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### **CONCEPTUAL FOUNDATIONS OF THE REGIONAL INDUSTRIAL CLUSTER FORMATION BASED ONEUROPEAN EXPERIENCE AND LEADING WORLD TENDENCIES**

**Abstract.** The article conducted a thorough analysis of contemporary works of scientists dedicated to the research of regional economic development through the functioning of the clusters. The presence of a large number of scientific achievements in the world and in Ukraine on these issues is revealed, which testifies to the complexity and multidimensionality of the studied clustering process and the relevance of its further research. Further study of European experience in the sphere of clustering in this article has revealed more than fifty-year interest and intensification of practical actions in the formation cluster principle of developing European economies.

For a more thorough understanding of the mechanism of introduction and development of the cluster principle of different European countries, the article analyzed cluster experience in such ones as Italy, Austria, Denmark, Finland, France and their peculiarities. In particular, the driving factors and prerequisites of clustering are clarified; Measures, which contributed to the development of clusters, the concepts of clusters, features of the implementation and development of the cluster model, as well as the effects and results of clustering.

In the paper separately the analysis of the industry trend of the clustering industry of Western European countries was carried out, on the basis of which conclusions are made that the cluster policy should be conducted in the spheres of activity that define the perspective The region's economic specialization and has a high potential for growth and competitiveness.

Based on the European experience of the formation and development of cluster structures and peculiarities of the implementation of clustering processes and the state of functioning of industry in modern conditions in Ukraine in the article proposed conceptual scheme of construction Clustering of industry in the region, which consists in sequential implementation of such stages as conducting directly clustering taking into account the existing potential of the region, its innovation, investment and other resources; Development of strategy for the implementation of cluster initiatives; Monitoring, regulation and control over the cluster activities. At the same time, positive changes in the industry of the region, in our opinion, will positively influence the intensification of innovation and investment development, inter-regional ties, promising areas of activity, improving the level of competitiveness of products and services.

**Keywords:** region, cluster, industry.

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## **КОНЦЕПТУАЛЬНІ ЗАСАДИ ФОРМУВАННЯ ПРОМИСЛОВОГО КЛАСТЕРУ РЕГІОНУ НА ОСНОВІ ЄВРОПЕЙСЬКОГО ДОСВІДУ ТА ПРОВІДНИХ СВІТОВИХ ТЕНДЕНЦІЙ**

**Анотація.** Проведено ґрунтовний аналіз сучасних праць вчених, які присвячені дослідженню регіонального економічного розвитку через функціонування кластерів. З'ясовано наявність великої кількості наукових доробок в світі та в Україні з цієї проблематики, що свідчить про складність та багатоаспектність досліджуваного процесу кластеризації та актуальність його подальшого дослідження. Подальше вивчення Європейського досвіду в сфері кластеризації в даній статті виявило понад п'ятдесятирічний інтерес та активізацію практичних дій у становленні кластерного принципу розвитку економіки європейських країн.

Для більш ґрунтовного розуміння механізму запровадження та розвитку кластерного принципу різних країн Європи було проведено аналіз кластерного досвіду в таких, як Італія, Австрія, Данія, Фінляндія, Франція та виявлено їх особливості. Зокрема, з'ясовано рушійні фактори та передумови кластеризації; заходи, які сприяли становленню та розвитку кластерів, прийняті концепції кластерів, особливості впровадження та розвитку кластерної моделі, а також наслідки та результати кластеризації.

Проведено аналіз галузевого спрямування кластеризації промисловості західноєвропейських країн, на основі якого зроблено висновки про те, що кластерна політика повинна проводитися в сферах діяльності, що визначають перспективну спеціалізацію економіки регіону і мають високий потенціал зростання і конкурентоспроможності.

На основі Європейського досвіду щодо формування та розвитку кластерних структур та особливостей впровадження процесів кластеризації та стану функціонування промисловості в сучасних умовах в Україні запропоновано концептуальну схему побудови кластеризації промисловості регіону, яка полягає в послідовному виконанні таких етапів як проведення безпосередньо кластеризації з врахуванням наявного потенціалу регіону, його інноваційних, інвестиційних та інших ресурсів; розробка стратегії з реалізації кластерних ініціатив; моніторинг, регулювання та контроль за діяльністю кластера. При цьому позитивні зрушення в промисловості регіону, на нашу думку, позитивно вплинуть на активізацію інноваційно-інвестиційного розвитку, міжрегіональних зв'язків, перспективних напрямів діяльності, підвищення рівня конкурентоспроможності продукції і послуг.

