SCIENTIFIC REVIEW

Innovation Policy Based on Network Paradigm

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ABSTARCT *– The aim of this paper is to present the role of cluster and network collaboration in innovativeness process and knowledge based economy. The paper describes the clustering pagadigm in EU policy and examples of the network creating process and organizing cluster initiatives in EU countries.*

According to the results of literary research it is possible to univocally state that the geographical proximity between enterprises of a similar profile of activity facilitates the achievement of a higher level of productivity and innovativeness. The clusters covering the spatial sphere of its location: producers, suppliers, service providers, research units, educational institutions and other units supporting a given sector became an important factor in the economic development of regions. The trend towards interaction and basing on the resources of business partners operating in a given location results from the new trends of management, among others, the school of resources in strategic management at the top with key competences and the *open innovation paradigm*.

Directing the regional policies of the EU along the concept of clusters also results from the wide impact of the progressing globalization on the essence of inter-regional competitiveness as well as regional cohesion (Matlovič R., Matlovičová K. 2008). Increasingly lower costs of transport and communication and the simultaneous liberalization of international trade revealed the weaknesses of regional economies and exposed them to global competition. With regard to the increasing number of locations with attractive conditions for investment, European regions faced the necessity of offering foreign investors even more unique benefits. Clusters became in this situation a magnet attracting a bunch of highly specialized resources of knowledge in a given sector which are not present in other locations.

Therefore, due to its practical application, the concept of the theoretical clusters regardless of whether the work of *M. Porter* or as a stage in the evolution of industrial districts of *Marshall* in the direction of the systems of innovation became one of the most important elements of economic, innovative and regional policies of the EU. The reasons for such a turnaround in the activities of the European Commission have been previously indicated. It is possible to add that the traditional instruments of supporting economic growth and the competitiveness of regions, for instance by supporting whole branches of the industrial sector, have not succeeded and had to be replaced by a mechanism that is more adjusted to the challenges of the global economy.

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The network approach to innovation and the according theory of clusters became the central point of interest for the EU. A key element in the policies of innovation of the EU became the *cluster-based policy*. This type of policy is defined as a grouping of activities and instruments used by the authorities at various levels for the improvement of the level of competitiveness of the economy by stimulating the development of the existing cluster systems or their creation at first and foremost the regional level (Brodnicki, Szultka, 2004). Among the elements that decide on the effectiveness of policies of supporting clusters the following assumptions can be listed (EDA, 1997):

- The driving strength of the cluster policy is the free market;
- This combines various units of the regional economy;
- This is based on cooperation and mutual activity;
- This takes the form of a strategic nature and helps to shape a common vision;
- This creates new value.

Involvement in initiating policies based on clusters can be naturally explained by the determination of EU member countries in the realization of the aims of the Lisbon Strategy whose achievement at the first deadline turned out to be impossible. Clusters seem to be the appropriate direction for the realization of the innovative policies of the EU. From the point of view of the European Commission, promoting policies based on clusters is to lead to the achievement of the aims of the Lisbon Strategy. The competing conglomeration of enterprises provides the possibility of access to the network filled with skills and abilities to generate innovation. They are becoming an effective environment in which it is easier to realize the initiation of new products immediately after their development in research laboratories.

A policy based on clusters is not a separate element of activities on the part of national and regional authorities, but should be rather treated as an integral element of various policies. This is most frequently reflected in the assumptions of scientific policy or scientific and technological, innovative, economic, and regional development. In this way the idea of clusters penetrates into the strategy of development for regions, but is also taken into account in state programmes that are financed by the EU structural funds. Most often however, the philosophy of policies based on clusters takes on a horizontal nature and finds itself in all the afore-mentioned policies. It fits in perfectly into the policies of regional development based on the model of the innovation system. Clusters as a way of arousing the innovativeness of regions usually find themselves among the priorities of regional strategies of innovation. The cluster policy is part of the model of strengthening interactions within the framework of the so-called *triple helix*, or in other words, the system of interactions between the key players of the system of innovation: enteprises, scientific and research units and local authorities.

