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Development and Functioning of Clusters in Poland[1]

Introduction

With the progress of globalization, maintaining the international competitiveness of the economy is an increasingly difficult challenge. It requires a significant modification of economic policy and business strategies. A new way of creating a competitiveness of enterprises is the concept of clusters. They are an effective way to seek synergies effects arising from cooperation between different entities in the so-called triple helix, so business, academic institutions and public authorities [11]. Clusters are an expression of a new way of thinking about economic processes, their organization and efficiency. They aim to facilitate the flow of information and create innovative channels of communication which is essential for the spread of innovation and knowledge [6].

General characteristics of clusters

An American economist, Michael Porter, is considered as the founder of the idea of clustering. His research has initiated a time of rapid development of the theory of clusters and the attempt at an empirical verification of this concept. In 1990, Porter published "The Competitive Advantage of Nations" in which the theory of national and local competitiveness in the global economy context was formulated. Porter found that a key role in the development of individual businesses and also their surroundings, so entire regions, play networks – specific economic linkages between the various participants functioning on the market.

Porter [18] presented the current paradigm shift functioning in the global economy, the transition from rivalry and competition for extensive collaboration and cooperation. He defines clusters as geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities.

Cluster and cluster initiative

It is important to distinguish the cluster and also the so-called cluster initiative. Cluster initiatives are actions taken by many groups of entities in order to create or improve the strength of the cluster. It can be stated that cluster initiatives are consciously undertaken efforts to improve competitiveness by engaging the cooperation of companies, local government and universities and R&D institutions in the field associated with the generation of specific products or services [16]. Starting the cluster initiative may be the result of the bottom-up activities taken by economic entities interested in collaboration or may be the result of the top-down actions taken by public authorities [12]. In addition to Porter's theory, many other definitions of cluster can be found in the literature. Rosenfeld [19] defines clusters as a geographically bounded concentration of similar, related or complementary businesses, with active channels for business transactions, communications and dialogue that share specialized infrastructure, labor markets and services and that are faced with common opportunities and threats. The geographical distinction provided also Cook [3] stressing out that clusters are geographically proximate firms in vertical and horizontal relationships, involving a localized enterprise support infrastructure with shared developmental vision for business growth, based on competition and cooperation in a specific market field. Doeringer and Terkla [4] argues however that the geographic concentrations of industries effects in gaining performance advantages through co-location. Another definition of the cluster is given also by the Polish Ministry of

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Economy, by defining cluster as spatial and sectorial concentration of organizations dedicated to economic development or innovations, and at least 10 enterprises engaged in economic activity in one or more neighboring regions competing and cooperating in the same or related sectors, and linked by the extensive network, with at least half of the entities within the cluster being the entrepreneurs. According to this definition, clusters are the most important centers of knowledge, technological innovation and new management standards, all of which affect every segment of market.

Typology of clusters

Clustering is a complex, dynamic and multidimensional phenomenon. Each cluster has a unique and specific nature. In the literature, attempts at the classification of clusters are made according to various criteria [5]:

- The development phase – embryonic, mature and declining clusters.
- The ability to create jobs – clusters of increasing, stable or decreasing employment.
- Territorial scope – local, regional, national, transnational clusters.
- The number of horizontally related sectors – narrow or broad clusters.
- The number of stages in the production chain – deep and shallow clusters.
- Competitive position – clusters that are leaders in national or global level, or having an average or weak competitive position.
- The importance of technology/innovation – high, medium or low technology clusters.

Another classification provided J. Mayer-Stamer [9], who identified three types of clusters due to the size and ownership structure of participating entities:

- Clusters related to the Italian industrial districts – characterized by the dominance of small and medium enterprises, strong specialization and a networking system based on trust.
- Hub-and-spoke clusters – dominated by one or several large firms surrounded by smaller suppliers and related activities
- Satellite clusters – dominated by the branch facilities of externally – based multi – plant firms.

Characteristics of clusters

Clusters are varied and created through various mechanisms. The key to understanding the essence of the cluster is to take into account the role and interactions between the following factors [10]:

- Spatial concentration,
- Geographical proximity,
- Systemic nature of the network linkages,
- Coopetition, so simultaneously process of competitiveness and co-operation,
- A long tradition of the specific activity at a given location,
- Attractive market for specialized labor,
- Effective diffusion of the so-called tacit knowledge, whose acquisition requires entering into direct relations,
- Social capital resources exemplified by mutual trust, identification of common goals and effective cooperation in the triple helix system.

