrial information economy;
- To determine the role of clusters in ensuring various components of socio-economic security and the sustainable development of national and regional economies;
- To theoretically substantiate effective interaction methods of industrial clusters as a form of intersectoral integration;
- To model the system of regional and inter-regional innovation clusters and identify their development paths as scientific-production complexes;
- To justify the significance of clusters in the socio-economic development of regions through the establishment of centers for

training, retraining, and continuous professional development;
- To study a potential processing industry cluster as a mesoeconomic structure, formulate its development problems for research purposes, and prepare solutions to address these issues;
- To determine the interrelations, commonalities, and characteristics of the development of processing and agro-industrial complexes, as well as their role in ensuring Azerbaijan's economic security.

Research methods. The theoretical basis of the dissertation is formed by the neoclassical school's theoretical approach, theories of economic globalization, particularly the theory of technological differences. The complementarity of these theories enables the substantiation of the clustering potential and directions of the existing industrial model, which is especially important in the context of ensuring the competitive and sustainable development of Azerbaijan's industrial economy.

The main hypothesis of the research is based on the scientifically grounded assumption of the implementation of a new vector of industrial activity in Azerbaijan—clusterization. The central premise here is a process approach that will ensure the mobilization and integration of scientific, technical, and production potential.

During the research, systematic and logical analysis methods, scientific analysis and synthesis methods, comparative analysis methods, and economic-statistical methods were utilized.

The main provisions for the defense:

1. In the context of global challenges, there is a necessity for investigating and systematizing the theoretical and conceptual aspects of the formation of clusters in industry and for justifying the need to utilize conceptual principles for shaping cluster policies in industrial development. This requires a clarification and substantiation of the initial socio-economic conditions.

2. The importance of studying and systematizing international experience in the development of cluster structures in our country and exploring the possibilities of its application in Azerbaijan's industrial regions has emerged.

3. It is necessary to identify and substantiate the priority directions of the state's agile and innovative industrial policy in the context of the formation and organization of regional and inter-sectoral clusters in Azerbaijan.

4. By analyzing and assessing the main indicators of industrial development in Azerbaijan, as well as the status of clustering processes and active industrial clusters, there has arisen a necessity to develop proposals and recommendations for eliminating the negative factors and threats affecting the industrial clustering process.

5. Due to the necessity of ensuring modern sustainable development and addressing global challenges, there is a profound need for a comprehensive study of the directions, mechanisms, and support for realizing the clustering potential of the country's industry, as well as for identifying aspects of the development process of innovative regional clusters in the industrial sector.

6. In terms of applying sustainable development standards to the country's green economy, there is much to gain from developing relevant proposals and recommendations regarding initiatives and measures that the government can implement in the future for forming and executing a green cluster policy.

Scientific novelty of the research.

 The theoretical and conceptual aspects of organizing clusters in the industry have been investigated and systematized, establishing the necessity of enhancing the role of cluster policy in industrial development by identifying the initial economic conditions.

 International experience in the development of cluster structures has been studied, clarifying the possibilities for its application in Azerbaijan's industrial regions.

 The priority directions of the state's industrial policy in the context of the formation and organization of regional and inter-sectoral clusters have been substantiated.

 The status of key indicators of industrial development has been analyzed to assess their impact on the industrial clustering process.

 The current state of the clustering process and active industrial clusters in Azerbaijan has been analyzed and evaluated.

 By examining the directions, mechanisms, and support for realizing the clustering potential of the country's industry, aspects of the development process of innovative regional clusters in the industrial sector have been identified.

 Proposals and recommendations have been developed regarding the directions for the formation and implementation of a green cluster policy by the state.

Theoretical and practical significance of research. The processes of clustering in Azerbaijan's industry reflect a broad range of business interests. Generally, many of the issues explored in this field present novel topics for research. Consequently, business ideas and projects, along with relevant information, are exceptionally diverse and widespread. In this context, the research process utilized not only official statistical databases but also contemporary information sources and websites that reflect new initiatives in industrial collaboration in Azerbaijan. Additionally, references were made to published official data sources from various corporations.

The findings of this dissertation research can be applied in several areas, including the design of small and medium enterprises' participation in industrial clusters in the regions, the utilization of state strategic programs, and the study of methodologies for clustering activities. Furthermore, these results can be incorporated into educational and training processes, enhancing the understanding and practical application of clustering in the industrial sector.

Application and approval of research results. The main findings of the dissertation research were presented at national and international (Russia) scientific conferences. Additionally, 11 scientific articles (totaling 10.5 printed sheets) based on the research materials were published in prestigious international (Russia) scientific journal and in scientific publications recommended by the Higher Attestation Commission.

The name of the institution where the dissertation work was performed. The dissertation was carried out at the Department of "Public Administration and Management" of the Academy of Public Administration under the President of the Republic of Azerbaijan.

