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Review of scientific literature in the context of cluster development problems in the system of provisions of the concept of sustainable development

Introduction

The companies competing on their own are characterized by less stable market positions than a group of companies in the long term. Entrepreneurship is a natural process, a kind of symbiosis of communication and transfer, which ensures the distribution of resources between market participants. Accordingly, IC is one of the entrepreneurial interaction forms that is characterized by an improved mechanism of market expansion in the global economy. Given this, it is relevant to manage the development of innovative clusters that would be sensitive to the factors affecting the innovative clusters' competitiveness.

The emergence of innovation clusters (IC) is one of the natural economic phenomena formed due to the presence of appropriate circumstances. The main circumstances of increasing the concentration of a certain type enterprises on a certain territory is usually associated with cultural, historical and geographical features and is based on high entrepreneurial activity. The government decisions to a certain extent can only influence the long-term historical process of forming an entrepreneurial culture in the region, since most economic strategies of regional development are focused on a period of up to 5 years, while forming IC can last for decades. An example of the historical circumstances of IC origin is the clusters of the textile industry in Italy (the districts of Bologna and Milan), in which this industry has been dominant for a long time due to its historical and cultural characteristics. As a result, the concentration of entrepreneurs working in this market grew rapidly, which contributed to IC origin. Another example is Silicon valley (a district in California, USA) formed under the influence of new technologies origin and the enthusiasm of young entrepreneurs who were the first to understand the market potential of new technologies. IC is nothing more than a competition evolution product, as the economic development dominant factor, which requires the management on a systematic basis.

The purpose and objectives of the study

The purpose of the study is to identify the factors of direct and indirect influence on the competitiveness of clusters on the basis of literature review. The tasks were to study literary sources on the problem; establishing relationships between factors.

Review of previous studies

We begin our research on the development of innovative clusters with a critical review and analysis of literary sources. Thus, over the years of Ukraine's independence, nearly fifty theses have been devoted to the problems of cluster development, of which more than two dozen theses have been devoted to the researched topics. Among them are the following scientific works: [46].

1. Scientists consider problems of cluster development at the following levels: national economy [25]; regional economy [11], [24]; economics of business structures [26], [42]; activities [18].
2. Some scientific works are devoted to solving problems on several levels: national and regional [16]; global and national [21]; regional and micro level [47].
3. Based on the review and analysis of the literature, we can say that the problems investigated by scientists are quite diverse. Among the most common vectors are the following: International economic relations and the world economy [46]; investment [27] and innovative activity [46]; ecology and nature management [44]; labour resources and labour migration [48]; competitiveness [40].
4. The polyvector nature of the problems studied is also related to the number of local environments in which these studies were conducted, referring to particular types of economic activity and types of production, namely: machine-building industry [36]; food industry [14]; tourism sphere [24]; the coke industry [5]; forestry [31]; trade [3]; woodworking industry [40]; hardware production [7]; coal industry [43]; textile industry [16]; postal service [30]; production of non-metallic building materials [41]; cable industry [37].
5. According to the results of the review and analysis of literature sources, it was also revealed that, despite the diversity of research levels, objects and vectors of research, in general, the subject area of scientific work of domestic scientists devoted to clusters were: potential of clusters [40]; development [25], [24]; management of clusters [20], [11]; regulation of clusters [12]; formation of clusters [26], [24]; evaluation of clusters [18] or other objects (national economy, regions, activities) under the influence the emergence and development of clusters.

Given that our research focuses on the problems of the national economy, the greatest interest is caused by scientific works on the macro level, in particular, the state regulation of various aspects of cluster development in Ukraine. Among them, a noteworthy view is the problem of the development of Dudkina, K.A.'s clusters, who examined the cluster model of market centralization through the lens of market mechanisms and instruments of state regulation. The author has proved that globalization influences the existence and activity of modern clusters, and also offers a set

of recommendations and new approaches to stimulate the development of clusters in Ukraine [17]. Dubkina, K.A.'s position was continued in the research of Kanishchenko, N., who improved the theoretical, methodical and practical provisions concerning the formation and functioning of clusters in Ukraine. The author argues strongly that the cluster form of business development is an effective tool for increasing the competitiveness of the national economy. On the basis of improvement of the comparative analysis method of development stages and mechanisms of effective use of economic advantages of clusters at micro-, meso- and macro-levels the author has identified and specified the structure of economic interests of cluster participants and described mechanisms of formation of cluster associations on the basis of determination of basic market tendencies, organizational principles and forms of interaction of cluster participants [23].