Phases of cluster development

Porter [18] suggests that clusters can be identified through a four stage process that begins with the identification of a concentration of big companies, and then searches for linkages to other enterprises that feed its activities. The second step is to locate horizontal industries or companies that produce complementary products or services, which usually make use of specialized inputs or technologies or share common supply linkages. The third step contains locating the major organizations that provide network of companies with specialized skills, technology, information, capital or infrastructure. The final step is related to the governmental role and other economic development agencies that support the activities of the cluster.

Porter’s analysis of the main components that comprise a cluster recognizes the importance of “untraded interdependencies” among companies and supporting organizations which arise from the co-

-location of specific inputs to the innovation process, such as R&D facilities, training institutions, specialized service providers and suppliers of main elements.

Methodology of clusters measuring

In peer studies published so far different approaches adapted to both the level of aggregation studies, as well as to the available statistical and qualitative data were used. However three basic methods exist: the Input/Output method, high points method and a method based on the analysis of case studies. The I/O method allows for identifying clusters and their range in the most objective way. However, its major disadvantage is the lack of availability of statistical data in some countries or regions. The high points method provides an easy and fast way to identify the presence of concentrations in certain sectors – however it only provides the basis for further analysis, because it says nothing about the structure and functioning of the cluster potential. The method which provides the most complete knowledge of the clusters structure, their formation and functioning is the qualitative analysis based on interviews and case studies. The main problem in applying this method is the subjectivity of the evaluation of qualitative data and the difficulty of comparability of results [2].

Cluster-based policy in Poland

The global tendency is taking an action to support the development of clusters. In many countries the so-called cluster-based policy is used. These structures are seen as a form of organization of business processes with a high potential for innovation, and thus as a form conducive to growth of the competitiveness level. Changes that occur in the global economy seem to confirm these assumptions, and the position of clusters as growth factors and sources of competitive advantage is increasing. This results from the fact that these structures are microsystems, both in economic and social terms. They allow businesses and entire regions to find specialized niches and consequently to attract investors interested in investing resources where conditions for the industry are the most attractive. In other words, clusters stimulate the growth of the industry in which they operate, and simultaneously they lead to the specialization of the region [17]. Construction of clusters in Poland allows to identify the strengths of the region, makes it easier to obtain funds for their development, and also stimulates local activity and entrepreneurship.

Advantages of clusters

The research done by The Cluster Development Programme [16], has shown that participants of clusters, see the following benefits:

- New networks or contacts,
- Improvement of own business profile in the market,
- Access to skills, knowledge and/or resources of other members of the cluster,
- Improvement of ability to compete abroad,
- Improvement in case of access to: specialized infrastructure, skilled labor, specialized training.

Given the extensive experience of developed countries, the most significant seems to be the impact of clusters on the growth of competitiveness of the participating entities. Porter provides a compelling analysis of the way in which the existence of clusters affects competition. The first is by increasing the productivity of their constituent firms and industries. The second important effect of clusters is on improving the capacity of the member firms to innovate and thus enhancing their potential for productivity growth. The third key benefit of clusters arises from the formation of new firms, further contributing to innovation and expanding the size and significance of the cluster itself. The benefits in efficiency and innovation to a large extent are the result of co-occurrence of competition and cooperation in clusters. They can coexist, because they exist in various fields and between different actors and the cooperation in specific areas conducive to effective competition in others.

Cluster-support policy in Poland

Numerous benefits of clustering for individual participants and regions mean that clusters are engines of economic growth. For this reason, clusters have become the object of particular interest for public authorities at various levels.

Prior to 2007, cluster policy in Poland was carried out by Sectoral Operational Programme “Improvement of the Competitiveness of Enterprises 2004-2006” and “Operational Programme Human Capital 2004-2006”. In the current programming period 2007-2013, the cluster support programs were included in both the nationwide operational programs and regional operational programs of individual provinces. Currently at the national level, the “Operational Programme Innovative Economy 2007-2013” and “Operational Programme Human Capital” are important. Clustering is also supported under the “Operational Programme of Eastern Poland”, which cover five provinces.

