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ALINA PIĄTYSZEK-PYCH[1]

Determinants of the emergence and the development of clusters

1. Introduction

In the days of advancing economic integration, when the absorption, creation and knowledge as well as innovation diffusion capacity has become a crucial factor of the international competitiveness of businesses, regions and national economies, it has become necessary to search for solutions enabling entrepreneurs eliminating threats and using opportunities, which are inherent in the process of globalization. These are the actions aimed at the stimulation of the competitiveness and the innovation of regions through creation of the effective, comprehensive and complementary mechanisms for supporting functioning of companies and for improving the business environment that have become one of the most important priorities of the modern economic policy. The implementation of such objective is ensured by actions focused on supporting creation and development of cluster structures in the region. The interest in the concept of the economic clusters arises from the fact that their functioning brings

M.Sc. Alina Piątyszek-Pych
University of Zielona Góra

1 The author is a scholar within Sub-measure 8.2.2 Regional Innovation Strategies, Measure 8.2 Transfer of knowledge, Priority VIII Regional human resources for the economy Human Capital Operational Programme co-financed by European Social Fund and state budget.

measurable benefits for both enterprises and entire regions, in which they are present. The starting point for the selection of appropriate tools supporting the development of the cluster structures is the identification of the factors determining the formation and the development of bunches.

These are the clusters defined by M. Porter (2000, p. 16) as *geographical concentrations of interconnected companies, specialized suppliers, service providers, companies operating in related sectors and institutions associated with them (e.g. universities, standardization bodies and trade associations) competing but also cooperating one with another in particular fields"* that are the subject to the analysis in this paper.

The aim of this article is to systemize the most important concepts defining determinants of functioning of cluster structures. The achievement of such formulated goal required carrying out a thorough review of both Polish and foreign literature on the issue of bunches. Due to the volume restrictions of this article, there were presented only the selected, according to the author most interesting, concepts associated with the issues of success factors of bunches. The author's attention was focussed on the analysis of the factors determining the success of any cluster at the stage of its creation (the determinants of the emergence and creation of bunches) and of its development (determinants of functioning).

It is in the article that the theoretical problems related to the issues of bunches of enterprises were discussed. In the first part of the article, there were presented endogenous and exogenous factors determining the formation of cluster structures. It is later in this article that the factors determining the development of bunches were described with particular emphasis on the sources of the competitive edge of the location. It is at the end of the article, further to the deliberations carried out, that conclusions and recommendations for the best ways of supporting cluster structures were presented.

2. The factors supporting the formation of bunches

The literature does not clearly indicate the causes and mechanisms of the emergence and development of bunches. According to many theoreticians and practitioners dealing with the issues of bunches, it is impossible to present a comprehensive list of determinants of functioning of bunches. The conditions for the emergence, formation and later for the development of clusters can be of geographical, historical, economic, social or political nature.

The factors affecting the emergence of bunches can be divided into endogenous and exogenous ones. The main difference amongst the identified factors results

from the approach towards the way of the cluster creation. These are traditional location factors and historical conditions appearing at a certain point of time that are premises of endogenous nature representing a stimulus for formation of clusters. It is in the second case that we deal with considerable interventions and efforts of central and local authorities or research and development units and business support organizations, and sometimes even of enterprises themselves, within the scope of identifying opportunities for creation and development of clusters. A number of organizational, communication and financial incentives towards potential members of the cluster are applied in order to create it.

In particular, the endogenous factors include: traditions resulting from the existence of the activity of the given kind on the defined area, a favourable location (for example: existence of specific natural conditions enabling construction of hydroelectric power plants or proximity of a river enabling transportation by barges), good communication connections, a high level of technical infrastructure, access to certain natural and human resources, appropriate living and employment conditions, existing refined market demand, the potential of the market, availability and quality of a research centre, access to specialized knowledge and skills, presence of FDI in the region, prior existence of the supply industry, of the related sectors or of the entire related bunches and the like (Szultka 2004, pp.10-11). The more of such factors the given location has, the higher the probability is that clusters will be formed and will survive. Since the majority of so-called soft factors as knowledge, skills, standards and norms or social activity, develops in the long term, the possibility of their conscious and planned development in a short term is very limited. Endogenously formed clusters are durable and resistant to crisis. Enterprises operating in such clusters have many advantages resulting from their location. A crisis concerning entire industries or economic sectors can become a threat to the bunches formed on the basis of endogenous factors, because, as a rule, they take the form of spatially concentrated small and large companies operating in one industry (Zaorska 2002, p. 69). The creation of bunches in the given region can be also a result of a coincidence i.e. the creation of the company in the given location is a result of entrepreneurial activities, which cannot be explained by favourable local conditions or of artificial creation of the cluster e.g. through creation of a science park or huge investments in the development of a strong research centre.