An important problem for the development of innovation clusters in the structure of the national economy is the content and vectors of state industrial and innovation policy. Galvinm, P., on the example of local governments in Canada, exposed the economic-managerial nature and legal role of the state in the implementation of innovation policy within the cluster paradigm.

The author has addressed the issue through the lens of a multi-level approach to management in key industries in Toronto. Several factors have contributed to the lack of development between the two levels of government and the institutions involved. This revealed the reasons for the inhibition of the development of effective multilevel co-governance institutions in the sectors studied [11]. According to the author, the effectiveness of industry clusters as well as the effectiveness of innovation policy implemented by public authorities depends on the availability of institutions that are designed to develop and implement such policies. At the local level in Canada, for example, the Toronto Trade Council. The author argues for the creation of a similar body in Montreal, the Regional Economic Development Agency [11]. The same opinion was developed by Belarusian scientists Korotkevich, A., Karachun, I., Marushka, D. and Vashchyla, H., who see a decisive role in the implementation of state innovation policy in the formation of technology parks, clusters and innovation networks [25].

Other scholars Edmunds, L.D., Gluderer, S., Ovseiko, P.V. et al. focus on the importance of symbiosis of interaction and dialogue among universities, governments and industries in order to achieve innovation in local projects. Scientists note: "... as long as the European Union is aspiring to become an Innovation Union, there is still a lack of quantitative indicators to compare and compare regional innovation clusters. To address this, the HealthTIES consortium was funded by the European Union's Knowledge Regions initiative, FP7's research and innovation funding programme. HealthTIES tested whether the innovation cycle of medical technologies works differently in the five European regional innovation clusters, and suggested regional and joint actions to improve their effectiveness..." [18]. As a result of the research, scientists have come to the conclusion that important sectors of the economy, such as medical sciences and life sciences, are increasingly revolving around the "triple helix" of university-industry-government relations, both at national and

regional levels. It is important that research and innovation stakeholders and policy makers have access to tools for measuring, monitoring and comparing the triple helix dynamics in key sectors. HealthTIES indicators and indices provide useful practical tools for measuring and comparing university, industry and government innovations in European medical classes and life sciences [18].

In Gornik, V.G.'s study mechanisms of state industrial policy on the basis of captive and semi-captive funds creation of innovative developments for use in the system of internal financing of product producers are presented. The author has formed a set of practical recommendations for improving the state financing of innovative projects, in particular within the framework of cluster construction of innovation and investment activities [13]. On the basis of the works of Gornik, V.G., other Ukrainian scientists – Borisenko, M.B. and Volosyuk, M.V. examined the national management of cluster development at both national and regional levels. Thus, Borisenko, M.B. analyzed industrial-innovation policy as a component of mechanisms functioning of state management of industrial branch. This has become the basis for substantiating the benefits of a cluster approach in public industry management at the regional level. Considering clusters as an innovative form of regional industrial complex Borisenko, M.B. specified the regional structure of industrial cluster development management and substantiated the directions of reforming the organizational and legal mechanism of state management of innovative development of regional clusters [6]. In turn, Volosyuk, M.V. developed an organizational and institutional system for forming effective mechanisms of the state regional industrial-innovation policy in Ukraine, and also proposed a strategy of industrial-innovation policy at the regional level. The author also substantiates, based on the expected synergistic effects, variational models of interaction of large corporate cluster structures with regional authorities and local self-government [10].

The problem of formation and implementation of the state innovation policy on the basis of the cluster paradigm was addressed by Lazutin, G.I., who substantiated the theoretical and practical principles of the formation and implementation of the state innovation policy, taking into account the correspondence of the phases of innovation cycles to “long waves” of economic development. On the basis of the analysis of the influence of information components on the process of social reproduction and information and financial factors on the relationship between the subjects of innovation activity, the author has substantiated the necessity of applying a cluster approach for the innovative development of the national economy [28]. The position of Lazutin, G.I. was developed by Avdeeva, V.M., who argued that in modern business systems, enterprises can participate in the relationship of competition and cooperation at the same time. The researcher found that the creation and operation of clusters in networked business structures contribute to the development of cooperation. The author argues that increasing the efficiency of Ukrainian business requires state support, but over-regulation of business leads to increased administrative costs and impedes economic growth. An approach to reducing administrative costs within the relevant

state structure in the context of harmonization of national legislation with the legal provisions of the European Union has been proposed [1].