**Ключові слова:** регіон, кластер, промисловість.

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## КОНЦЕПТУАЛЬНЫЕ ОСНОВЫ ФОРМИРОВАНИЯ ПРОМЫШЛЕННЫХ КЛАСТЕРОВ РЕГИОНА НА ОСНОВЕ ЕВРОПЕЙСКОГО ОПЫТА И ВЕДУЩИХ МИРОВЫХ ТЕНДЕНЦИЙ

**Аннотация.** Исследованы основные процессы, сопровождающие функционирование кластерных структур в современных условиях, осуществлен анализ ведущих мировых тенденций и Европейского опыта применения кластерного подхода, на основе которого предложены пути активизации процессов формирования кластеров в регионах Украины. Разработана концептуальная схема создания промышленного кластера региона.

**Ключевые слова:** регион, кластер, промышленность.

Формул: 0; рис.: 1; табл.: 2; библи.: 19.

**Introduction.** Nowadays when the situation in the world market is unstable, the risks and difficulties in foreign economic relations and foreign investments attraction increase every day, each state tries to determine the most effective strategy for its economic development. The level of successful implementation of the social and economic development strategy of each country is evaluated both inside the country and abroad.

The formation of a new, effective structure of the regional economy, in our opinion, should be done through the creation of territorial-industrial associations or clusters, which studies attracted much attention in the world recently. Scientists researches dedicated to the investigation of regional economic development through the functioning of clusters testifies that the development of theoretical and methodological provisions of this model implementation still has a large field for research.

**Analysis of Publications and the Research Purpose.** There are several scientists who are investigating the industrial clusters, among them are M. Porter [11], J. Lan [6], W. Chengjun [6] and Z. Wei [6], Q. Liu [13], J. Wan [13], K. Zhou [13], H. Cheng [4], M.-S. Niu [4], K.-H. Niu [4], S. Hartono [16], A. Sobari [16], C. Sylvie and A. I Henrick [1], T. Sonobe [15], O. Keijiro [15], Hashino T. [3], Otsuka K. [3], V. E. Hoffman [5], G. S. Lopes [5], J. J. Medeiros [5].

Jiang Lan, Wang Chengjun and Zhang Wei consider that continuous industrial development will inevitably form an agglomeration effect after reaching a certain level. When the industrial agglomeration effect appears, the growth of the industry will be stimulated, and it would cause further optimization and upgrading, thereby attracting the relevant industry chain to achieve the scale and efficiency, and finally, the phenomenon of industrial clusters will be achieved. The advantages of industrial clusters relative to industrial competition lie in the benefits of industrial economies in clusters, and their good influence on the economic development of clusters and surrounding areas. Therefore, all countries in the world are very concerned about the development and research of industrial clusters [6].

Qiang Liu, Jiafu Wan, Keliang Zhou researched, that such modern technology and business demands as information sharing, design, outsourcing manufacture, orders collaborating, etc., among enterprises and factories in the industrial cluster area, ask for public technology supports and services. Recently, Cloud Manufacturing Service System (CMSS) is a novelty way to provide open and generalized manufacturing services. In order to fulfill the real-time designing and manufacturing information exchange among the collaborative partners in an industrial cluster area, we designed an industrial-cluster-oriented CMSS and provide services for these small and medium manufacturing enterprises by means of the mobile cloud system and relative technologies [13].

The primary purpose of the study conducted by scientists Hilary Cheng, Ming-Shan Niu, Kuei-Hsien Niu (from Taiwan and USA) is to examine the relationships among an enterprise industrial cluster involvement, organizational learning and its ability to successfully adapt to the external environment. The study finds that being positioned in an industrial cluster enhances an enterprise education and further leads to the desired adaptive outcomes. The significant contribution of this study is an initial attempt to provide a comprehensive approach to analyzing an enterprise industrial cluster involvement. Further, the study attempts to empirically examine learning and cluster involvement in relation to organizational adaptation [4].

During the research of Sri Hartono, A. Sobari the main factors in the formation of clusters cooperation are the maturity cycle and degree pattern of bilateral, multilateral and vertical. Characteristics of clusters that meet those criteria are expected to influence the formation of more complex clusters that can be morphed into the form of an agglomeration with its system of the integrated industry supply chain from downstream to upstream. For competitiveness increase, clusters are realized in high-level competition and need to be mature in cooperation between members using the pattern of bilateral and multilateral cooperation. They should rely more on vertical cooperation; the use of horizontal cooperation only would be ineffective in this case. Research proves that the cluster developed into an agglomeration is characterized by more healthy competition and collaboration between entrepreneurs. However, the results of the study show that the cluster benefits were supported by the activity of the business doers to encourage the dynamics inside the cluster. Yet, considering the important role of clusters in improving the performance, the existence of the cluster can be seen not only from the purely economic point of view [16].