The scope and structure of the dissertation work. İn accordance with the objectives and tasks of the research, the dissertation structure consists of an introduction (17,713 characters), three chapters—Chapter I (61,164 characters), Chapter II (86,721 characters), and Chapter III (69,129 characters)—and a conclusion (19,428 characters), along with a list of 128 references and information sources. The dissertation comprises a total of 159 computer-printed pages (254,155 characters) and includes 18 tables, 17 figures, and 1 diagram.

THE MAIN PROVISIONS DEFENDED

In the "Introduction" of the research, the relevance of the topic is substantiated, the degree of problem development is analyzed, and concise information is provided on the research objectives, tasks, methods, main propositions for defense, scientific novelty, theoretical and practical significance.

1. Given the need to investigate and systematize the theoretical-conceptual aspects of cluster formation in the industry in the context of global challenges and justify the necessity of cluster policy in industry development under such conditions, it is essential to clarify and substantiate the initial socio-economic conditions for this purpose.

The expansion of market relations and intensification of exchange has served as a strong impetus for labor division, establishing technological tools as instruments for intensive economic growth. According to A. Marshall, one of the first researchers to adopt an institutional-network approach to studying industry organization and to present it as an institution that ensures organizational profit growth, the market economy can be envisioned as a large organization dominated by coordination mechanisms and decentralized decision-making. In this approach, internal firm relations are an integral part of the broader market economy. Marshall’s ideas on the emergence of clusters have laid the foundation for neoclassical perspectives like spatial economics and new economic geography.

With the adoption of new technologies and production innovations, the industrial network anticipates flexible product lines and mutually beneficial, close collaboration among subcontractor firms. In many dynamically developing countries, active interaction among small, medium, and large enterprises is on the rise. Moreover, a common pattern has been identified, where geographically limited commercial connections successfully develop around large enterprises, with small and medium-sized enterprises clustering around these in various countries based on production-technological and scientific-technical foundations. According to M. Porter's research, competitive companies typically do not expand into different countries by chance; rather, they show a persistent tendency to concentrate in a single country or region within that country. This tendency arises from one or more firms gaining competitive advantage in the global market and then spreading positive effects to the surrounding environment, including suppliers, consumers, and competitors.

For the economy, clusters act as growth points for the domestic market. One of the core tenets of cluster theory is that promising competitive advantages are created not externally but within the domestic markets.

According to neoclassical economic theory, the traditional sectoral approach to studying industry organization essentially reflects the ideas tied to the market-level economy. An alternative approach interprets the sector market to some extent as the outcome of inter-firm interactions. Based on this premise, a necessary research objective is to study the organization level of the interaction between industrial structures and inter-firm cooperation.

The term "cluster" implies that due to their geographic proximity, companies can not only compete with each other but also collaborate to enhance their competitiveness on both regional and national levels, aiming for shared market goals. In Porter's work, the cluster institution is viewed as a new entity that is essential in defining the economic processes for organizing and developing the economy, as well as in establishing state policy to boost the competitive level of the national economy. However, the growing scientific discourse around the

cluster institution and the achievement of results has also led to critical perspectives on the cluster approach. Some researchers argue that the boundaries of a cluster are not precisely defined for determining spatial limits. I. V. Pilipenko distinguishes two different components of a cluster—sectoral and territorial. An industrial cluster is understood as a series of interrelated industries or specialized service sectors within the international division of labor. The term "territorial cluster" refers to firms participating in the cluster that produce identical or complementary products. These firms facilitate information exchange, thereby forming a geographically concentrated group of companies in the same area that support related industries, enhancing competitiveness.

Industrial clusters hold potential opportunities for small innovative firms. Notably, the position of researchers in a number of recent international studies aligns with the idea that clustering is essential for the development of creative companies. In this regard, clustering is viewed as a means of ensuring the survival of small firms in the context of globalization and growing international competition. Additionally, applying the cluster institution could be pivotal for the development of small enterprises in emerging economies.

Although cluster development is better managed by the private sector, governments in countries with a weak private sector can establish supportive cluster structures. These may include infrastructure, logistics, regulatory frameworks, financial resources, capacity-building programs, and joint programs for technology development and innovation.