From the point of view of realization of national economic policy there advocated Myagkova, O.V., Mohammed Sobhi Kdeir Havamleh, Ostapyuk, N.I., Belyaeva, M.V. and Pain, M.M. In their works they covered quite successfully those aspects of state regulation of the development of clusters that relate to particular types of economic activity (industries), in particular mechanical engineering, tourist activity and trade. In this regard, the studies of Audretsch, D.B., Feldman, M.P., who proved that: "... empirical evidence indicates that the propensity to innovate is formed at the stage of the industry life cycle. Although the generation of new economic knowledge tends to lead to a greater tendency for innovation to cluster early in the life cycle of an industry, innovation tends to be more widespread in the mature and declining stages of the life cycle, especially with regard to location, as far as location of production is concerned..." [2]. Continuing this view, Johansen, F.R., Kerndrup, S., Andersson, G., & Rubach, S. state that "... creating clusters... enhances business competitiveness and promotes local development... clustering is a process of contour development, with knowledgeable actors, carefully shaping opportunities and artifacts, creating opportunities... The power of potential of cluster projects and programs lies in frameworks, tools and methods, more than funding..." [22]. Wakim, W. drew attention to the fact that in the context of the development of certain types of economic activity (industries), it is an important function of public authorities to create the conditions for the emergence of a so-called special economic regime. The author notes that the main elements of a special economic regime are, as a rule, state aid, additional guarantees of the rights of economic entities and privileges. The special mode of innovation activity should be aimed at realization and protection of interests of participants' innovation activity and minimization of risks that accompany these activities. However, the author emphasizes the impossibility of a special mode of innovation in the form of a universal constant that would be equally effective for all objects of such a mode. Therefore, it is appropriate to take into account the specificity and potential of the creation of certain innovative products or technologies when designing specific modes of innovation. According to Wakim, W. the key factors for the formation of special economic regimes in the field of innovation should be the development of the national innovation system and, in particular, its infrastructure element, the development of legislation in the field of cooperation among themselves and other economic entities and the formation of innovation clusters [8].

Investigating the issues of cluster development by individual types of activities (branches), a comprehensive program of state anti-crisis regulation of machine building development in Ukraine has been developed by Myagkova, O.V. on the basis of a cluster approach to the choice of a model of machine building development and programme-management dendrite of the problems of crisis development of the industry. Also noteworthy is the author's approach to the mechanisms of cluster formation on the basis of cooperation of machine-building enterprises [34]. Belyaeva, M.V. proved the feasibility of applying clustering in trade in conjunction with the development of

credit unions of small business entities in retail trade [3]. Other of the above scholars have conducted research in the field of tourism, in particular Mohammed Sobhi Kdeir Havamleh considered the state regulation of the development of clusters in tourism in terms of national competitive advantages [33], Ostapyuk, N.I. researched the state regulation of the development of clusters in the tourism industry, taking into account the environmental factors [35], and Bille, M.M. formed a structural and functional model of tourism industry management on the basis of building vertical and horizontal links of state authorities at the national, regional and sub-regional levels [5].

The influence of the cluster form of entrepreneurial activity on the possibility of solving environmental problems was investigated by Gakhovich, N.G., Podsolonenko, M.V., Smagliy, V.O., Mishenina, G.A., Golovko, L.V., Bystryakova, Yu. I., and Rachinsky, O.S., Badik, N.M. and Andryushchenko, K.A. Thus, Gakhovich, N.G. proved that greening is a category of socio-economic relations, which reflects the relationship of human industrial activity with the state of the environment through the level of man-made load. This scientist has scientifically substantiated the opportunities and advantages of network organization of works on greening industry by creating regional and inter-regional ecological clusters, proving that targeted changes in the industrial structure of industrial production can become a significant factor in regulating the ecological component of industrial development [12]. Podsolonenko, M.V. proposed the substantive structure of personnel and competence support of the processes of creation and functioning of small enterprises within specialized networks of recreational complexes and clusters. The author proved that his model of interaction of networks of specialized small enterprises in the composition of recreational clusters will allow local governments and the population to choose activities reasonably in the general system of recreational entrepreneurship [38]. Smagliy, V.O. researching regional agro-chemical clusters was able to develop a model of achieving ecological and economic efficiency of the development of these clusters based on indicators of radioactive load on humans [44]. Cluster development research in the agro-industrial sector was also conducted by Michenina, G.A. who conducted a comprehensive ecological and economic analysis of the preconditions for entrepreneurship development in the forest resource area and, on the basis of this, developed a mechanism for forming territorial-production of agro-forestry complexes in the form of clusters and substantiated the role of clusters, state and private partnership in the process of forming such clusters [31]. Bystryakova, Yu.I. investigated the peculiarities of development and location of agro-industrial production in radiation-contaminated territories, as well as peculiarities of the harmonization of interests of participants of ecological and economic activity of the respective territories. The results of the analysis became the basis for identifying the nature of the impact of innovations on the development of production, the use of clusters to improve the economic and environmental efficiency of agro-industrial production and develop a model of their functioning [4]. According to the results of Bystryakova Yu.I. the system of provisions of economic and institutional support for the development of regions was developed on the basis of the principles of delimitation of ownership of natural resources and