The concept of clusters became a topic of interest for national and regional governments, organizations of entrepreneurs, international organizations particularly OECD countries and the EU in the second half of the 1990s. This interest can be observed through successive *cluster initiatives*, starting from the theoretical work explaining the essence of clusters to the attempts of working out the methodology of their identification and finally the guiding rules in the sphere of the policies of stimulating clusters in regions. These last initiatives are worth

devoting more time to in order to illustrate the factors of success in undertaking activities within the framework of regional policies on behalf of the development of clusters, which has been done in the later stages of this paper. The guiding rules of the programme and the strategic documents of the EU took account of the concept of clusters relatively late as it occurred at the beginning of this century but it is necessary to explain this as a rather different approach to the issue of the innovativeness of regions. The efforts in this area were from the very beginning directed towards the issue of the systems of innovation, industrial districts and local innovative environments, which in their own essence are also based on the network paradigm of innovativeness.

Apart from the initiation of the afore-mentioned models of regional development, another trend of activity in the EU associated with clusters was the creation of networks of interaction between regions. The stimulation of networks of interaction appears in various aspects and policies of the EU. The scientific and research policies can be used here as an example together with its main instrument in the form of the Framework Programmes that support the networks of interaction of scientific centres and their relations with industry. In the middle of the 1990s, the EU started to place particular emphasis on the issue of regional innovativeness. The breakthrough moment was the passing of the Lisbon Declaration by the European Council in 2000 and the acceptance of the aim of transforming the EU economy in the most competitive market based on knowledge in the world. In this context the policy of supporting clusters in EU member countries grew in importance and the regional authorities acknowledged that the foundation of competitiveness is that of small enterprises. The creation of an environment that is friendly towards the development of small firms became a priority, particularly through the stimulation of interaction between them and also creating interaction with the R&D sector. The strategy of development for EU member countries initiated with the aid of programmes financed by EU funds that were assigned priorities in the sphere of supporting networks of interaction at the level of enterprises and the area of R&D. The network model of innovativeness was accepted as binding, in which the theory of clusters fits perfectly.

The activity of the EU Commission in the area of creating a favourable regulatory framework and the popularization of knowledge on the topic of clusters is confirmed by many conceptual papers and documents among which the following can be mentioned:

- "Industrial Policy in an Enlarged Europe" from 2002, in which the creation of innovative clusters became acknowledged as the key priority of the new industrial policy,
- Communiqué entitled "Some Key Issues in Europe's Competitiveness – Towards an Integrated Approach", according to which one of the proposed activities was to be the European project of identifying the best practices in the sphere of of initiatives of developing clusters,
- Programme document entitled "Industrial Policy in an Enlarged Europe" from 2004, in which the innovative policies and supporting initiatives based on clusters were listed as being of key importance (Ślusarczyk B., 2008),
- Consultation document entitled "Innovate for a competitive Europe", which states that the structural funds can support the internationalization of regional

clusters, which according to the European Commission became the effective mechanism of stimulating innovation.

The policy of regional development based on clusters can be the effect of bottom-up initiatives, as well as resulting from top-down initiatives. The second type of operation is the effect of the activity of the local authorities, however the bottom-up activity is usually characterized by the activity of the branch environment. Regardless of the way of realization of the cluster initiatives, a significant role should be attributed to the public authorities. According to M. Porter, the role of the public factor in creating and stimulating the development of the cluster in the area of shaping the factors of production, related and supporting sectors, conditions of demand, as well as the strategy and rivalry between enterprises (Porter M. 2001).

The first paper that carried out a complex analysis on the effects of policies based on clusters realized in selected countries is the document entitled "*The Cluster Initiative Greenbook*". In this document the results of research into cluster initiatives were presented within the dimension of their effectiveness and range. Interesting results were also presented within the framework of a range of OECD projects (OECD 2001) directed at the analysis of practical aspects of the functioning of clusters. The afore-mentioned projects were aimed at diagnosing the existing state in the area of cluster initiatives, as well as working out the guiding principles in the area of formulating and initiating innovative policies based on networks. A compendium of knowledge and a type of guidebook on the topic of shaping policies based on clusters is constituted by the work prepared by the non-governmental organization IKED (*International Organization for Knowledge Economy and Enterprise Development*) (Anderson 2004). In the identification of the recommendations and factors of success in the realization of cluster initiatives the report prepared at the request of the Ministry of Trade and Industry of Great Britain was also used (*A Practical Guide...)* .

On the basis of the afore-mentioned documents it is possible to indicate the experience of particular countries in the area of initiating policies based on clusters. The results of research facilitate the creation of the basic recommendations for the practical formulation and initiation of the policies of regional development based on the concept of clusters.