Chetty Sylvie and Agndal Henrick revealed that the industrial cluster had been used by small and medium enterprises (SMEs) to expand their international markets, develop innovative products and marketing strategies, as well as to identify business opportunities. This industrial area enables SMEs to benefit from economies of scale. Policy makers have recognized the importance of SME leaders in acting as a catalyst to initiate the development of industrial clusters. Corporates that are in the industry cluster can make efforts to increase cooperation and establish networking together to foster healthy competition. The balance between cooperation and competition becomes an essential aspect of an industrial cluster [1].

The book of Sonobe T., Keijiro O. analyzes the dynamic process of industrial development involving imitation and innovation. The authors pay particular attention to the significance of industrial clusters consisting of a large number of small and medium-sized enterprises within a specific location. While the phenomenon of clustering of industries itself is a matter of interest (i.e., «why do industries tend to agglomerate?»), most of the economics studies do not examine deeply such important issues as: «what is going on in industrial clusters?», «how do industrial clusters are beneficial to the economic development?» and «what should we do about industrial clusters?» This study makes a substantial contribution to fulfill such a gap with rigorous empirical analyses based on the rich data obtained from extensive field research in Japan, Taiwan, and China [15].

The study of T. Hashino, K. Otsuka attempts to examine the relevance of the Sonobe-Otsuka model, which is designed to explain the long-term process of cluster-based development in developing countries on the example of silk-weaving clusters development in prewar Japan. They discovered critical influences of trade associations and local governments in internalizing the agglomeration economies in the development of the silk-weaving industry in Japan. They argue that further efforts are needed to be made for exploring the importance of trade associations and local governments in the development of industrial clusters in developing countries [3].

The work of V. E. Hoffman, G. S.C. Lopes, J. J. Medeiros shows how knowledge is shared among small businesses operating in industrial clusters and how this competitive resource circulates and accesses within the cluster. Interfirm cooperation, industrial support institutions, workforce mobility, and social ties were used to structure the survey instrument as concepts highlighted in the literature as dimensions of the knowledge transfer process [5].

Among Ukrainian developers of the scientific concept of the cluster are S. I. Sokolenko [14], Yu. V. Kindzerskyi [8], I. V. Vyshniakova [18], O. O. Karpenko [7], T. A. Pushkar [12], V. H. Fedorova, O. Ye. Kuzmin [10], I. V. Vyshniakova [18], M. M. Yermoshchenko [19], M. V. Gudz [2] and many others.

In the presence of significant scientific research on this subject, many questions still need a thorough study. In particular, the conceptual approach to the formation and development of regional industrial clusters in Ukraine in the prism of European clustering experience and leading world tendencies.

The article aims to develop conceptual fundamentals of cluster structure building of the region, taking into account the leading world tendencies and European clustering experience.

**Research Findings.** The primary goal of modern industrial policy of countries is the growth of the national economy through increasing the competitiveness and the share of domestic companies in the local and foreign markets and improvement of their efficiency.

The objective conditions of the change in the paradigm of competitiveness management, which consists of the refusal from traditional industrial policy and transition to the new system of production organization using the advantages of specialization and cooperation, are leading characteristics of the world economy such as the processes of globalization and increase in global competition.

In the period of rapid development of technologies, logistics, information systems, the most important factors of achievement and preservation of competitive advantage are not only innovations and studies, but the establishment of networking between enterprises, which provide conditions for the creation of new integrated structures such as clusters. Thus, clusters unite industrial enterprises and related economic stakeholders, which helps to speed up their modernization and competitive product manufacture and increases export. The industry becomes a means of ensuring the employment of population, modernization of technologies and productions. It increases competitiveness and efficiency.