the harmonization of interests of the participants of ecological and economic activity of the respective territory. It is noteworthy that the author has developed a model of management of territorial ecologically-oriented clusters based on the principles of soft nature management, ecosystem formation, cooperativeness, environmental compliance of the integral resource, mental sufficiency and tolerable risk [4].

Popkova, E.G., Shakhovska, L.S., Abramov, S.A. explored environmental clusters as a tool for enhancing environmental security in developing countries. The authors proposed a method for determining the level of environmental safety and technology for the formation of ecological clusters formed on the basis of biologically active natural complex. According to the results of the performed research, the authors have formed a methodology for implementing a cluster organization of the urban environment [39]. Other scholars, such as Tiberio Daddi & Fabio Iraldo, have addressed the same problem, but its focus has shifted towards evaluating the effectiveness of the cluster approach to improve environmental corporate performance in industrial areas. The researchers analyzed and evaluated an example of an industrial paper cluster located in Italy in the province of Lucca. According to the authors, environmental policy has been developed over the last 10 years in the context of a public-private partnership based on stakeholder engagement in the application of the EU EMAS Regulation. According to the results of the researches, the authors evaluated the effectiveness of the so-called “cluster approach environmental management and audit scheme” (EMAS). These results confirm the effectiveness of public-private partnerships for cluster formation and development [45].

The orientation of economic systems of all structural levels to optimize innovation is a necessary basic basis for the development of entrepreneurship, which requires such institutional support, which would be characterized by harmonized compatibility with international practices and traditions. Today, both in the economic and political life of Ukraine, the tendency to integrate into the international economic space is becoming clearer, and the clearest confirmation of this is the Association Agreement with the European Union. The fundamental foundations for the development of Ukraine’s European integration policy should be the implementation of national and regional-oriented strategic development programmes aimed at adapting domestic industry to EU standards (EN 29000 and EN 45000 series, social security standards, etc.), and providing competitive advantages.

The clustering of innovative initiatives by business entities is an important vector of accelerating integration processes into the European economic space. However, in the process of creation and development of innovation clusters, there are a number of problems, both institutional and economic. Therefore, the problem of finding ways to eliminate barriers to the formation and development of innovative clusters is one of the main strategic priorities for ensuring the competitiveness of business entities.

In many countries, it is known that the cluster structure of business organization is quite effective because it allows to optimize the flow of business processes at the micro-, meso- and macro- levels. In turn, the expansion of the cluster business model is inextricably linked to the systematic reform of the national economy, as it stimulates

transformational changes in its technological complexity, which is a prerequisite for the development of high-tech production.

The development of innovative clusters in Ukraine is an objective necessity caused by the existing national economic and geopolitical relations. However, their creation and development require appropriate work, namely the choice of the industry in which the innovation cluster will be created, the feasibility of its creation, the choice of enterprises to be integrated, and others. The main task is to select the scenario of creating a particular cluster, that is, the system of initial principles on which it will be created and developed.

Analyzing the essential characteristics of each scenarios, it can be argued that in the current economic environment, the most appropriate institutional and organizational scenario is the creation of innovative clusters, since they involve the widest co-operative integration of all elements of industrial and innovation-investment infrastructures.