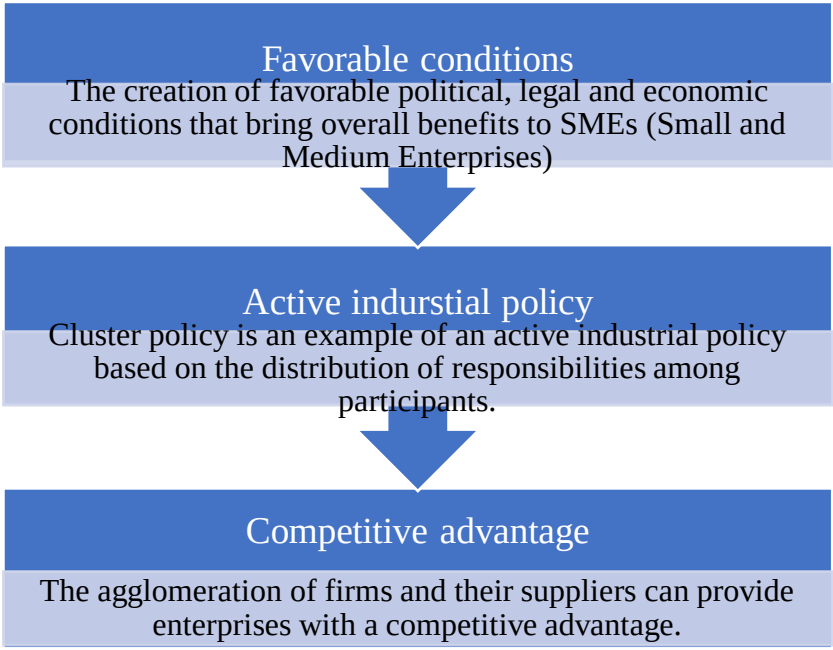

Figure 1. Advantages Derived from Clusters (Author's Own)

The economic driving factors for the formation of clusters in various industrial sectors may include the following:

- Proximity to Markets: Despite favorable levels of international transport costs, being close to markets can be crucial for the development of a cluster, particularly in the production of goods that require ongoing interaction with customers and are not easily transportable.
- Supply of Specialized Labor: The availability of specialized workforce resources, often found in many universities.
- Presence of Equipment Suppliers: High exchanges between capital-intensive product manufacturers and users located in the same area.
- Availability of Specific Natural Resources: The presence of particular natural resources that can support the industry.
- Economies of Scale in Production: Such economies of scale may allow only a limited number of factories to operate in a specific market.

● Existence of Infrastructure: Certain types of infrastructure, including specific transport or service facilities, can significantly enhance agglomeration.

● Lower Operational Costs: When firms and their suppliers operate in close proximity and have frequent interactions, negotiation and contract execution costs can be reduced.

● Information Acquisition Advantages: The ability to access relevant information more easily due to geographic proximity.

A cluster implies that companies, due to their geographic proximity, can not only compete with each other but also collaborate to enhance their competitiveness at both regional and national levels in order to achieve their market objectives.

2. The importance of studying and systematizing international experiences in the development of cluster structures in our country has emerged, along with the exploration of the possibilities for their application in Azerbaijan's industrial regions..

In the modern era, the functioning and fundamental development of production networks in many regions of the world hold significant importance. Notably, the European Union, the United States, China, and numerous developed countries, as well as leading manufacturing companies, have expanded the forms of existing cluster cooperation.

Thanks to clusters, many regions in Europe have been able to develop competitive advantages in various fields. Examples include the financial center in London, the petrochemical cluster in Antwerp, the flower-growing cluster in the Netherlands, and the pharmaceutical cluster on the Denmark-Sweden border.

The experience of forming industrial cluster groups in many countries exhibits markedly different characteristics in terms of development. It is beneficial to consider six main models for the formation of industrial groups, each with its specific development traditions:

Italian Model: This model is based on the activities of numerous small firms that cluster together to enhance their competitiveness. It is

primarily applied to low-tech products that differ significantly and are subject to demand fluctuations.

Japanese Model: This model centers around a leading company that integrates most suppliers at various stages of the supply chain, focusing on large-scale production of technologically diverse products.

Finnish Model: Characterized by a robust research and development sector supported by an advanced education system, this model emphasizes high-level innovation. It incorporates the process of internationalization for businesses and is suitable for relatively small, resource-scarce, export-oriented countries.

North American Model: This model strengthens competition among enterprises, applying when the production process does not necessitate close relationships. Through competition among suppliers and mass production, the leading company achieves lower price levels for its final products.

Indo-Chinese Model: In this model, the state plays a crucial role. The primary focus is on attracting foreign investments that bring modern technologies and facilitate access to global markets.

Turkish Model: The activity of clustering in Turkey initially appeared in the Ninth Five-Year Development Plan, emphasizing joint research, enhancing enterprises' activities in similar supply and marketing areas, and addressing the needs of physical infrastructures while establishing networks and supporting clustering initiatives. The transfer of existing enterprises to designated industrial regions has also been encouraged, contributing to the development of clustering across a larger part of the country's territory.