Today cluster principle of industry construction has spread all over the world. The European experience of creating clusters which is one of the most successful in the world is very unusual for Ukraine. The genesis of clustering in Europe passed the following stages. In 1968 the Directorate-General for regional EU policy was established. In 1975 the European Fund for Regional Development was created. In 1988 the Charter of regionalism was adopted, the Council of regional and local companies started to work. In 2000 during Summit in Lisbon the mandatory development of EU national programs of clustering was approved, «European Research space» (European Research Area, ERA) was established and «Regional Innovation Development Programme Systems» (RIC) was adopted. In 2007 during the summit in Brussels was endorsed the manifesto of Europe's clustering. In 2008 during the Stockholm Summit was announced the «European Cluster Memorandum». The main characteristic of the European model is establishing close interrelationships and interaction between the state and business. This phenomenon can be explained by the respect the country has among the European business environment. The country is perceived as a «guardian of the industry».

According to the European Cluster observation, there are about 2000 clusters in Europe Union, different by their structure, quantitative and qualitative composition. The biggest group is the regional clusters, which consist of enterprises and research centers that are located within a particular geographic area. All of them deal with the creation of innovative products. The diversity of European regional clusters is caused not only by their heterogeneity but also by a variety of approaches to the cluster development policy. Among them are European approach, national approach, regional approach, local and intracenter approach. The experience of clustering in some countries of European Union is represented in *table 1*.

Table 1

## European experience of cluster structures formation and development

Country	Drivers and preconditions for clustering	Measures to promote the formation and development of clusters	Adopted concept clusters	Peculiarities of cluster model implementation and development	Result of implementation
<b>Italy</b>	<p>The economy model was developed on the base of entrepreneurs associations, hired workers, country and banks, which gave rise to cluster structures.</p> <p>The «Italian model» of cluster development is formed as active cooperation of small, medium and big business enterprises.</p> <p>The strategy includes the relocation of technological processes to developing countries.</p>	<p>The government held the complex of financial and economic reforms.</p> <p>Different organizations like councils, institutes, departments was established to operate in support of entrepreneurship at different levels (macro-, mezo-, micro-).</p> <p>The strategy of the relocation of technological processes to other countries was introduced.</p> <p>The Association of Artisans, National Board of Private Enterprises was established.</p>	Intersectoral knowledge streams	Cluster development contributed to support the connection between representatives of small businesses.	Specialize in industrial clusters for the production of shoes, accessories, clothing, textile products. There are 72 clusters. Attracted 69 thousand enterprises, 600 thousand workplaces.
<b>Austria</b>	<p>Representatives of the Austrian economic school were involved in the process of managing the economy.</p> <p>The process of communication between research institutes and manufacturing units began to be actively stimulated.</p> <p>Cross-border clusters with Germany, Switzerland, Italy, Hungary</p>	<p>Experts involvement (experts, business schools) to participate in the prospects of cluster development analytics.</p> <p>The complex of financial and economic reforms.</p> <p>Development of the program (concept) of market reforms and clustering of the economy.</p> <p>Establishment of organizations (councils, institutes, departments), which act in support of entrepreneurship at different levels (macro-, mezo-, micro-).</p> <p>EU and EBRD financial support.</p> <p>State promotion of innovations.</p> <p>The strategy of technological processes transfer to other countries.</p> <p>Creation of the fund to support of industrial research.</p> <p>Creation of «competence centres.»</p>	Production networks, innovative networks, network interactions	Foreign companies influenced the development of the cluster model. The revival of the automotive industry was the result of successful cluster policy	Specialize in industrial clusters for clothing, textiles, shoes, food, automotive. 10 clusters unite 417 firms. Trans-border clusters with Germany, Italy, Hungary, Switzerland were created.
<b>Denmark</b>	<p>The approach to inter-corporate cooperation is proposed.</p> <p>The industrial complexes were investigated as separate economic systems in regional scale by industries. Ways of transfer of</p>	<p>Involvement of experts (experts, business schools) to analyze the prospects of cluster development.</p> <p>The complex of financial and economic reforms.</p> <p>Development of the program (concept) of</p>	Resource zones	Regional clusters were formed in traditional sectors of production on the base of new technologies.	Specialize in industrial clusters for the production of dairy products, fabrics, clothing, furniture, mobile communication.