It is in the case of exogenous bunches that the leading entities, which not only concentrate other business entities around themselves but also initiate actions of different kind in the cluster and represent members of the cluster towards

entities from surroundings, play an important role. The exogenous factors conditioning the existence of bunches include among others: a high level of spatial development of the region, a good level of technical infrastructure, proximity to absorbent domestic and foreign markets, presence of enterprise zones in the region, presence of numerous large enterprises, attractive prices of properties, little bureaucracy, a level of regulations, low cost level of procedures, high activity of some local governments in attracting investors, high culture and industrial traditions at the selected locations, etc. (Pasieczny 2006, p. 95).

A group of entities formed as a result of exogenous processes can become a cluster if: it is a spatially compact group, there are strong ties amongst entities and the cluster creation is coordinated by a leading entity having resources at its disposal. It is also the presence of entities being members of the cluster, such as: enterprises (ready to cooperate with competitors in some aspects of their operations), research and development centres (being able to contribute innovations, technology and know-how to such cooperation), business support institutions and public authorities at the given location that is necessary for the emergence of the bunch.

The concentration of business entities on the given geographical area itself, the presence of traditional location factors or historical circumstances and actions taken by the civil service in the certain moment of time do not guarantee the transformation of the group of enterprises into cluster structures and also do not decide on their success. There are many factors that decide on the success of the cluster.

S. Steilne, H. Schiele (2002, pp. 851-854) presented a group of internal conditions, whose existence is necessary for cluster creation. They divided the conditions into two basic categories:

1. The necessary conditions, without which it is impossible to create a cluster:
   1.1 Divisibility of manufacturing processes into individual stages enabling specialization as part of value creation processes. On one hand, the fragmentation of manufacturing processes depends on technical aspects On the other hand; it is possible to conclude that the fragmentation of manufacturing processes is possible only at an appropriate critical mass of both the relevant partners as well as the size of the companies. Simultaneously, the activity of the entities must be enough extended so that the existence of a few enterprises at every stage of the value creation chain is possible which will enable healthy competition and learning one from another.

1.2. Possibility of transportation of the product. If there is no possibility of transportation of the final product, the location of its production is determined by the location of customers. Both industrial products and services should be mobile. It is also taking into account the possibilities of transportation of both final products as well as its components that matters greatly. It is in the situation, in which there is a possibility of transportation of the final product but the materials, of which it is manufactured, are strongly connected with the given location that the given territory attracts strongly producers of final goods which supports the creation of the cluster.

2. The sufficient conditions, which include:
   2.1. A long chain of value creation. It is the coordination of many components in order to manufacture the end product that fosters the creation of the cluster. The more specialized the group is, the more the competitiveness depends on the components of the complementary partners and the process of organizing its environment becomes more important. In such situation, the number of connections amongst all entities increases. Such a situation is typical for a highly fragmented system of value creation. The coordination of activities is important already at the stage of supplies in the situation, in which instead of standard indirect inputs, there is the need to provide the necessary components tailored to individual customer needs. The long value creation chain should be developed only if it is determined by technical reasons. The diversified optimal production level of individual enterprises allows for achieving economies of scale. The other reason for the division of the value creation chain is the different profitability of its individual segments.
   2.2. Numerous and diversified but complementary competencies. Creation of a cluster is supported by the presence of the complementary but different knowledge within one value chain. The more different skills within one value chain, the more difficult it is to control them by one enterprise. It is as a consequence of such situation that the problem of coordination of different partners arises; each of them concentrates on different competencies.
   2.3. The role of innovations. An important condition sufficient for creation of a cluster is the importance of innovations in the industry. The more complementary actors support the innovation process and the shorter the time for their coordination is, the more the efficiency of their cooperation

becomes a success factor for the bunch. If the industry does not honour innovations, then any benefit arising from the coordination of the innovative entities does not bring any financial benefit.