In case of support for the regional clusters, located basically on the territory of one province, the Regional Operational Programs are dedicated. Due to the fact that clusters are a regional phenomenon, the main supporting actors are government entities. Analyzing the contents of these regional programs for 2007-2013, the greatest possible support is dedicated to projects related to the initiating the cooperative relations, focusing on: the creation of clusters, their joint marketing activities, efforts to attract new participants, promoting best practices, and creating co-operation between members of cluster in order to transfer of technology [13].

Examples of clusters in Poland

Clusters in the Polish economic realities are already present in all sectors and industries. They are characterized by different level of innovation and technological advancement, represent the entire spectrum of organizational models and they have different financial backgrounds. However, in common is the fact that they are in the avant-garde of the changes taking place in the current Polish economy. According to various estimates, Poland has 100 to even over 150 clusters, with around 600 of cluster initiatives [7].

Given the role of clusters as a catalyst for innovation processes in regions, they arise primarily in high tech sectors. The examples are: Aviation Valley in Podkarpackie province, Cluster of Multimedia and Information Systems in Nowy Sacz in Poland, or the most common IT clusters, including Małopolska IT Cluster in Malopolskie province, ICT Cluster in Mazovia and ICT Pomerania Cluster. It should be noted that clusters are formed not only in high tech sectors, but also in traditional sectors, such as Wielkopolska Furniture Cluster, Innovative Pleszewski Boiler, Silesian Regional Clean Coal Technology Cluster, Organic Food Valley in Lublin or the recently developed Cluster of Innovation in Agribusiness in Mazovia region [14].

The example of “Cluster of Innovation in Agribusiness” in Mazovia region

In the Masovia Province more and more companies understands the need of cooperation and more significant integration between them to be competitive in the global changeable market. The “Cluster of Innovation in Agribusiness” has been welcomed recently in Mazovia region. This initiative is certainly interesting and highly innovative, which can bring many benefits, not only to participating units, but also the region where they will intensify their activities. “Cluster of Innovation in Agribusiness”, established by the Warsaw University of Life Sciences – SGGW has been created as a part of the Regional Operational Programme of Mazovia Province 2007-2013 (Priority I – Creating conditions for development of innovation potential and entrepreneurship in Mazovia, Measure 1.6. Promoting cooperative relations of regional significance). The main focus of the cluster is to transfer the knowledge into business (science to business-S2B), increase the efficiency of technology and knowledge transfer between participants in the cluster, and consequently increase the innovative potential of the Mazovia region. The subject of this project is to create corporate relations for regional functioning within the broader field of Agribusiness. Initiation of cooperation within the cluster aims to create an effective tool for policy development, raising levels of innovation and competitiveness of enterprises in Mazovia. Analyzing the project will unite universities as the research facility of the project, business institutions and companies.

As a result of the project, the internet platform for Innovation in Agribusiness will be created, in order to provide information, establish cooperation linkages and implement joint innovative initiatives.

Creation of the integrated online platform will allow the offering of five innovative tools in two modules: Food Safety and Food Professional. The first module will include: Supply chain management platform and Quality management platform. The second module will provide: E-learning platform, Platform to connect the investors and innovators and A platform for creating the work groups within the cluster undertaking specific actions.

Such services are not offered currently by any cooperative agreement in the region, nor in Poland. Therefore the created set of services should be called product innovation on a regional or even national scale, while the architecture of IT solutions developed in the project will be known as a process innovation.

Internationalization of clusters – international network development

An important element of cluster policy is to promote the internationalization of clusters. They lead to the mutual exchange of experiences, strengthening technology transfer and the flow of knowledge and information between industry and research centers located in different countries and regions. The internationalization of clusters is now of increasing importance. It is related to the processes of globalization of the world economy and European integration and improved conditions of the flow of resources across national borders. Opening the new markets meant that cluster initiatives should also be open to foreign partners, and thus international collaboration.

Clusters in Poland are no longer a novelty, but in terms of experience in building networks and building links between the business, science and administration sector, Poland is farther than other countries. In Europe, the United States and also in Asia clusters have been discovered decades ago and now have a vast knowledge backed by extensive experience and thus this experience should be used [8]. An example of the Polish activities in this area is active participation in the PRO INNO European Cluster Alliance [15], which is a network of international projects linking clusters, such as:

- BSR InnoNET (Baltic Sea Region Innovation Network), which brings together representatives of the Ministry of Economy and the Institute for Market Economics,
- INNET, including the Polish Agency for Enterprise Development and the Office of Marshal of Mazovia,
- CEE-ClusterNetwork, where Poland is represented by the Industrial Development Agency.