Cluster initiatives most frequently appear in highly developed countries, mainly in the sectors of large technological intensities with regard to the following: IT, telecommunications, medical equipment, production technology, pharmaceuticals, automotive. Most initiatives were directed at the development of a specific cluster and were started between the years 1999 – 2002. The aims of creating cluster initiatives are very varied and can be classified within the framework of the following 6 categories: research and the creation of network interactions, education and training, innovation and technology, expansion of cluster, political activity, commercial interaction. Within the framework of the distinguished categories of aims, most participants of clusters (over 75%) indicate the main aims of their participation in cluster initiatives as follows: the creation of interaction between enterprises and creating relations between people, development of their own company, easier access to new technologies and the ability to create innovation. Initiatives that have a priority goal in promoting innovation and new technology achieve significantly greater success in the area of improving the competitiveness of particular enterprises.

The process of creating and organizing cluster initiatives takes on different forms despite the fact that the nature of such initiatives enforces the principles of creating a partnership between the industrial sector, research and public authorities. The participation of particular parties is varied in individual cases. The idea of constructing a cluster is most frequently becoming an initiative of local authorities and the sector of enterprises at a more or less equal pace. A decidedly greater role in the aspect of financing cluster projects is played by public authorities. In over half of the clusters analysed, the main source of financing was the regional budget or national public units. In turn, the involvement of colleges in initiating clusters in their initial phase of development was very small, which clearly confirms the low financing coming from these units. A dominating role in managing clusters is played by the sector of enterprises, while the role of public authorities in some decisions is also envisaged. The involvement of local authorities, most often in the form of neutral organizational units, is to lead to the balancing of interests of the competing enterprises. The source of financing does not seem to have great significance in achieving results both in the aspect of competitiveness as well as the numbers of members of a cluster.

According to the theory of clustering, most initiatives are directed in their own sphere in a given industrial branch or geographical zone. Most existing clusters include units that are located within a radius of one hour's drive. The aspect of geographical distances was indicated as a significant factor in facilitating mutual personal contact. Clusters are not limited to the type of enterprises which can become its member. Both direct competitors and foreign business units can freely participate in the aforesaid initiatives. The only restriction in this regard refers to one level in the value chain, which means for instance a greater role in including specific producers but not their suppliers and clients.

The fundamentality of initiating policies based on clusters is becoming univocally confirmed by the benefits indicated which are provided to enterprises in these types of initiatives. Entrepreneurs identify the success resulting from the membership of a cluster through the prism of competitiveness and achievement of business goals. Most entrepreneurs confirm that the initiatives led to the improvement of their competitiveness and the most frequent effect is the tightening of interaction between the industrial sector and the R&D area. The factors that are decisive in the success of clusters include the following: the quality of the business environment, structure and way of running economic policies, as well as the internal strength of the cluster itself. Within the framework of the first category two key factors should be listed which attract other firms to participate in the cluster initiative to the highest degree: the presence of an advanced scientific society and a high level of trust between firms, while also the public and private sectors. Economic policy is also significant with such elements as: promotion of scientific research and innovation, the possibility of taking economic decisions at a regional level, protection of the high level of market competition. The trend of achieving better results in the area of competitiveness is visible through cluster initiatives directed at strong clusters. Clusters with a significant economic meaning on the scale of the whole region or country and a longer history of existence are more attractive for new members. They usually attract the presence of enterprises that compete on an international scale.

Within the framework of research presented in the *Green Book* a range of factors was diagnosed that are decisive to the failure of cluster initiatives. The greatest significance is

attributed to the lack of consensus in the area of taking action, as well as a clearly formulated vision for the initiatives and undefined aims of a quantifiable nature. Significant meaning in the failure of initiatives is played by the issue of insufficient resources, both in infrastructure and financing. Other elements that lead to unsatisfactory results are as follows: restriction of the range of membership to only groups of large enterprises, one level in the value chain or enterprises belonging to the location dictated. Large significance in the failure of cluster initiatives is also played by a lack of trust in the initiatives undertaken by public authorities.

A survey of the reports prepared up to now on the topic of cluster initiatives in various countries enables us to note that the policy of supporting clusters takes on various forms. In reality it does not only vary from the level of analysis accepted and the methodology applied in supporting the process of networking, but also the degree in which the policy based on clusters was initiated, as well as the instruments used for this purpose.