2.4. Market changeability. The process of creation and development of clusters is supported both by the changeability and the dynamics of the market, which mean the lack of control over the demand-induced part as well as high diversification of the demand requiring offering individualized products. The cooperative relations, much more than hierarchical ones, support faster adaptation of the entities to the changing environmental conditions.

According to P. Wieczorek (2008, pp. 84-85), it is for creation of a cluster that the simultaneous presence of the following conditions is necessary: (1) location closeness of participants in the cluster necessary for appearance of positive effects of diffusion and using the same resources, (2) multilevel relations occurring amongst participants in the cluster, (3) perceiving the cluster as an effective instrument for realization of business needs of enterprises, (4) existence of the potential for the partnership and the cooperation of entities based on professionalism, loyalty and respect in the region, in which the cluster is supposed to function, (5) support of local authorities and interest of the business environment institutions in the cluster creation.

J. Staszewska (2009, p. 41) lists the following factors necessary for creation of clusters in the exogenous way: (1) good communication amongst participants in the cluster, (2) determination of the purpose of activity of the cluster in a clear, measurable, real and located in time way, (3) involvement of different circles, which can appoint the so-called initiative group, in the creation process of the cluster structure, (4) existence of the moderating entity, which is trusted by the environment and which acts in the interest of the structure, rather than of its individual entities, (5) low costs of starting and running business activities, (6) high activity of business environment institutions.

3. The sources of the competitive edge of the location and the development of bunches

A cluster has to be competitive in order to be successful. Clusters exist in a particular economic environment, which affects their ability to compete and can both hamper and facilitate the development of bunches.

M. E. Porter (1990, p. 71) indicated four external determinants for the competitive edge and thus the development of cluster structures, i.e.: resources

of production factors (quality, costs and specialization of production factors), demand conditions (refined and requiring local customers), supporting and related sectors (industries) (the presence of good suppliers and competitive related sectors at the location), the context of the strategy and the structure and rivalry amongst companies. The factors mentioned above create so-called the cluster's competitive diamond. The model suggested by M. Porter describes the interdependence relations amongst all factors and, in the opinion of the researcher, is the driving force for the cluster at the microeconomic level. On one hand, the presence of the factors mentioned in the competitive diamond in the given region enables the emergence and the development of effective industrial clusters on this area, on the other hand, functioning of the bunches develops the factors mentioned above in the region making it more competitive.

The factors similar to the diamond of Porter are also mentioned by T. Padmore and H. Gibson in the GEM concept of cluster (En. Groundings - Enterprises - Markets). The GEM-Methodology was developed to evaluate the strength and the efficiency of the given cluster. The researchers extended the M.Porter's diamond model by distinguishing six determinants of the cluster competitiveness, which were grouped within three areas (Padmore, Gibson 1998, pp. 58-62, Okoń-Horodyńska 2000, pp. 22-24):

- supply-side determinants being the components of the manufacturing process from outside of the cluster, which include resources and infrastructure,
- structural determinants affecting the effectiveness of the production in the cluster associated with the presence of suppliers and related industries as well as with the structure and strategies of companies,
- demand determinants taking into account the final as well as the indirect (created in the cluster) demand (they cover local markets and the access to external markets).

The individual competitiveness determinants proposed in the GEM method coincide with vertexes of the diamond of M. Porter. The synthetic comparison of the determinants proposed in the GEM method with the competitiveness determinants of the cluster proposed by M. Porter is presented in the table below.

The authors of the GEM method emphasize the special importance of the structural determinants in the development of bunches. It is in their view that not every concentration of the industry constitutes a cluster, and these are effective connections above all that are the signs of the distinctive features of clusters (Szerenos 2008, p. 37).

It is in order to determine the competitiveness degree of a cluster and hence its prospects for development that the expert method is applied. Each of the six

determinants of the cluster is assessed by assigning the appropriate number of points in the scale from 1 to 10. The cluster is considered as competitive, if it maintains or increases the market share at an average or above average return on investment from its main product line. The cluster with evaluations of each of the features on the level 5 is considered as poorly competitive (Szultka 2004, p.16).