Generalization of the review of literary sources [32], [50] allowed to identify problems of development of innovative clusters as a form of innovative entrepreneurship that is capable of providing a high level of competitiveness of the products offered on the market: 1. Lack of sufficient regulatory support for the creation and development of innovation clusters in Ukraine stipulates that a business association is a business organization formed within two or more enterprises in order to coordinate their production, scientific and other activities to solve common economic and social problems. There are such organizational legal forms of organization of associations of enterprises as corporations, associations, concerns, consortia and other organizational legal forms. Therefore, the legislation of Ukraine does not explicitly regulate this kind of merging of enterprises as clusters or innovation clusters, indicating the relevant criteria for carrying out their business activities. 2. Incomplete programmatic target base for ensuring the implementation of cluster strategies (mainly focused on individual sectors of the national economy, not on the production of high-tech products. Examples of such state programs are: Concept of the National Targeted Economic Program for Industrial Development for the Period up to 2020 (2013); Concept of the State Target Program for the Development of Land Relations in Ukraine until 2020 (2009); The State Target Program for the Development of the Ukrainian Village for the Period up to 2015 (2007). 3. Lack of proper communication between science, business and government (caused by inefficient public-private partnership in the field of development, testing and implementation of innovative solutions for business entities, which complicates the possibility of adaptation of new technologies at domestic enterprises as self-managing enterprises, and in collaboration with profile institutions: today, there are quite a wide range of institutions activities of which are aimed at facilitating the transfer of innovations, namely: the Regional Centre for Innovation and Patent Information Services; the European Network of Innovation Relay Centres (IRC-network) the Public Ideas Transfer Network for Technology (“TIT Network” or Web TIT, etc.). 4. Insufficient level of development of the institutional environment to support the introduction of innovation and business development; insufficient in-

formation support on the creation and functioning of cluster associations in Ukraine. 5. Unconditional corruption in terms of government guarantees, targeted financing from extrabudgetary funds, government lending and tendering, which leads to the development of money laundering schemes and, as a consequence, incomplete or untimely implementation of state investment and innovation programmes. 6. The lack of investment attractiveness of individual regions causes the absence of investors due to adverse economic, social, political, legal and environmental factors that influence the decisions of potential investors. 7. The lack of interest of small and medium-sized business entities to integrate into large production systems due to the lack of preferences related to venture capital and technological upgrading of fixed assets. 8. Lack of sufficient access of the members of the cluster associations to the credit resources needed to support the implementation of innovative projects. 9. Insufficient number of highly qualified innovation managers – senior and middle management executives of the company, whose primary function is continuous monitoring of the innovation market in order to select, justify the feasibility and further integration of innovative approaches into economic activity at its all functional structures. In turn, such personnel can provide high level of mobility of cluster formations and maximize realization of their advantages.

Accordingly, to overcome these problems in the path of cluster development, it is advisable to analyze the foreign experience of their creation and development. For example, such countries as Denmark, Finland, Austria, Hungary, Poland, Slovenia, Slovakia, Czech Republic, Romania, etc. for the development of clusters, including innovative ones, carried out the following activities [9]: 1. Implementation by governments of complex financial and economic reforms. 2. Involving experts to analyze the prospects for cluster development. 3. Creation of councils, departments, institutes whose activity is aimed at supporting the development of entrepreneurship at all structural levels. 4. Development of concepts of market reforms and clustering of the economy. 5. Creating programmes of financial, legal and technical support for innovative projects implemented by cluster structures.

Countries such as Hungary, Poland, Slovenia, Slovakia and the Czech Republic have engaged Central European Initiative specialists in cluster development and attracted financial support from EU financial institutions, in particular the EBRD [9].

For example, in Hungary, up to 2003, an innovative system was created with more than 150 clusters in the following areas: textile production, construction, optical mechanics, thermal waters, woodworking, automotive, electronics, food and more. There are more than 75 industrial parks in Hungary, bringing together 556 enterprises, employing 60,000 people. Industrial parks in Hungary are endowed with substantial customs and tax benefits. In addition, € 26 billion has been allocated by government programs for the creation of innovation clusters and technology platforms during 2005-2009. € 7 million has been allocated to support small innovative businesses, €50 million for the development of a network of business incubators providing support to small companies in the early stages of their development and € 80 million to strengthen links between industry and universities [15].

There are also good examples of economic clustering in Germany, Italy, Finland, Norway, the Netherlands, Iceland, Japan, the United States, Turkey, Poland, Slovenia, Bulgaria, Kazakhstan, Belarus and more. For example, the economies of Finland and the Netherlands, with 9 and 20 clusters, respectively, are fully clustered. There are 29 clusters in Denmark, with 40% of all businesses in the country accounting for 60% of exports. Cross-border clusters with Italy, Germany, Hungary and Switzerland operate in Austria. Among the most famous clusters concentrated in Europe include the container port of Rotterdam (the Netherlands), the Diamond Center in Antwerp (Belgium), the London Post and Logistics Centre Soho (England), the Engineering Technology Park for the printing industry Heidelberg (Germany), London financial centre City (England) and others. In the USA, there are more than 300 clusters, the origin of which was the development of links between business and academic universities in Silicon Valley [29].