The effective implementation of cluster policy has become a significant agenda in the Russian Federation. Some real cluster initiatives are supported within various government programs. Currently, there is a unified mechanism for organizing and developing clusters at the federal level in the Russian Federation. According to the support program from the Ministry of Industry and Trade of the Russian Federation, many supported industrial groups are interregional, facilitating the creation and expansion of new cooperation networks with the inevitable participation of industrial

enterprises from various regions, broadening the sales scale of produced goods, and taking into account existing interregional cooperation ties.

The European Cluster Observatory has identified ten key developed industrial sectors formed through the integration of traditional industries. The activities of these sectors are characterized by modern trends and scientific-technical connections. In Europe, the significant spheres of activity of developed industrial sectors are primarily divided into three categories:

- A traditional economic center located in a narrow band stretching from southern Germany through Benelux to the southern border of England.
- Innovation leaders in Europe, from Denmark to the west of Sweden and along a line from Stockholm to southern Finland, extending to Helsinki.
- Centers in other European cities where the benefits of high population density are maximized.

In examining changes in cluster activities across Europe over the past decade, it is evident that the desire for cluster programs has driven the development of highly specialized sectoral cluster programs in various regions. The best regional cluster groups in Europe include those in creative industries, digital industries, and ecological technology sectors.

Table 1.

Avropada kreativ sənayenin ən yaxşı regional klaster qrupları

Country	Region (NUTS II)	Assigned star rating
Norway	Oslo and Akershus	4
France	Paris region	3
United Kingdom	Inner London	3
Germany	Upper Bavaria	3
United Kingdom	Berkshire, Buckinghamshire, and Oxfordshire	3

Source: European Cluster Panorama (2014) European Cluster Observatory report, October, p. 40.

The responses obtained from the research survey conducted in the European space directly highlight the strategic priorities outlined below for addressing the identified problems.

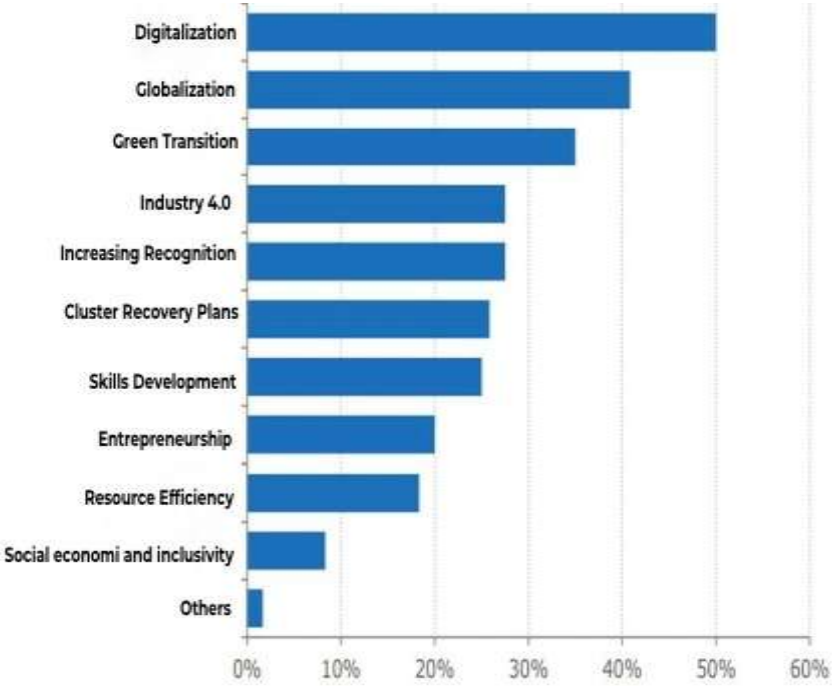

Figure 1. Key Strategic Priorities of Cluster Groups in the European Union in 2022

The reviewed experiences confirm that modern high-tech manufacturing can only be based on horizontal, regional, and vertical integration processes. These processes are recognized as an objective necessity for the development of technological platforms, particularly relevant for the advancement of the industrial sector in Azerbaijan.

3. It is essential to identify and substantiate the priority directions of the state's flexible and innovative industrial policy in the context of the formation and organization of regional and inter-sectoral clusters in Azerbaijan.

The strategy for diversifying the economy of Azerbaijan has transformed industrial development into a priority direction of economic policy. Economic resources indicate the multifaceted development of the processing industry in relation to the establishment of industrial development in Azerbaijan. The country's natural conditions have facilitated the creation of various sectors of industrial production. In turn, rich natural resources, modern energy and transportation infrastructure, and a highly qualified workforce are considered essential prerequisites for new industrial projects.

Currently, out of 264 enterprises operating in the light industry sector of our country, particularly in textiles and garment production, 66.7% are micro enterprises and 17% are small enterprises. Each of these enterprises employs up to 10 workers and 11-50 workers, respectively. According to statistical data from 2023, the number of medium and large enterprises is 43. It is possible to establish textile clusters based on enterprises that have technological connections with these large enterprises while maintaining their independence.