	knowledge and technologies were analysed.	market reforms and clustering of the economy. Establishment of organizations (councils, institutes, departments), which act in support of entrepreneurship at different levels (macro-, mezo-, micro-). State promotion of innovations. Institute for small business development. The strategy of technological processes transfers to other countries.			Operates 29 clusters (40% of all firms in the country, providing 60% of exports).
<b>Finland</b>	At the end of the twentieth century, the production process changes in favor of the juice-processing branches. «Clustered Frameworks» were created – that is, the priority branches representing many competitive directions — the transition of the economy from the support of primary growing industries to the technology development.	Involvement of experts (experts, business schools) to analyze the prospects of cluster development. The complex of financial and economic reforms. Development of the program (concept) of market reforms and clustering of the economy. Establishment of organizations (councils, institutes, departments), which act in support of entrepreneurship at different levels (macro-, mezo-, micro-). The strategy of technological processes relocation to other countries.	As a unique combination of firms related to each other knowledge transfer	In cluster unions lead from different branches. New clusters are formed by interpenetration of existing	There are 9 clusters, which are the «cluster frame» of the economy. The main share of exports provide information and telecommunications clusters
<b>France</b>	The process of cluster associations formation and development was slower than in other European countries. Innovation activity was regulated centrally. The budget appropriations for the development of high-tech kinds of business was introduced, the support of scientific-research developments on the needs of the industry was carried out	Adoption of the programme on the structure and development of territories, created by the organization to manage this process. 99 projects of regional development programs, united production clusters system is developed and approved.	Pole competitiveness	Enterprises are concentrated around a large company	In total there are 144 clusters, 82 clusters are in the process of becoming (among them cluster in aviation in Toulouse). The leader is a perfumery cluster.

Source: developed by authors based on [18, pp. 185 – 190; 7, pp. 41 – 45; 12 pp. 68 – 71; 9, pp. 221 – 224; 10, pp. 131 – 132; 18, p. 191].

The study of industry clustering in the fields and analysis of cluster structures development of some Western European countries, has enabled to separate the following data (*table 2*) [14, 17, 19].

Table 2

Sectoral direction of industry clustering in western Europe

№ п/п	Base areas in creation of industrial clusters	Countries where industry clusters are created
1	Agroproduction and food production	Finland, Belgium, France, Italy, the Netherlands
2	Biotechnology and Bio-resources	France, Germany, United Kingdom, Norway
3	Oil and gas and chemical complex of mechanical	Switzerland, Germany, Belgium
4	Engineering and repair, electronics	Netherlands, Italy, Germany, Norway, Ireland, Switzerland
5	Energy	Norway, Finland
6	Education, Technoparks	Germany, France, Austria
7	Light industry	Switzerland, Austria, Italy, Sweden, Denmark, Finland
8	Wood-paper Complex	Austria, Sweden, Denmark, Finland

*Source: developed by authors.*

The experience of economically developed countries shows that a cluster policy should be conducted in areas of activity that define a perspective specialization of the region's economy and have a high potential for growth and competitiveness.

In Europe, the level of clustering is mainly allocated to Italy and the countries of the Baltic-Scandinavian region. Their main features are:

- developed cluster strategies covering many small enterprises (especially Italy);
- a high share of innovative products in traditional sectors (textile, furniture, leather-shoe clusters);
- highly developed pharmaceuticals, telecommunications, production automation tools, and other high-tech production;
- high positions on new trade-unions and new industrial designs.

Thus, the experience of the process proves that in the modern conditions of success in the primary sectors can be based only on the methods of integration. Effective development today is the process of moving not to separate enterprises, but to their association in groups, networks, clusters. For Ukraine, transformation into a technologically and economically developed country in the world is an objective and undeniable necessity. This experience is especially relevant. The new stage of the economic system of Ukraine sets up many new requirements, such as adaptation to the present world challenges and leading trends, development of qualitatively new approaches oriented on financial stakeholders innovation and investment activity due to cardinal changes in social and economic relations.

Taking into account the best world experience in the formation and development of cluster structures and peculiarities of the implementation of clustering processes and the state of industry functioning in modern conditions in Ukraine we offer the following conceptual scheme of constructing a clustering industry of the region (*fig. 1*).

