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Clusters as a Mechanism for Solving Socio-Economic Problems of Post-Conflict Ukraine

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Abstract



The purpose of the article was to analyze the cluster strategy in various countries of the world and to highlight the legal instruments that can be used in the process of creation and operation of clusters in Ukraine, taking into account the existing post-conflict socio-economic problems. The research methods

used were: analysis, synthesis, consistency, comparison, generalization and prognosis, etc. The main models of cluster development in the world practice are analyzed. The characteristics of the state strategy in the field of regional clustering in the USA, Canada, Italy, Germany, Austria, France, Finland, Japan and China are studied. The authors focused on the legal instruments used in the process of creation and operation of clusters in different countries of the world, which it is advisable to borrow and implement in the Ukrainian legislation. Finally, the following problems of cluster creation in Ukraine have been identified: the lack of a legislative framework; a state strategy to support clusters, as well as incentives for investors. It is concluded that clusters in a difficult socio-economic situation in Ukraine should help to attract investments and develop the economy of regions affected by hostilities.

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Keywords: cluster; state strategy; socio-economic problems; world economic experience; investments.

Los clústeres como mecanismo para resolver los problemas socioeconómicos de la Ucrania posterior al conflicto

Resumen

El propósito del artículo fue analizar la estrategia de clústeres en varios países del mundo y resaltar los instrumentos legales que se pueden utilizar en el proceso de creación y operación de clústeres en Ucrania, teniendo en cuenta los problemas socioeconómicos existentes del posconflicto. Los métodos de investigación empleados fueron: análisis, síntesis, consistencia, comparación, generalización y pronóstico, etc. Se analizan los principales modelos de desarrollo de clúster en la práctica mundial. Se estudian las características de la estrategia estatal en el campo de la agrupación regional en EE. UU., Canadá, Italia, Alemania, Austria, Francia, Finlandia, Japón y China. Los autores se centraron en los instrumentos legales utilizados en el proceso de creación y funcionamiento de clústeres en diferentes países del mundo, que es recomendable tomar prestados e implementar en la legislación ucraniana. Finalmente, se han identificado los siguientes problemas de creación de clústeres en Ucrania: la falta de un marco legislativo; una estrategia estatal para apoyar los clústeres, así como incentivos para los inversores. Se concluye que los clústeres en una situación socioeconómica difícil en Ucrania deberían avudar a atraer inversiones y desarrollar la economía de las regiones afectadas por las hostilidades.

Palabras clave: clúster; estrategia estatal; problemas socioeconómicos; experiencia económica mundial; inversiones.

Introduction

The study of the strategy of clustering in foreign countries demonstrates that clusters are a significant impetus for the development of the region, and therefore it is advisable to apply this mechanism to solve the problems of the post-conflict regions of Ukraine. Clusters in Ukraine can become an effective mechanism for attracting investments from national and foreign investors, as well as for the integration of Ukrainian manufacturers into the world market of high-tech products and technologies.

Clusters will make it possible to increase the efficiency of the potential of post-conflict regions of Ukraine, to activate entrepreneurial activity especially in the innovative sphere. However, to accomplish this, it is necessary to provide an incentive mechanism for entrepreneurs:

The advantages of the processes of clustering for participating countries are also as follows: a more efficient use of the potential of individual regions, diversification of the regional economy, growth in the number of taxpayers and expansion of the tax base, activation of the partnership dialogue "business - authorities", reduction of the budget dependency on some monopolistic business units (Kochanska *et al.*, 2016: 26).

Clusters are an effective mechanism for increasing the level of competitiveness of certain regions of Ukraine. As a result, the formation and development of clusters in Ukraine, particularly in the post-conflict period, is a necessary condition for increasing the socio-economic level of the state. In this regard, the process of clustering is multifaceted, the cluster policy of the state must be elaborated taking into account specific features of the socio-economic and political development of the state.

The purpose of the article is to analyze the cluster strategy in the world countries and to distinguish legal instruments that can be used in the process of creating and functioning of clusters in Ukraine taking into account the existing socio-economic problems of post-conflict Ukraine.