The main idea behind the formation of industrial clusters is to create scientifically grounded and technologically feasible comprehensive solutions, as well as commercial mechanisms, to establish conditions for the implementation of an innovative strategy for industrial development, thereby enhancing its competitiveness.

As part of the state support for the development of cotton cultivation in Azerbaijan, subsidies were allocated to cotton producers for each kilogram of raw cotton sold to processing enterprises. As a result of these measures, the revival of cotton cultivation in Azerbaijan is being achieved through the expansion of cultivated areas and the increase of cotton productivity per hectare. In the cotton sector, Azerbaijan collaborates with countries such as Turkey, Greece, China, and Australia, which opens up significant opportunities for the production and export of textile products. The industrial experience and technological advantages of these countries are among the key factors that can contribute to the establishment of a cluster network for cotton production in Azerbaijan.

The current trends in the operations of processing industry enterprises and the main indicators of textile industry enterprises can be reviewed based on the following tables.

Table 2.

Key Indicators of the Processing Industry in Azerbaijan from 2010 to 2023

Indicators	**2010**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Number of Active Enterprises	1909	2034	2330	2515	2777	3130	4691
Volume of Industrial Output (Work, Services), billion manats	28,0	47,7	47,0	37,3	55,2	86,4	67,3
Share of the Sector in the Total Volume of Industrial Output Produced in the Country, %	15,9	21,9	25,1	31,8	28,8	21,0	27,3
Investments in Fixed Capital, million manats	510,2	756,8	2466,4	2610,5	2018,0	1202,2	916,8
Share of Investments in the Sector in the Total Volume of Investments Directed to the Industrial Sector, %	11,9	8,9	26,7	28,8	26,9	16,8	10,9

Source: Compiled by the author based on data from the State Statistical Committee of the Republic of Azerbaijan.

Here's the translation into academic English:

According to statistical data, the share of the processing industry in the total volume of industrial products produced in the country has

increased from 15.9% to 27.3% over the last 13 years. During this period, the share of the textile industry has only risen from 0.1% to a mere 0.6%. Improving the situation in this sector requires the development of forms of industrial cooperation in the textile industry. At the same time, we believe that existing problems can partially be addressed through the development of regional inter-sectoral clusters by the state and local authorities, which can be based on the following:

a) Assisting in the institutional development of regional inter-sectoral clusters;

b) Establishing mutually beneficial information connections among the participants of the textile cluster;

c) Implementing measures to stimulate cooperation among the participants of the textile cluster;

d) Supporting the implementation of projects aimed at enhancing competitiveness and improving the efficiency of interactions among enterprises and organizations in the light industry.

One of the strategic issues that constitutes the importance of the country's industrial policy is the development of regions and remote areas and the efficient use of industrial potential. Ensuring access to and expansion of the activities of industrial enterprises in remote regions through clusters and industrial parks primarily requires addressing a number of specific regional issues within industrial policy. It is worth noting that the establishment of industrial parks and clusters is not planned in the country's remote geographical areas. Theoretically, clustering in the agrarian industry can be more easily adapted to rural areas; however, it is necessary to further examine the context of specific specialization and potential partner organizations.

4. By analyzing and evaluating the key indicators of industrial development in Azerbaijan, as well as the state of the clustering process and active industrial clusters, there arises a necessity to develop proposals and recommendations for the elimination of negative factors and threats affecting the industrial clustering process

At the modern stage, the high-level organization of the technological base of priority sectors in industry and the development of management constitute the strategic objectives of industrial policy.

The financing and support of high value-added industrial projects implemented in Azerbaijan are defined by new tasks. In this regard, the following tasks are becoming relevant in industrial production:

- Attracting direct investments and technologies from large industrial firms to Azerbaijan, thereby creating new opportunities in the non-oil sector;
- Stimulating research projects that can contribute to the development of clustering in the non-oil sector of the economy;
- Supporting economic development, as well as economic diversification and import substitution processes, alongside the creation of clustering opportunities.

Industrial production is characterized by various sectoral products. In 2023, industrial output consisted of 67% from the mining sector, 27.4% from the processing sector, 4.7% from the production, distribution, and supply of electricity, gas, heat, and steam, and 0.9% from the water supply, waste transportation, treatment, and disposal sector. It is our opinion that not all sectors of industrial production carry the significance of clustering; however, the development of industrial sectors indicates a necessary infrastructure and service potential for the organization of clusters.

The implementation of clustering initiatives in the industry primarily depends on the application of investment resources and technological design, the confidence of investors, and the leading policies of the state. The key aspects of the business environment in Azerbaijan can be summarized as follows.