The above facts about the clustering of economic systems of different countries testify to the effectiveness of this model of conducting collective business and a deep interest in their further development from the economically developed countries of the world. In Ukraine, Lviv Region is one of the leaders in the development of cluster structures in Ukraine. In particular, the Lviv cluster of information technologies and business services, the Cluster of woodworking and furniture production, the Rozdillya cluster and others operate here. This is confirmed by the fact that in 2009, the international consulting firm KPMG, Lviv was recognized as one of the most adapted for the development of outsourcing in the field of information technology, the basis for which is the following: 1. Costs lower than those of Kyiv or other cities in Europe are required for new companies to enter the market. 2. Availability of high quality human resources, who are provided by two universities: I. Franko Lviv National University and Lviv Polytechnic National University. 3. Presence of historically formed cultural proximity to Europe. 4. Favourable economic location, including proximity to Europe's leading business centers – Zurich, Berlin and Amsterdam. 5. Availability of developed infrastructure, which has undergone a significant upgrade due to the holding of the Euro-2012 European Football Championship.

Therefore, given the favourable geo-economic location of the Lviv region, it is advisable to develop strategic plans for the development of interstate cluster cooperation in high-tech industries.

In Ukraine, the clustering of business structures is actively developing in the Khmelnytsky region. The initial stages of its development at the regional level testified to the advantages of the network economy model over other regional systems of business organization. In Ukraine, close to cluster associations are organizations that are formed in a number of regions in which the cooperation of different economic entities takes place within a single organizational group. Such organizational associations include PJSC “Novokramatorsk Machine-Building Plant”, concern of PJSC “Stirol” and PJSC “Nord”. Production structures of this type were formed in different ways: on the basis of creation of new economic structures (Obolon PJSC); by consolidation of scientific-production and production associations (Radon concern) and construction of large production and financial systems (Ukrpodshipnik).

In academia and business, there is an opinion that the Biocon group of companies is a high-tech pharmaceutical cluster that integrates a number of companies operating at all levels of the wholesale and retail market segment [49].

If we talk about high-tech clusters, as a result of their activity they carry out systematic introduction of innovative technologies. Today, there are more than 12 high-tech, innovative clusters in Ukraine, namely: “New Machines” (Dnipro); Sustainable Development Energy (Kyiv); New Materials (Kharkiv); Biotechnology (Lviv); Information Society Technologies (Kyiv) and others. (Chupaylenko, O.A. and Bero, V.Yu., 2013). That is, Ukraine has already laid the foundations for the development of cluster associations. However, their development is hampered by a number of institutional, legal and economic obstacles.

Thus, the development of clusters in Ukraine is hampered by a number of prerequisites that need to be addressed through systemic reforms, which should ensure harmonization of domestic and European economic legislation and create mechanisms for establishing interstate cluster cooperation with economically developed countries, in particular the EU countries for optimization of economic integration processes.

The development of innovative clusters should be a key priority in ensuring the competitiveness of domestic producers, as they will allow new products to be repositioned on international commodity markets as well as the country that produces them.

Obviously, for organizing the activity of innovation clusters specializing in the production of innovative, high-tech products, the institutional and organizational scenario is the most optimal, since it combines all the components necessary to organize the production and sale of these products. However, there is no doubt that it is advisable to reconcile the characteristics of institutional, organizational and human development scenarios, since along with the availability of technological basis for the production and marketing of finished products for the full realization of their advantages, it is advisable for these associations to form their own highly qualified personnel, who will be characterized by their ability to innovative management. Such a step will overcome more effectively the problems encountered in the formation and development of innovation clusters, since innovation-driven intelligence is the core of the functioning of this type of association.

Thus, clusters are functioning and developing in Ukraine today, but the lack of adequate legal support and economic incentives hampers their development in Ukraine. Also a decisive problem for their formation in Ukraine is the outdated technological multifaceted nature of the national economic system, which is a major obstacle to the development of industrial clusters in Ukraine.

Research results. The scientific world considers the problem of IC development in managing this process as a phenomenon that occurs when several important factors, the list of which is still debatable, interact. It is worth noting that most of the presented models and theories have already been created by IC, so they are more likely to answer the question of the reasons for their successful development than the question of how they were created. These points of view are a generalization of empirical factor analysis. They are versatile, inconsistent, and reflect individual ICs, but do not characterize them as an economic phenomenon in general.