Based on the specified purpose, the following tasks have been solved in the article: the main aspects of implementing the state strategy in regard to the creation and functioning of clusters in such countries as: USA, Canada, Germany, Austria, Italy, France, Finland, Japan, China are analyzed; legal instruments that can be used by the Ukrainian legislator while creating clusters in Ukraine and that will contribute to the solution of socio-economic problems existing in Ukraine are studied.

1. Methodology of the study

The authors of this study used the dialectical method of cognition and a number of general scientific special methods of scientific research. Thus, the method of monographic analysis has assisted to clarify those issues that are relevant and are being researched by scholars and covered in scientific publications. The method of analysis and synthesis has made it possible to generalize the existing definitions of clusters, which has made it possible to single out the peculiarities of clustering in the region.

The application of the system method has made it possible to systematize the state strategies that are used in global practice regarding the clustering of regions. The method of economic and legal analysis has been applied to single out the legal instruments that are used in the process of creating and functioning of clusters in world practice and that make sense to implant in the legislation of Ukraine to solve the socio-economic problems of post-conflict Ukraine. The method of generalization has made it possible to draw conclusions based on the conducted research.

2. Results and Discussion

2.1. Analysis of the concept and features of clustering in the world practice

There is no single approach in the scientific literature to define a cluster, which is due to the lack of a single, generally accepted model of clustering of the territory, but there are common features that unite different types of clusters.

There is no one cluster model as each is exceptional in its own way and managed differently, with other relations between associated entities, as well as each of them requires an individual scope of supporting actions. Notwithstanding various perspectives that define this issue, following the presentation of various approaches, we can indicate three basic areas as the structural core of the idea of clusters, which relate to: spatial concentration of entities, their mutual competitiveness, as well as mutual interactions of relations between participants (Piątkowski, 2015; 316).

- M. Porter, who is believed to be an ideologist of cluster development, introduced the concept of a cluster defining it as a group of interrelated companies and related organizations concentrated in a certain area in a relevant industry (Porter, 1990).
- T. V. Tsihan offers three definitions of clusters, each of them demonstrates the main feature of cluster functioning: 1) regionally limited forms of economic activity in adjacent sectors, which are mainly associated with one or another scientific institution (research institute, University); 2) vertical production chains. These are rather narrowly defined sectors, where adjacent stages of the production process make up the core of the cluster; 3) industries defined at a high level of aggregation (e.g. "chemical cluster") or a set of sectors at an even higher level of aggregation (e.g. "agroindustrial cluster") (Tsihan, 2003).

Clusters are local concentrations of horizontally or vertically connected companies that are specialized in related areas of business together with supporting organizations (Business clusters: promoting enterprise in central and Eastern Europe, 2005).

O. Sölvell defines cluster initiatives as organized efforts aimed at increasing the growth and competitiveness of clusters in a region, which includes cluster companies, government and/or research institutions (Sölvell *et al.*, 2003). Clusters, on the one hand, create cooperation, and on the other, stimulate competition at the market, which benefits all participants. Therefore, innovation clusters provide an impetus for further development of regional centers of excellence and primarily serve as a tool for the development of existing strong points (Mauroner, 2015).

Summarizing the existing definitions of clusters, it is possible to single out the peculiarities of region's clustering:

- territorial localization of the cluster;
- clusters unite manufacturers, suppliers, research organizations, consulting companies, credit organizations, infrastructure companies and other participants;
- the presence of a leading enterprise that determines the economic strategy and directions of economic activity of the entire cluster system;
- the stability of economic relations of cluster participants;
- availability of relationships and coordination of the interaction between cluster participants.

The conducted research shows that three main models of cluster development have been formed in the world practice: North American (for example, the USA, Canada); European (for example, Germany, Austria, Italy, France, Finland) and Asian (for example, Japan, China).

When implementing a cluster strategy in the North American region, the state and business separate themselves from each other, in Europe the state interacts with entrepreneurs, and in the Asian region the state tries to penetrate directly into the structures of large private companies" (Karpenko, 2011; 45).