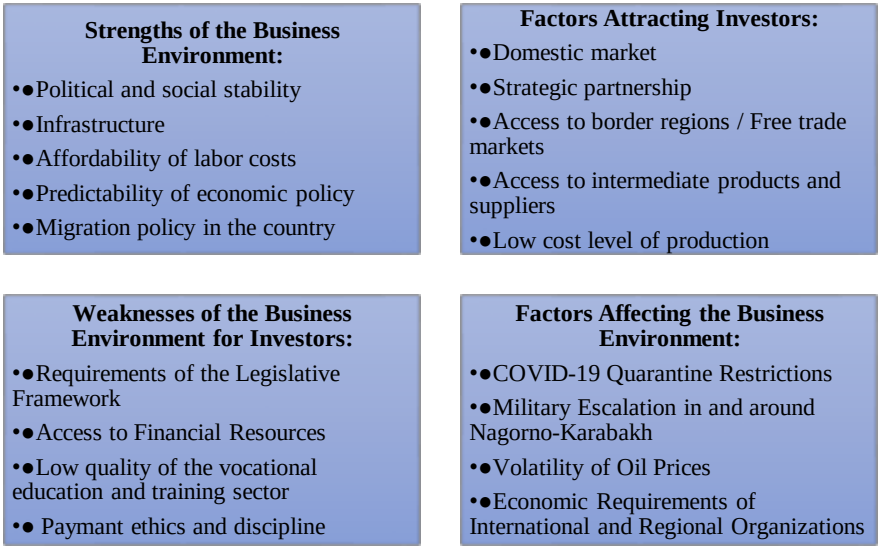

Figure 2. Key Aspects and Factors of the Business Environment in Azerbaijan (Compiled by the Author)

As shown in the figure, one of the weaknesses of the business environment for investors is the lagging quality of the vocational education and training sector behind modern requirements. One of the key issues for the successful resolution of clustering in the industry is achieving a high level of vocational training and modern skill sets. It should be noted that equipping workers with modern qualifications, vocational skills, and competencies constitutes the primary training issues.

As a significant mechanism for investment solutions created by the state, it is advisable to realize potential directions in the non-oil industry, considering the capabilities of the CIS in the clustering of industrial production and partnership practices. In particular, the importance of the following factors can be emphasized:

- Establishing effective coordination between state enterprises and the CIS;
- Access to international capital markets;

- The ability to present projects to international investors and support the establishment of international business connections;
- Implementation of corporate governance practices in portfolio companies and extensive experience in market research, financial modeling, and taxation.

Industrial diversification requires the creation of modern production capacities alongside traditional industrial sectors. In this regard, the construction of new high-tech facilities is an essential direction for industrialization. It is noteworthy that new opportunities are currently being considered for expanding the production of electronic equipment and pharmaceutical products.

5. Given the necessity of ensuring sustainable development and addressing global challenges, there has arisen a deep need for comprehensive research into the directions, mechanisms, and support for realizing the clustering potential of the country's industry, as well as identifying aspects of the development process of innovative regional clusters in the industrial sector.

It is particularly important to consider ways to unite the main actors involved in the innovation system within industrial cluster policy, namely the industry, state institutions, and scientific organizations. In today's context, maintaining strong interconnections among the relevant actors is crucial not only for the application of new technologies but also for fostering innovations. There is no single organizational plan or model for a successful cluster or technopark. Experience shows that policymakers should focus on a country's comparative advantages. In economies dominated by natural resources, entrepreneurial culture may be weak, necessitating the creation of opportunities and models for young and talented individuals. Technological park incubator models are a good approach.

In general, it is advisable to incorporate the issue of clusters and technoparks into a comprehensive state policy and strategy. One of the main differences between Azerbaijan and other developing countries

rich in natural resources is the importance of state strategy, programs, and support.

The experienced company Marketing Consulting GmbH recommends that governments pay attention to ten guiding principles to ensure social, economic, and environmental sustainability. Many of these can be considered in the implementation of Azerbaijan's industrial clustering potential.

First, it is necessary to ensure that partners' commitment to the government is addressed in the approach to long-term activities. For instance, existing experiences show that economic zones and clusters can achieve success within 5-10 years. The Tax Code of the Republic of Azerbaijan and the Law on Customs Tariffs establish favorable conditions for the participants of industrial parks.

Second, specific goals are defined in each government strategy. In this process, countries should be based on an assessment of their economic potential, investment potential, and target groups.

Third, it is required to review the synergy and connections among clusters, industrial zones, and parks. Each has a distinct orientation, and planners should carefully consider issues that best reflect the national or regional context and the government’s goals and priorities.

Fourth, economic, ecological, and social sustainability must be considered from the outset.