Table 1. The factors determining competitiveness of bunches

	GEM-METHODOLOGY	Porter's Diamond
Supply determinants	Resources: • Natural resources, so-called inherited ones e.g. forests, land, mineral deposits, strategic geographical location • Resources developed in the given region: qualified mobile workforce, financial capital and technology.	Conditions of production factors: • Quality and costs of production factors (input): - of natural resources, - of human resources, - of capital resources, - of material, administrative and of science and technology infrastructure, • Quality of factors • Specialization of factors
	Infrastructure: • Physical (hard): roads, ports, airports and transport infrastructure. • Institutional (soft): business associations, research laboratories, training systems, regulations and tax systems, monetary policy of the state, financial markets, climate for business and employment, quality of life, etc.	
Structural determinants	Suppliers and related industries: • Suppliers: diversity, quality, costs and efficiency of local suppliers as well as quality of links buyer-supplier. • Affiliated companies: the number and the quality of the associated companies and the existence of formal and informal links amongst them and other companies of the cluster	Related and supporting sectors: • The presence of good suppliers at the location • The presence of competitive related sectors
	The structure of companies and their strategies: the number, the size, the frequency of „the birth and the fall", the ownership, financial strength and competition strategies, which the core and the essence of the cluster tied together into the value creation chain of the given product or service.	The context of the strategy and the competition amongst companies • The local context encouraging to appropriate types of investments and constant improvement • Increased competition amongst local rivals.

Demand determinants	Local markets: the size of the markets, their share in the domestic or global market, growth and prospects, local possibilities for extending sales, expected quality standards, diversity and distinctive features of the local demand as well as willingness of the buyers to cooperate with the local cluster.	Demand conditions: • sophisticated and requiring local customers. • Needs of customers are ahead of the needs appearing somewhere else. • Unusual local demand in special sectors, which can be satisfied on a global scale.
	Access to external markets: the proximity of external markets, the size and the growth of the share of the region in those markets, the share of the cluster in the global market, characteristics of the users, existing market relations, entry barriers and barriers to trade.	

Source: own study on the base: Padmore, Gibson 1998, pp. 58-62, Okoń-Horodyńska 2000, pp. 22-24, Porter 2000, p. 20

4. Determinants of success and development of a cluster

The presence of the necessary and sufficient conditions for emergence of bunches on the given geographical area does not guarantee their development and does not decide on their success. It is necessary to identify the factors determining the development of the formed cluster structures, whose lack implies inevitable disintegration of the cluster.

Over the last two decades a lot of research and comparative analysis of cluster structures in Poland and abroad have been carried out. It is on this base that crucial factors determining the success of development of bunches have been identified. It is necessary to provide some resources (e.g. human, financial or infrastructural ones) and to create the conditions supporting cooperation so that the cluster could develop and increase its competitiveness. The existence of the proper system of communication amongst parties of the cluster, which will provide the atmosphere of cooperation and will enable new contacts and partnerships, is crucial. Besides the aspects related to the members of the cluster and the relations amongst them (internal environment), it is also the environment, in which the cluster operates, that plays an important role (external environment).

R. Moss Kanter and S.A. Rosenfeld indicate the following crucial internal factors of the development of bunches (R. Moss Kanter 1995, S. A. Rosenfeld 2002, pp.7-9, Górzyński, Pander, Koć 2006, p. 21):

1. „Flexibility" and „openness" of the cluster structure enabling access to new technologies, knowledge and information. Innovation, imitation and

entrepreneurship are the driving factors for the development of clusters. While success of an individual company depends on its ability to protect its technological achievements, new products and projects, the success of a cluster depends on diffusion of knowledge, on widespread access to innovations and information, and on creation of new companies of the spin-off type[2].