Examples of successful clusters in the USA are: Silicon valley, where computer technologies and other high-tech products have been developed; Detroit, which is known for manufacturing cars; New Mexico, which is a center of nanotechnology, biotechnology, renewable energy sources; Medical Alley, where medical technologies have been developed; Nuclear Energy Modeling & Simulation Energy Innovation Hub, which is known for the development of nuclear technologies; Magnolia Business Alliance, where the energy industry is being developed.

Most of the relationships in the USA are mediated by the market, developed competition between companies is the main factor in the development of clusters of the North American model. Scientific and technological partnership has been widely developed in the US clusters,

there is provision of loans and preferential taxation of companies that carry out scientific research and development programs.

Canada has experience in implementing the following cluster initiatives: biotechnology cluster (Montreal, Toronto, Vancouver, Ottawa, Halifax); information and telecommunications cluster (Vancouver, Calgary, Quebec, etc.); high-tech clusters (Montreal, Ontario, etc.); multimedia cluster (Montreal, Toronto, Vancouver); winemaking cluster (Niagara) and others.

Support for business cluster initiatives is provided in Canada at all government levels – federal, regional and municipal. However, specific forms of support vary at each level. There is no single concept of cluster policy implementation at the federal level in Canada.

The main role of the government should be to establish general rules, and the implementation of specific cluster initiatives can be entrusted to the administrations of provinces and municipalities. At the same time, the cluster strategy is part of the country's national innovation strategy. This strategy is coordinated by the National Research Council (NRC), the leading federal agency for research development.

A distinctive feature of regional cluster initiatives formed with the participation of the NRC is that all clusters are included into networks that go beyond their regions. In addition to the NRC Technology Cluster Initiatives at the federal level, the Canadian government provides support to clusters in the implementation of investment attraction policies, promoting the sale of company products at foreign markets, regulating the labor market, investing into promising scientific research and development projects, creating educational programs, protecting intellectual activity, etc.

Canada's cluster policy varies on the basis of priorities of federal, provincial and local authorities and often ranges from tax incentives for the private sector to such projects as the "Innovation Supercluster Initiative". Canada is now globally recognized for its extraordinary investment of 950 million US dollars into five superclusters, which consist of a series of related clusters and industries (So *et al.*, 2019).

Consequently, clusters in Canada have been widely developed and have support at all government levels: federal, regional and municipal. There are tax incentives for the private sector and large investments by federal agencies in the development of innovation superclusters.

Studying the European model, it can be argued that there is an active development of cluster policy, which has a positive effect on the competitiveness of regions and contributes to the creation of technological chains. An example of a successful European cluster is The Software Cluster in Germany, which involves Universities and research organizations in software development.

The German government has been paying more and more attention to cluster initiatives since 2003. First of all, it is applied to projects on the creation and development of clusters in the field of high technologies, where the state supports the consolidation of efforts of industry and scientific centers (Sölvell *et al.*, 2003).

Financial incentives are provided for clusters in Germany and there is a merger of private and public cluster participants, which allows achieving high results.

In Germany, for example, a very interesting experiment was launched in the early 1990s with the BioRegio-Competition. The federal government offered financial support for the three regional biotech clusters that could most convincingly demonstrate that they had the critical assets, the plan, and the willingness to upgrade their cluster. Much beyond the financial incentive the mere process of getting the relevant private and public cluster participants together proved to be an important step in getting Germany to become the leading European location – alongside the UK – for biotechnology (Ketels, 2004: 3).

Analysis of cluster activity in Germany allows us to state that there is state support for the consolidation of industry and scientific centers, the unification of private and public cluster participants, as well as financial stimulation of cluster activity.

The cluster policy gave a significant impetus to the economy of Austria, where cross-border clusters with Germany, Italy, Switzerland, and Hungary began to operate, and relations with France and Great Britain were intensified. The key factor was the policy of stimulating the development of relationships between research institutes and the industrial sector, reducing regulatory barriers within innovation programs, specialization of clusters and the formation of competitiveness centers (Kyzym *et al.*, 2011).

Consequently, cross-border clusters have developed in Austria, the development of relationships between research institutes and the industrial sector is stimulated, and regulatory barriers in the process of implementing innovation programs are reduced.