It is almost impossible to apply the above mentioned models in implementing various government and private initiatives, since all these models reflect the main features of the interaction of already the formed system of economic relations inside IC and outside. None of them demonstrates the origin of IC and does not reveal the features of this process. Therefore, designing artificial ICs by copying the “interaction” theoretically described in the models presented above, is nothing more than a “fake” of specific ICs in a certain territory. It seems more likely that the government can create economic zones promoting the high business activity, and then forming ICs will be possible if there are appropriate historical and cultural characteristics, a high level of the local population entrepreneurial activity, and the necessary resources’ availability [51]. Artificial forming ICs is a complex, individually creative process that cannot be fully based on one of the existing theories. Therefore, the government initiatives should be aimed at supporting the development of already existing ICs rather than forming them.

Based on the lack of a sufficiently detailed interpretation of the sources of IC competitiveness, it is advisable to present own understanding of what factors play a decisive role in forming ICs, which of them contribute to forming a certain specialization business and increasing its concentration on a certain geographical location. Based on an empirical analysis of the textile cluster emergence in Italy, Silicon valley in the United States, and IT clusters in some cities in Central-Eastern Europe and South Asia, we can say that the origin of ICs is not a random process that depends entirely on historical, cultural, and political circumstances, since some of the ICs were originated in a not too “friendly” economic and political environment. Most of them were formed due to the development of the latest technologies and unique traditions of a particular region, which explains their location and success, moreover, it also explains the high level of enterprises specialization in ICs.

The local population entrepreneurial activity plays a significant role, since it determines whether the residents of a particular region are able to convert the advantages of their region into wealth. The most important element of small and medium-sized businesses are business founders who believe in the success of their own business, have a significant experience in manufacturing this or that product and have the appropriate skills to sell it. A high proportion of people with these skills is one of the significant competitive advantages of ICs, as it demonstrates whether IC can grow by attracting investment and opening new businesses that will bring new experience, technologies and customers to IC.

In addition to these factors, the state authorities’ assistance is also important. The significance of this factor is not decisive, since even in the absence of economic advantages for the enterprises of a certain IC type, its successful economic development is still possible. Analysis of some ICs formation and development experience proves that the indifferent attitude of state regulators usually even more favorably affects the economic state of ICs than the interference in its functioning. However, in conditions of political and economic instability, the economic IC may lose market positions, as the best specialists leave their companies in search for more stable

working conditions, companies change their location, and so on. In conditions of acute regulating, the origin of ICs is complicated and the one which will not be characterized by significant competitive advantages in the long term. However, the above done analysis proves that the state regulators' assistance is not decisive in the ICs success, since in the history of economic relations, the formation of globally successful ICs from small and medium-sized businesses is possible only if there are appropriate features of a particular region. The exception is direct investments of the international multinational giants in a certain region with cheap resources. Despite this, such ICs mainly consist of large enterprises that do not contact each other in any way, and therefore, it is unlikely that such economic entities can be called full-fledged ICs. Benefits from their formation are usually received by a small group of people, large investors having sufficient resources to lobby their own interests in public authorities, which creates deficit zones on the territory of a certain country, deepens inequality and leads to the depreciation of the labor force.

Infrastructure also has an important influence on the formation of ICs. Its presence simplifies the business environment and contributes to the entrepreneurial activity growth. Therefore, the access to high-speed Internet, high-quality roads and other factors simplifies the running of small and medium-sized businesses, contributes to its birth and development. An IC with a developed infrastructure is significantly more competitive than a similar IC without it.

It is also worth mentioning that the development of ICs usually takes place in a territory that is characterized by favorable climatic and natural conditions. The example can be a technological IC in Silicon valley located in California (USA), a textile IC in Italy (areas of Bologna and Milan), and many others. Many companies and freelancers working in the field of high technology are moving their own business to Thailand. The communication with the companies' employees of the Lviv IT-cluster shows that some companies from Lviv are planning to move to the "hot lands" (for example, the Ukrainian company "PIPL", the manufacturer of the world-famous Ajax alarm system, have moved some of their offices from Kiev to California (USA)), most of them work in the field of crypto currency. The emergence of some tourist ICs is often based on appropriate natural conditions, which contributes to the ICs promotion and business development on its territory. It is interesting that most economic theories are based on scientific empirical observations, whose authors are business representatives, thus, many factors, whose impact can not be directly analyzed, are often omitted. Therefore, the fact that weather in New York influences on the dynamics of prices on international speculative markets can be considered comical, but this influence exists, although it is not significant, since the person psychological dependence on the weather is scientifically proven. The high psychological state contributes to the risk growth, the depressed state reduces the person activity, makes it less risky, which affects the investors' decisions, and therefore, affects short-term price fluctuations. The exceptional development of philosophy and science in Ancient Greece was not accidental. One of the reasons was the favorable natural and climatic conditions that allowed the ancient Greeks to focus on their own