Fifth, maximum utilization of existing resources and capabilities is essential. Many of the previously existing forms of industrial complexes in non-oil sectors, such as machine engineering, cotton production, and others, have emerged over time. However, this has now become a new issue.

Sixth, there is a need for the development of a strategy, promotion, and regulatory framework. For example, incentives aligned with a cluster approach should be offered.

Seventh, investment in specific facilities or services and specialized skills is essential. This requires exploring various ways to attract investment and innovation.

Eighth, the organization of zones and groups cannot replace comprehensive economic reform. However, zones provide an ideal opportunity for testing reforms, policies, and environmental standards.

Ninth, it is necessary to encourage parks and zones to cooperate and learn from one another.

Finally, zones and parks should be integrated into the broader economy and utilized to promote regional integration.

In the process of realizing the clustering potential of the industry in Azerbaijan, the state support system and stimulation mechanisms play a particularly decisive role at this stage. Currently, one of the critical issues relates to new opportunities.

A significant driving force behind the clustering potential of the industry in Azerbaijan is the enhancement of business opportunities and competencies of small and medium-sized enterprises (SMEs). The development of SMEs is considered one of the key factors for enhancing the competitiveness of the country's economy.

To expand the participation of the private sector in the national economy and ensure sustainable economic development, establishing organizations that support the role of small and medium-sized businesses in economic development is one of the current tasks of the modern era. Increasing the share of SMEs in employment and strengthening competitiveness are important issues in contemporary economic policy. Ensuring cost-effective and efficient access to financing resources for SMEs, primarily through SMEs to meet the demand for essential consumer goods, and expanding the opportunities for SMEs to enter foreign markets are identified as strategic goals.

Figure 3. The role of small and medium enterprises in the clustering of industrial production: issues of enhancing competitiveness and implementing effective coordination (author's approach).

The main tasks set in industrial production are determined by state support. However, in terms of directions of activity and outcomes, the initial decisive focus will be on the motivation measures for small and medium enterprises. In terms of developing linkages with industrial groups, it is advisable to implement these measures through mechanisms and tools that stimulate the activities of small and medium-sized business entities.

The results of the analysis indicate that the effective involvement and participation of business and entrepreneurial organizations of

various profiles is determined by the efficiency of state support mechanisms. However, this is also conditioned by the proper organization of the activities of entrepreneurial enterprises within the established business environment and the enhancement of their competitiveness. From this perspective, the necessity of implementing a series of supportive measures aimed at developing the knowledge and skills of entrepreneurs becomes relevant.

6. With regard to the application of sustainable development standards for the country's green economy, greater benefit can be derived from the development of relevant proposals and recommendations concerning the initiatives and measures that the government can implement in the future for the formation and implementation of its green cluster policy.

Considering the emphasis on the implementation of Industry 4.0 strategies as a significant objective in the country's industrial policy, the development of green production as an essential innovation component within Azerbaijan becomes increasingly relevant. This trend holds substantial potential for the innovative development of the national economy. Currently, Azerbaijan is pursuing a successful policy aimed at establishing a green economy as a key component of sustainable development. In the context of global climate change, serious scientific research is being conducted in developing countries to ensure the provision of various food products that will meet the current and future needs of the increasing population through the application of genomic technologies and digital solutions. The era of the green revolution is primarily viewed as an extraordinary phase in the sustainable increase of global food security. This phase is characterized by the intensification of agricultural sectors, leading to an increase in the production of all food products worldwide, particularly cereal crops such as wheat, corn, and rice.

According to World Bank data, humanity produces over 2 billion tons of solid waste annually, with a potential risk of this figure growing to 3.4 billion tons by 2050. If we also include the untreated waste from industrial and agricultural enterprises, these figures will significantly increase. Additionally, forecasts by McKinsey Consulting suggest that the application of zero-waste production and

the establishment of new enterprises focused on the utilization of recyclable materials could yield an additional $4.5 trillion for the global economy by 2030. Today, the most active "green" production and recycling are developing in Scandinavian countries, the USA, Canada, as well as in Japan, China, and South Korea.

The primary objective of Azerbaijan's transition policy to a green economy is to facilitate the formation of economically sustainable growth based on ecological principles, including the economically efficient use of natural resources, the promotion of environmentally sustainable production and consumption, and the creation of new (green) jobs. In this context, one of the significant outcomes of the expansion of industrial production in Azerbaijan is the increase and reuse of production and household waste. Considering Azerbaijan's dependence on hydrocarbon production, the government must find new pathways for the transition to a green economy, with an increasing role for ecological education being an integral part of this overall policy.

The innovative projects being implemented serve as a contemporary example of how a significant industrial cluster is being formed in Azerbaijan within the framework of the green economy strategy. Cluster development stimulates the resolution of ecological problems and the efficient advancement of industrial production, taking into account market factors, by involving local and foreign commercial structures and scientific organizations.