The widely known Cosmetic Valley cluster was founded back in 1994 in the Aire-et-Loire region in northern France. The cluster includes such market giants in the field of cosmetics and perfumery as Maybelline, Yves Saint-Laurent, Shiseido, Christian Dior and Guerlain (Sylvie, 2017). Cluster policy in France is implemented by bringing together business, the scientific community and educational centers.

At the same time, all organizations develop their own strategy, which does not contradict the regional development strategy. Close interaction with the regional authorities plays an important role in this process. Thus, France has the interaction between large, medium and small enterprises and the consolidation of efforts of industrial enterprises and scientific

centers, as well as the system of incentives for the development of high technologies is also applied.

The Italian model envisages a cluster that creates small and mediumsized enterprises of a similar volume of production and a high level of specialization. This model has no leader and all enterprises are both contractors and competitors (Gorynia and Jankowska, 2008).

The strategies of Italy's clusters – the biomedical cluster in Mirandola and the ceramics cluster in Sassuolo – are based on innovation and internationalization. The biomedical cluster in Mirandola is characterized by internationalization through alliances with external leaders. Innovation and investments in tangible and intangible assets play their role in both processes: production processes and distribution strategies in Sassuolo, as well as research capacity and collaboration with Universities and research centers in Mirandola made it possible for both clusters to integrate global markets. It demonstrates the variety of strategies available to industrial regions and clusters to address competitive challenges (Labory and Prodi, 2014).

Thus, the promotion of clusters in Italy is essentially the support of small and medium-sized businesses in the industrial regions of the country; a distinctive feature of clusters in Italy is the system of incentive mechanisms for attracting investments, which is enshrined in legislation.

The cluster approach is popular in Finland. The most developed cluster and the basis of exports of the Finnish economy is the woodworking cluster. The supporting industries for it are mechanical engineering and the chemical industry, which are also clustered. All key industries, where the main volume of added value is created, are clustered.

The peculiarity of the Finnish economy is the fact that it does not have a large stable demand at the domestic market. Therefore, clusters in the country are export-oriented.

The forest, information and telecommunication clusters are currently the most important for the Finnish economy, providing the main volume of exports and forming a significant part of the country's gross domestic product. The pulp and paper, wood processing companies of the forest cluster have long implemented a global development strategy, actively buying companies abroad, and have one of the highest levels of labor productivity in the industry both domestically and in the world (Pyatinkin and Bykova, 2008: 27).

Finland clusters are most represented by business internationalization – there are dense relationships with neighboring companies, such as Sweden, the Baltic Sea countries. On this basis, clusters in Finland's economy are not exclusively national. The basis of economic growth of the country's economy that does not have significant reserves of natural resources is a high level of innovation, which appear due to the widely developed educational and

scientific sectors that is also the result of effective state support (Kyzym *et al.*, 2011).

Finland's experience testifies about the positive role of cluster economy, not isolated companies. The cluster system is the driving force for the development of Finland's economy, where both national and international clusters are present, there is a state policy of cluster support and there is an export cluster orientation.

European countries use different legal instruments, including stimulating cluster enterprises, at the state and at the local levels. This allows you to attract investors to develop the regions that need help.

Governments in Central, Eastern and South-Eastern Europe have realized that in order to achieve sustainable economic growth and to promote balanced regional economic development, it is important to encourage entrepreneurship at the local level. Clusters that require interaction between entrepreneurs and local institutions, cooperation at both local and federal government levels, and coordination between different political spheres can dynamize their local economy. As a result, cluster policies and initiatives have recently increased (Business Clusters: Promoting Enterprise in Central and Eastern Europe, 2005).

The Asian region has developed its own special type of clusters, which is characterized by the features of the European approach, but at the same time there is also a purely Asian specificity. The development of regional clusters in the Asian model occurs both at the expense of investments and through active state support. One of the first and largest clusters in Japan – Sapporo Valley was created on the basis of the University community engaged in software development.