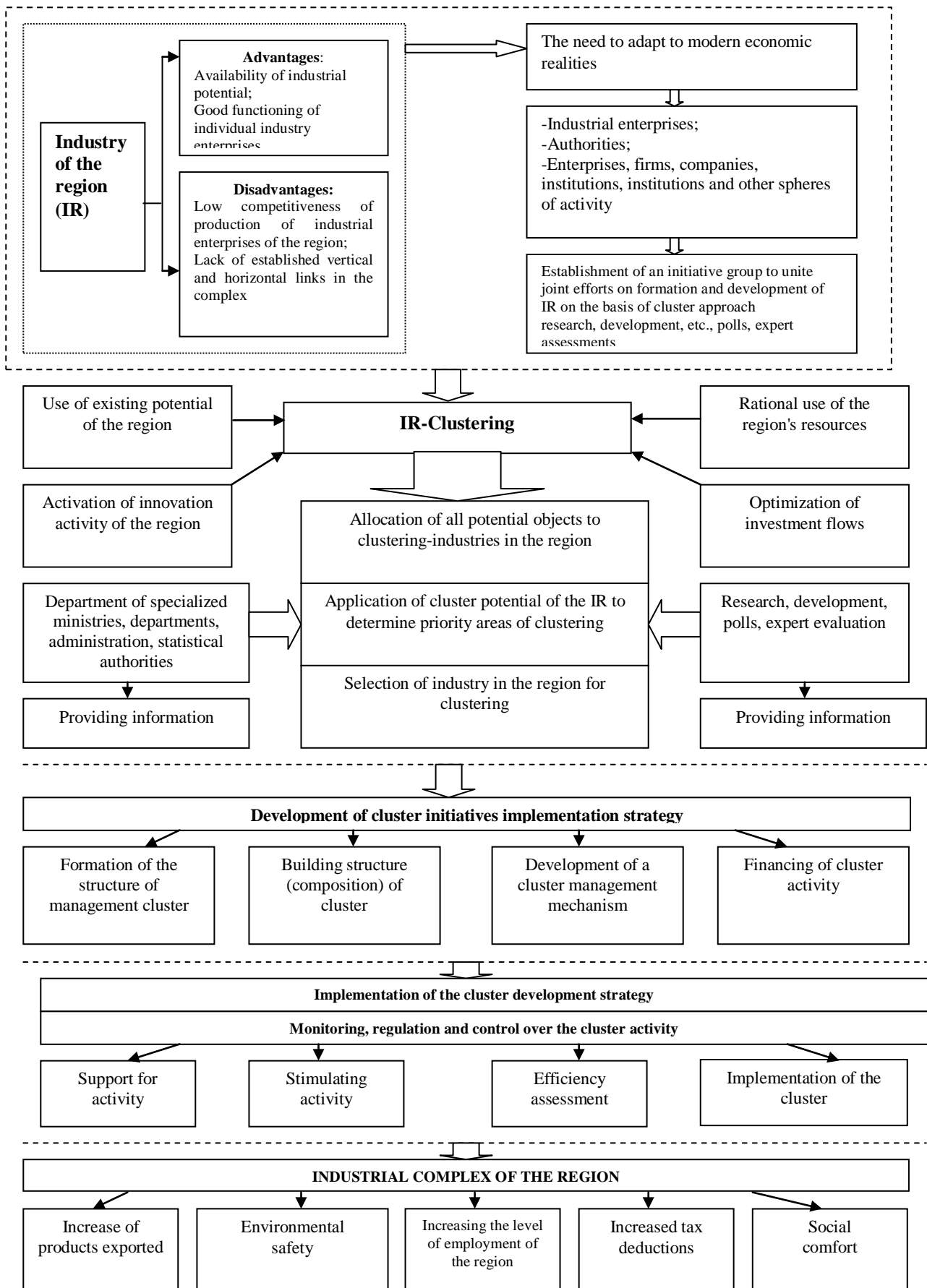


Fig.1. Conceptual scheme of formation and development of the industrial cluster of the region

Source: developed by authors.

**Conclusions.** In our opinion, further development of the industry of the region should be carried out in the direction of highly effective industrial complex formation, favorable to scientific and technical progress and adequate to modern world manifestations and trends that will ensure proper quality of life, a powerful motivation of labor and entrepreneurship.

The strategic focus of the regional industry development should include increase of social orientation at the region's industry; industries development in resource-saving direction, reduction of resources consumption such as power capacity of industrial production due to more complete and effective execution of own energy resources in the region; specialization in the national division of labor, acceleration of the industry development, direct industry potential to the internal market by implementing agreements on economic cooperation with other regions of the country, increase potential of the region and provide a worthy place on the foreign market; application of intensive factors to increase the efficiency of production activity of stakeholders, strengthening of their financial situation; increase of industry competitiveness and increase of innovative direction of its development.

Thus, we believe that the use of cluster approach for the formation and development of the regional industry will allow to solve many inherited and accumulated problems in industry development. It will also adapt it to the modern conditions of operation and apply the innovation and investment model of its growth to complete the strategic tasks mentioned above. Implementation of the proposed conceptual principles of cluster structures creation of the region, in this case, will develop not only the priority segment of the regional economic system, as the industry, but also the economy of the region as a whole.

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