intellectual development. Human behavior is subject to nature laws, and therefore, it depends on its natural environment, which should be taken into account when conducting scientific research on the IC exceptional success in a particular region. All the identified factors should be divided into factors of direct and indirect influence. This allows explaining the interaction between them and their role in the IC formation. In addition, this allows dividing the tools for regulating the IC development by weight. This approach is especially valuable when analyzing the IC competitiveness, since it indicates the directions of scientific research, allows focusing on certain factors, and forms a theoretical basis for further scientific research. All the selected factors should not be considered as a system of a single whole, the presence of some can also serve as a sufficient reason for the IC formation and its successful economic development, but if there are similar IC competitors, the advantage is of the one who has a full set of these factors. This approach assumes that the IC formation occurs gradually, and not under the condition of artificial mass concentration of a certain type enterprises on a certain geographical location, which is characterized by cheap resources. Among the process stages of the IC formation and development, first of all, it is necessary to distinguish the growth stage of the small and medium-sized businesses concentration in a certain territory, provided that there are cultural, educational and scientific opportunities for a certain specialization. This contributes to the accumulation of unique experience, knowledge and skills and deepens interaction with educational and scientific institutions, promotes communication inside IC, and forms the basis for the emergence of large companies having sufficient competitive advantages to further enter international markets.

At the stage of increasing the small and medium-sized businesses concentration in a certain territory, the IC is already becoming a strong player in the international arena, there is an abnormal increase in wages for a geographical location, there is a specialization deepening, and business activity increasing. IC begins to attract resources, labor, and technologies, whose cost begins to grow inside IC. Each of the stages of the IC development is the basis for further acceleration of exponential growth. With the transition from one stage to another, the level of competitiveness increases, the weight in the international arena increases, and the market positions of its participants increase. The process of the IC development and formation is a natural exponential process, which organically reflects the nature and society laws in the economy and is the next milestone in the competitiveness growth of its individual players, who gain competitive advantages from interaction with medium and small businesses. IC acquires the features of a revolutionary new link in the structure of global competitiveness enhancement, technology development, narrow specialized products improvement, obtaining new experience and supplying high-quality personnel for the further industry development and its entry to a new level of improving its own competitiveness. It is important that the exponentially growing processes in the economy are characterized by a high risk of “bubbles” and financial crashes, however, most ICs compete not by increasing the value of their own assets, but by creating a qualitatively new competitive product that the company cannot generate

individually. One feature of the given list of the IC competitiveness sources is the allocation of some factors' significant influence on the stages of its formation and development. These factors include cultural and historical circumstances, as well as education and science. Thus, the inheritance of the developed technical school of the Soviet Union contributed to the IC development in Ukraine, Russia, and Azerbaijan. Cultural and historical circumstances contributed to the textile industry development in Italy. Therefore, it should be noted that the presence of certain cultural and educational features contributes to deepening specialization of enterprises in a particular region. This proves that the presence of these factors is necessary for the IC origin, because if there is no narrow specialization, territories with a high concentration of small and medium-sized businesses can be considered exclusively as an economically developed region, but not as an IC. In this case, it is important to distinguish the IR concept in astronomy and in economics.

Conclusions

From the standpoint of the concept of sustainable development, research papers on cluster research can be roughly divided into two groups – those that try to explain the nature of the phenomenon of clustering in the economy, and those that focus on the process of cluster development. This separation is conditional because, in the first and second groups, there are factors that have a decisive influence on the clusters. An analysis of these factors is the way to identify the fundamental essential features of clusters. One of them, which is undeniable, is the geographical location of the entrepreneurial activity of the entities that are independent economic entities. Other signs today are debatable. This is due to the phenomenality of the emergence and development of each of the clusters. In the research papers analyzed above, virtually all researchers point out that the emergence and prosperity of clusters occur when favourable conditions arise and the values of sustainable development are professed. The concept of “favourable conditions” for scientists is interpreted in different ways, as the totality of all together or individually taken conditions such as: the natural features of the region, the peculiarities of historical circumstances and traditions, exclusive government policy, etc. It should be noted that more and more scholars are emphasizing that favourable conditions for the emergence and development of clusters can and should form governments, but not all of these scholars have an adequate vision of the common and distinct characteristics between clusters and other forms of innovative entrepreneurship.

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