The Japanese model is formed around a leading company with large-scale production that integrates many suppliers at different stages of the chain; it is used for the production of technologically complex products. Product development requires high stable expenses, which can pay off only with a large volume of sales (Prokhorova *et al.*, 2018).

One of the examples of the process for creating clusters in the Japanese economy is the Toyota cluster, which was founded by creating the system of subcontracting relationships between a number of large, medium and small enterprises.

The "Knowledge cluster initiative" Program is active in Japan, which stimulates the development of clusters in 18 regions of the country. Support is provided to joint projects, where regional Universities act as the core of clusters formed by a network of small innovative companies and large industrial companies (Lenchuk and Vlaskin, 2010).

Therefore, Japan has a concentration of medium and small enterprises around a large company, a mechanism for stimulating the development of highly specialized regions is provided, and the import of modern technologies is also encouraged.

Different industry clusters have been developed in China. For example, investment in China's automobile industry has resulted in the formation of motor transport clusters with a wide network of suppliers in the country, research base, engineering companies and innovation centers. The process of creating and developing clusters in China involves three government levels: central, regional and municipal.

A municipality can create a zone for the development of high-tech industries on its territory with the approval of the central government. The central government also has the function of selecting companies worth of special preferential measures. Besides, cooperation between business and Universities is encouraged in every possible way, which is of great importance for the emergence of own technological innovations and raising the technological level of products.

Specific features of the state strategy in the field of regional clustering in different countries of the world are shown in Table 1.

Table No.1. Peculiarities of the state strategy in the field of regional clustering in different countries of the world

Country	State strategy regarding clusters
USA	 Provision of loans; Prederential taxation of companies that carry out research and development programs within the framework of the cluster;
Canada	 Support at all government levels: federal, regional and municipal; Tax incentives for the private sector; Large investments by federal agencies in the development of innovation superclusters
Germany	 State support for the consolidation of industry and scientific centers; Unification of private and public participants of the cluster; Financial stimulation of clusters
Austria	 Development of cross-border clusters; sector; Stimulation of relationships between research institutes and the industrial sector; Reduction of regulatory barriers in the process of implementing innovative programs
France	 Interaction of large, medium and small enterprises; Consolidation of efforts of industrial enterprises and scientific centers; Application of the system of incentives for the development of high technologies

Italy	1. Support of small and medium-sized business in the industrial areas of the country; 2. The system of stimulating mechanisms to attract investments through the system of clusters
Finland	 Presence of both national and international clusters; State policy of supporting clusters; Orientation of clusters on export
Japan	 The mechanism for stimulating the development of highly specialized regions; The import of modern technologies is encouraged
China	 Three levels of government are involved in the creation of clusters: central, regional and municipal; There are special privileged measures; Cooperation between business and Universities is encouraged

Source: compiled by authors.

Thus, the experience of the USA, Canada, Italy, Germany, Austria, France, Finland, Japan, and China shows that cluster initiatives have proved their positive contribution into the economic development of regions, since success in the modern instability conditions can be achieved only through integrations. The creation of clusters encourages the economic development of the region, starts the process of synergy and allows the effective use of the natural and human potential of the region.

The interaction of manufacturing enterprises and scientific centers, state and private enterprises within clusters contributes to the growth of employment, investment attractiveness, accelerates the process of spreading advanced technologies in the national economy. At the same time, state support and incentive mechanisms are used for the development of the cluster system, which helps to attract entrepreneurs and investors, promotes the creation of clusters in various regions.

Stimulating and supporting clusters are important programs for governments and other public entities. Cluster development initiatives are actually an important area in economic policy considering the previous efforts in regard to macroeconomic stabilization, privatization and market opening, as well as reducing the expenses on business operations (Mauroner, 2015).

2.2. Specific features of cluster policy in Ukraine

Clusters are also created and function in Ukraine. For example, the "Podillia First" Program has been implemented since 1998; regional clusters of sewing, agricultural and processing enterprises, as well as construction companies and manufacturers of building materials were created in the Khmelnytskyi region within the framework of this Program. A clustering process of the regional economy was observed in Odesa, Kherson, Ivano-

Frankivsk, Zakarpatska and Lviv regions at the beginning of the XXI century.