Another example of activities driving the internationalization of clusters are projects such as “Region of Knowledge-RoK”, as a component of the Seventh Framework Programme for Research and Technological Development of the EU. Projects of “Regions of Knowledge” were first introduced by the European Parliament as a pilot operation in 2003. The main objective of intervention was to stimulate the integration of European regions and promoting cooperation between universities and also to realize a huge role of knowledge in the regional development. Emphasis was also laid on increasing the transnational and interregional cooperation, which would allow the transfer of knowledge relating to policy research between regions. Over time the experience between supported projects through the cooperation on the European scale has become increasingly important exchange. Currently the project "Regions of Knowledge" carried out within international cooperation exists in the ten thematic areas corresponding to major fields of knowledge and technology, where it is necessary to support and strengthen the highest quality research. One of the key topics is food, as a potential area of cluster cooperation [20].

The project “Regions of Knowledge for Food” aims to support and encourage regional clusters in the food sector to collaborate with European universities, research centers, enterprises and regional authorities. “Cluster of Innovation in Agribusiness”, seeking to strengthen the research potential in the food sector in Mazovia are perfectly consistent with the strategy of the project “Regions of Knowledge for Food”. Finally the cluster participation in the project will strengthen the competitive position of Mazovia province in the European market.

Taking into account the perspectives of the “Regions of Knowledge” project, it is clear that the potential for innovation lies precisely in the regions, and to liberate it, the financial support measures should be directed right there. The 7th Framework Programme in a number of initiatives provides these possibilities, and one of them are just projects such as “Regions of Knowledge”, which according to the concept of “learning and working together”, are part of a strategy for Europe 2020 [20].

Polish institutions, including the Warsaw University of Life Sciences have a great opportunity to become actively involved in cooperation with the best and create the European Research Area. Polish regions, including Mazovia taking part in the RoK projects, have a chance to create and agreement platform for researchers, industry, government, and better use of Structural Funds. The objective seems to be very ambitious, but certainly possible to obtain.

Conclusions

Clusters are seen as new economic structures that affect the development of its subjects and the development of the region where the cluster participants interact. The functioning of clusters stimulates entrepreneurship, leading to the dynamic creation of new businesses, as well as the impact on innovation and competitiveness of the companies that formed the cluster [1]. Experiences show that companies operating in clusters, with a network of mutual relations and close cooperation with institutions from science, education or administration, become more competitive and achieve greater success. Cluster development not only influences the development of companies, but also entire regions where they are located. They allow better use of internal potentials for regional development and attract external investment.

The European funds by definition are an incentive for the creation and development of clusters, and in the next stage for their independence. But it should be kept in mind that this is only a form of temporary assistance. The real key to success is an effective collaboration, effective communication and the ability of strategic thinking. By doing so the cluster has a chance to develop and improve its competitiveness. Currently it is difficult to predict what the future cluster in Poland will be. It is hoped that through the transfer of good practices and knowledge they will become a standard.

Rozwój i funkcjonowanie Klastrów w Polsce

Streszczenie

Celem artykułu jest przybliżenie zagadnień dotyczących istoty klastrów, korzyści funkcjonowania w klastrze oraz kształtowania polityki klastrowej w Polsce. Klastry są synonimem sukcesu zbudowanego na wysokiej jakości konkurencji. Tak rozumiana perspektywa zbliża do siebie świat nauki, przedsiębiorców oraz środowiska samorządów lokalnych, mobilizując do działania w kierunku tworzenia klastrów. To zagadnienie zostało omówione na przykładzie nowo powstałego „Klastra Innowacji w Agrobiznesie” na terenie Mazowsza.

Abstract

The aim of this paper is to present issues concerning the concept of clusters, advantages of the cluster functioning and cluster policy in Poland. Clusters are synonymous with success built on a high-quality competition. Such an understanding of perspective brings together the world of science, business and the local environment, mobilizing action towards the formation of clusters. This issue was discussed on the example of the newly established "Cluster of Innovation in Agribusiness" in Mazovia region.

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