2. High quality of links and mutual confidence in relations amongst actors of the bunch. Links and confidence are crucial success factors for the effective functioning of the mechanism of the information and knowledge diffusion. The clusters being the most successful ones create the mechanisms being able to speed up the flow of ideas, innovations and information amongst the enterprises. It is the rapid development of clusters, rather than achievements of individual entities that creates learning regions and innovation environments. The mechanisms and the entities collecting and disseminating knowledge (i.e. the entities, which encourage and facilitate all forms of associative behaviours) ensure the high level of the social capital, which is essential for the competitiveness of the cluster. It is necessary to create a network of links amongst the members of the cluster so that the diffusion of knowledge in clusters could appear. It is the networking that enables transferring and spreading ideas, information and good practices in the entire cluster and facilitates their absorption from the outside.
3. The competence level and the quality of human resources. It is a decisive factor of effective transfer and diffusion of knowledge. The high competence and skill level of employees is one of the most important success factors of enterprises. Since the modern companies become more and more dependent on applying high technologies, they demand more and more qualified, educated and talented employees. The success of many clusters is determined by groups of innovative enterprises managed by people valuing learning, involved in the development of the local communities and therefore willing to work for the collective vision of their industry. The ability of the region, in which the cluster operates, to attract talent plays an important role in development of the cluster. It is not only the remuneration that attracts talent

2 A *spin-off* company is described as an entity that is the result of self-empowerment of employees of the parent entity, using its material and intellectual potential, while a parental entity is considered both the enterprise as well as academic and research units. A feature that distinguish the spin-out from the spin-off company is a relationship with the parent organisation. *Spin-off* companies operate in isolation from the parent organisation (*Innowacje i transfer technologii. Słownik pojęć* 2008, pp. 13-14, 97-98).

but also the possibility for interacting with other specialists from the field as well as the potential for professional development and the membership in local professional associations. Less developed peripheral areas face serious problems with keeping the best and the brightest graduates. They go frequently to the regions, which can offer places for rest and recreation, access to cultural centres and provide access to so-called good jobs. The other factor of success of bunches is also the presence of institutions, persons and organizations in their area, which store and disseminate unsubstantiated knowledge (so-called tacit knowledge). The knowledge of this type is accumulated and disseminated by research and technology centres and their staff, educational institutions and their teachers as well as enterprises and their employees.

It is amongst the factors determining the development of bunches that the ones are mentioned most often, thanks to which it is possible to determine the possibility of the emergence of bunches in the given area as well as to identify and to assess the potential for development. According to S.A. Rosenfeld (1997, pp.3-23), it is possible to identify twelve factors determining formation and later development of a cluster:

1. Availability of capital: participation of local financial institutions (mainly banks) in the process of creation and development of the cluster and the availability of capital required by companies being in the bunch to take advantage of market opportunities.
2. Efficiency of the R&D sector: the efficiency of regional R&D institutions and the possibility of obtaining support by companies being in the cluster from specialized public and private research centres or individual experts that provide the members of the cluster with cutting-edge research and solutions of most urgent problems.
3. The proximity of suppliers: the presence of primary and secondary suppliers in the area of the cluster and in its direct surrounding, of sources of raw materials and the intensity of links amongst companies in the cluster and local suppliers.
4. The access to equipment and machinery manufacturers: the presence of the companies dealing with the production of machinery, devices and software, used by the members of the cluster in the cluster and its surrounding. An important role in development of cluster structures is played by quality and intensity of relations amongst the companies forming the core of the cluster and the companies dealing with the production of machinery and devices.
5. The access to specialized services: the presence of specialized public services in the form of technology development centres or the SME sector and public

organizations offering support for the export activity as well as services provided by designers, lawyers or accountants in the area of the bunch.

6. The developed social infrastructure: the amount, the kind, the size and the degree of the activity as well as the frequency of the cooperation of the regional business environment institutions, civil organizations or trade organizations.
7. Knowledge and skills: matching the knowledge and the skills of the workforce to the needs of the cluster. The workforce should possess not only technical competences and skills but also the general knowledge on the specificity of the sector and the entrepreneurship.
8. Human resources development: education and training possibilities for employees to take industry-specific professions and in the future, for additional training and preparation of personnel for technological and organizational changes occurring in within the bunch.
9. Innovations: the pace and the frequency of the development and of the adaptation of new technologies and of the appearance of the products based on these technologies.
10. Strength of links: an important role in the development process of bunches is plaid by intense and frequent cooperation of the enterprises creating the bunch. The success of the cluster depends on how often and to what extent the companies share resources and information, participate in the manufacturing process or undertake joint marketing actions as well as jointly solve problems.
11. Entrepreneurship: the number of newly established companies in the cluster and the ability of the cluster to attract enterprises from outside of the bunch.
12. A common vision and leadership: the awareness level of enterprises that they operate within one system, sharing the common vision of the development of the bunch and having leaders that maintain collective competitiveness and integrate the companies within the bunch.