The most frequent elements in the strategies of the development of clusters include:

- Strong competiveness of the economy and the reforms of economic policy in the area of market regulations,
- Supplying strategic information by way of foresight type projects, cluster analysis and internet portals,
- Agencies dealing in contacts with entrepreneurs and units supporting innovativeness e.g. innovation centres;
- Development programmes for the development of clusters financed by public funds;
- Establishment of centres of excellence connecting the industrial sector with the R&D area;
- Adhering to public procurement (public tenders);
- Construction of platform for public and private dialogue.

In many countries the process of clustering was initiated by the establishment of allowances, platform and regular meetings involving enterprises and organizations from the business environment associated with a given branch. The motive for starting dialogue was the results of research projects, particularly the technological foresight, which aroused discussion and prompted joint action. Generally speaking, the process of initiating clusters and other networks of interaction in a dimension of European regions takes on various forms depending on the political culture, way of institutionalizing the dialogue between the public sphere and the private sector, the size of the regional economy, but also depends on the scale of intervention of public authorities in economic life, as well as the degree of industrial and technological specialization of the region.

In the afore-mentioned reports and expert analysis a set of key recommendations in the area of initiating policies based on clusters indicates the factors of success listed below (IBNGR, 2002):

- The main role should be accepted by the sector of enterprises, however public authorities take on the role of a catalyst in the development of the cluster in question. In such an arrangement, the expansion of the public and private sector partnership is key,
- The aims of the initiated policies should be transparent and measurable,

- Clusters should be built on the basis of existing potential and avoid creating initiatives in branches which are not sufficiently developed or generally do not appear in a given location,
- The presence of a large enterprise in a given branch which is seen positively as a source of new technologies, acquisition of expertise, client base and suppliers, as well as space for the development of human resources,
- Adequate technical infrastructure is essential together with a developed network of transportation and telecommunication connections, as well as an accessible base of attractive real estate for investors. Institutional mechanisms are helpful here in the form of entrepreneurial incubators, scientific, technological and industrial centres, due to the conditions of mutual work in a specified physical space offered by them;
- The presence of an entrepreneurial spirit, especially among employees of a scientific and research unit and large innovative enterprises which is to lead to the formation of spin-off and spin-out firms;
- The possibilities of access to financial capital in the form of high risk capital (venture capital), networks of investors searching for innovative and prospering enterprises (the so-called business angels), loan funds and finally public programmes, finance programmes e.g. EU funds;
- The development strategy of a cluster should be realized at an appropriate level of local government which facilitates the effective initiation,
- In the initial phase of development of a cluster an analysis of the potential or existing concentration of enterprises of a given branch should be analysed making use of the existing clusters in other locations. The results of this analysis should be used for public debate with the aim of working out a wide social consensus,
- The action taken should enable the increase in the specialization of cooperating enterprises and institutions with the aim of realizing economies of scale and range, division of labour, as well as development on a local scale of specialized factors of production which facilitates the strengthening of the competitive position of the cluster,
- Using the benefits accruing from the geographical proximity should be promoted by the establishment of associations of sub-suppliers or other forms of mutual interaction (e.g. associations of mutual credit guarantees) stimulating diffusion of knowledge and technology, as well as the processes of mutual learning,
- In the case of highly technological clusters, one of the fundamental activities should be acknowledged as stimulating and creating flexible interactions at the level of industry and the academic sector,
- For the achievement of success, it is essential to build clusters on the basis of formal and informal networks of interaction within which the information flows can take place. This type of social network that emerged on the basis of a high level of trust and social capital can be stimulated by strong institutional structures divided by cultural values and common goals;

- The market success of a cluster is conditioned by the access to the base of skills understood as the highly skilled workforce;
- Mechanisms should be created that enable resignation from cluster initiatives in the case of their failure.

In summing up, the results of the analysis of the conditioning of the initiated innovative policy directed at clusters, it should be first and foremost underlined that the key aim of this policy should be to strive towards the creation of a long lasting competitive advantage in the economy of the region. The way for achieving the afore-mentioned aim can become a strong innovative cluster or group of smaller innovative clusters functioning within the framework of a coherent system of innovation. The policy based on clusters should be supported by a set of other complementary actions within the framework of related policies, which leads to the gaining of synergy effects. This is therefore the policy which penetrates into other policies and in its own essence takes on a nature of horizontal activities. The concept of clusters is according to other models of development for innovative regions and should be treated in this way as a supplement for the models of the learning regions, regional systems of innovation and the innovative environment. All the afore-mentioned theories of regional development are based on the network paradigm of innovation and enable local spatial arrangements to meet the challenges of the global knowledge economy.

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