The transformation of technoparks into a core element of the innovation system in Azerbaijan not only accelerates the organization of production processes but also creates prospects for reducing the national economy's dependence on oil factors and applying modern methods to enhance the competitiveness of the industry.

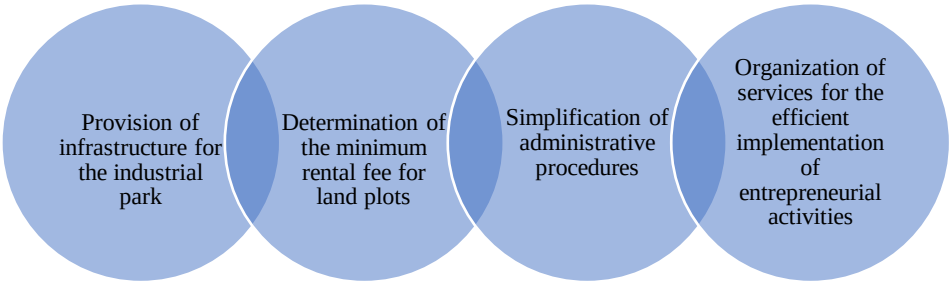

Figure 4. Organizational measures to support the development of business activities in industrial parks in Azerbaijan

***Source**: Based on information from the Ministry of Economy of the Republic of Azerbaijan (compiled by the author).*

As can be seen, residents operating in the Technology Park areas are granted corresponding privileges. These privileges create a stimulating environment for private companies and reduce their production costs. Firstly, by attracting to the Technology Parks, residents are exempt from property, land, and income taxes for a period of 10 years after registration. This can be considered a significant duration for business activities. Secondly, imported foreign machinery and technological equipment, as well as mechanisms, are exempt from import customs duties, including value-added taxes (VAT), for a period of 7 years. The implementation of such concessions enhances the international operation and attractiveness of Industrial Parks.

Another important aspect of clustering in industrial parks is the emphasis on local as well as international collaboration in production processes. The Technology Park should not only engage existing companies in the country but also expand cooperation with firms and research institutions that operate with high competitiveness in regional and international production processes. It is crucial to establish close ties and reciprocal visits with technoparks in different countries to become well-acquainted with innovations emerging in modern international practices and the field of innovation.

The main content of the dissertation work is reflected in the following scientific works:

1. S.R.Rəhimli. Azərbaycanda sənaye klasterlərinin ölkənin sənaye siyasətində rolu. "Azərbaycan Respublikasının sosial-iqtisadi inkişaf perspektivləri: Məqsədlər, Vasitələr və İqtisadi İnkişafın İnklüzivliyi" mövzusunda respublika elmi konfransının materialları. Bakı, Azərbaycan Respublikasının Prezidenti yanında Dövlət İdarəçilik Akademiyası 2020 s.13-19
2. S.R.Rəhimli. Klasterləşmənin sənayedə rolu."Dövlət İdarəçiliyində islahatların yeni mərhələsi" mövzusunda respublika elmi konfransının materialları. Bakı,Azərbaycan Respublikasının Prezidenti yanında Dövlət İdarəçilik Akademiyası, 2020 s.163-169
3. S.R.Rəhimli. Dördüncü sənaye inqilabının mümkün nəticələri aspektində şirkətlərin yeni təşkilati konsepsiyalarının əsas prinsipləri. AMEA İqtisadiyyat institutu. AMEA-nın Xəbərləri. İqtisadiyyat seriyası № 5 2021.s.23-29
4. S.R.Rəhimli. Sənaye klasterlərinin yaradılmasında əsas xüsusiyyətlər. Ümumilli lider Heydər Əliyevin anadan olmasının 98 illiyinə həsr olunmuş "Universitet reytinqi məsələlərinin əsas problemləri" mövzusunda beynəlxalq elmi-praktik konfransın materialları. Gəncə, Azərbaycan Texnologıya Universiteti 2021 № 2 s.291-294
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6. С.Р.Рагимли. Перспективы кластеризации промышленности Азербайджана в контексте «Зелёной» экономики Материалы международной научно-практической конференции по теме «Механизм реализации стратегии социально-экономического развития государства». Дагестанский Государственный Технический Университет. 2021 с.120-123
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10. С.Р.Рагимли. Некоторые подходы к инновационному развитию и кластеризации в промышленности Азербайджана. Проблемы современной экономики «Евразийский международный научно-аналитический журнал» №1(81) 2022. с.174-177
11. S.R.Rəhimli. Sənayenin klasterləşməsinə dünya alimlərinin və ölkələrinin yanaşmaları. Azərbaycan Texnologiya Universiteti. “İnnovasiyalı iqtisadiyyat və menecment”jurnalı, №1 2022, s.125-133

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