This process took place with the support of local authorities by combining the efforts of business and science in such sectors of the economy as tourism, construction, agricultural activity, and consumer goods industry.

The functioning of clusters has led to positive structural changes in different regions of Ukraine. However, the lack of a legislative framework, a state strategy to support clusters, incentive mechanisms and other reasons did not allow clusters to become a driving mechanism for attracting investors to Ukraine.

The analysis of world experience regarding the implementation of the cluster strategy allows us to single out a number of features that are useful for increasing the efficiency of cluster activities in Ukraine. The formation of a cluster is a natural stage in the development of a country's economic activity, since the use of a cluster approach is perceived as the main characteristic of countries with a highly developed economy.

There is no single cluster management model. Therefore, it is necessary to adapt the management of the cluster to the specifics of each country and each cluster by creating a highly effective environment for the cluster's functioning.

The cluster system is able to develop business relations not only within the borders of one state, but also at the international level. This allows exchanging experience, technologies, and developing interaction between clusters.

The cluster promotes competitiveness through innovation, helps coordination and integration of all interested participants. The integration of business structures can be carried out in various forms by using various mechanisms, whose choice depends on the specifics of production, the market situation, economic conditions, etc.

To solve existing problems that Ukraine has at the present time according to the difficult socio-economic situation, it is necessary to use legal instruments that have proved positively themselves in the world practice. It is advisable to borrow and implement into the legislation of Ukraine those positive developments in the field of creation and functioning of the system of clusters that exist in various countries of the world, namely:

1) in the USA – the system of providing loans, as well as stimulating mechanisms for the taxation of companies that carry out scientific research and development programs within the cluster; 2) in Canada – the system of tax incentives for the private sector; 3) in Germany – the system of financial stimulation of clusters, the mechanism for uniting public and private cluster participants; 4) in Austria – the procedure for reducing regulatory barriers

in the process of implementing innovation programs; 5) in France – the system of incentives for the development of high technologies; 6) in Italy – methods of supporting small and medium-sized businesses, stimulating mechanism for attracting investments; 7) in Finland – the mechanism of state support for clusters; 8) in Japan – the system of incentives for the import of modern technologies; 9) in China – the mechanism for encouraging cooperation between business and Universities inside the cluster.

In our opinion, the further development of the system of clusters in Ukraine should be carried out in the direction of the formation of a highly effective favorable environment for scientific and technical progress, which is adequate to the modern problems of Ukraine. The cluster system is aimed at the interaction between state authorities, local self-government agencies, business and research institutes.

Strong relationships between business structures and research institutes characterize regional clusters. Research institutions can play an important role in promoting the transparency needed to foster innovation and to attract investments. This makes it possible to strive for excellence and raise the level of all participants.

Therefore, we believe that the use of a cluster approach to solve existing socio-economic problems in Ukraine will allow solving many accumulated problems. It is necessary to use intensive factors to ensure the efficiency of the use of clusters, increase competitiveness and increase the innovative direction of the development.

Implementation of the suggested conceptual principles of creating cluster structures will allow developing both the regional economic system and the economy in general. The ability to continuously evaluate will provide an opportunity to ensure the improvement of the cluster's operation.

Conclusion

The conducted research allows us to make the following conclusions:

- Clusters have received development in various countries of the world, including the USA, Canada, Germany, Austria, Italy, France, Japan, China and others, and have positively proved themselves at the regional and state levels.
- 2. Clusters have assisted to revive the economy of regions, to encourage investors, to develop high-tech industries, and to create new jobs.
- 3. In terms of a difficult socio-economic situation in Ukraine, clusters can become a mechanism, which helps to solve a complex of problems,

- namely: attraction of investments, development of the economy of regions affected by hostilities.
- 4. Clusters are currently being created in Ukraine. However, there is no legislative framework, a state strategy for supporting clusters, incentive mechanisms for investors not allowing clusters to become a driving mechanism for the recovery of Ukraine's economy.
- 5. It is necessary to borrow various mechanisms, which allow using clusters to attract investments and activate economic processes in the region, from different world countries and implement them into Ukrainian legislation.

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