While analysing the conditions mentioned above, they can be divided into two fundamental groups: external and internal factors. The first group can include the factors associated with the spatial arrangement of the business structure (the efficiency of the R&D sector, the proximity to suppliers, the access to the manufacturers of machines and devices, the access to specialized services and the developed social infrastructure) and capital determinants (the access to capital). The category of the internal factors includes: the knowledge and the skills, the human resources development, the innovations, the power of links, the entrepreneurship and the common vision and the leadership.

The authors of the study "A practical Guide of Cluster Development" (2004, pp. 5-6) indicate three groups of factors, which are essential for the development of clusters:

- critical success factors: a partnership network, a strong innovative base supported by R&D actions, human capital with high potential of skills,
- factors supporting success: the adequate physical infrastructure, the presence of large enterprises, the strong corporate culture, the access to sources of financing,
- complementary success factors: they can support individual business activities but they are not exclusively aimed at clusters.

S. Szultka (2004, pp.10-11) indicates the factors stimulating the development of bunches taking into account potential advantages resulting from functioning in the cluster. These include:

1. Extension of the offer of the cluster: one of the natural effects resulting from functioning of a cluster is the movement of enterprises operating in the related industries or service companies to the cluster area. This process leads to reduction of costs and provide better and more complete range of offered materials, sub-assemblies and specialized services. It becomes the driving force for further growth of the bunch.
2. Increase in interactions: the location of the entities conducting complementary activity on the given area increases the probability of developing interactions between them. This affects positively the increase in the efficiency of the entities in the cluster.
3. Higher specialization: the presence of potential partners and cooperators contributes to growth of the specialization in production processes.
4. Lower transaction costs: resulting from the formation of the social capital at the given location due to frequent official and unofficial contacts both between employees as well as enterprises. The increase in the level of confidence becomes the cause of the faster flow of knowledge and innovations and thus enables the application of new technological solutions and creates opportunities for using new market opportunities.
5. Reduction of uncertainty: it is associated with direction of the further technological development of the product or of the demand and is a result of the cooperation amongst enterprises and the world of science.

M Górzyński (2006, p. 22) considers as decisive factors for success of development of a bunch the following ones: (1) the high level of competence and human resources, (2) the high level of trust in the cooperation amongst participants in the bunch, (3) "external" orientation of the cluster structure,

i.e. the concentration of the activity on international markets rather than regional ones, (4) the flexibility and the low formalization degree of the cluster structure, (5) friendly institutional and legal environment, (6) the creation of cluster structures in the areas with the high chance of development. The first four factors mentioned above are internal factors, while others are related to the environment, in which the cluster operates and they are referred to as external factors.

It is in our times that the role of the non-economic (socio-cultural) factors determining the development of bunches is clearly emphasized. In addition to technological innovations, complementarity of production and territorial concentration, these are the non-economic factors in the form of non-commercial interdependencies amongst entities in the cluster that play an important role in the cluster development. These include the formal and informal rules of social life, the norms of behaviour and conduct, which create the pattern for actions in the business world. Non-commercial relations are the capital that exists outside the official, traditional institutions and development factors defined as the social capital[3]. The social capital being characterized by a high level of the mutual confidence, by shared commitment to the common wealth and by the dense network of relations amongst individuals and groups plays an important role of an "integration factor" in creation of advanced organizational forms, such as clusters (Tuziak 2008, pp. 20-22).

5. Summary

While analysing internal and external factors determining formation of clusters, the blurring boundary amongst them should be taken into account. The majority of clusters arise as a result of the impact of much diversified forces and factors. Some of them are endogenous, other ones are exogenous and a part of them has a difficult to describe and to explain mixed structure. It is very often that some exogenous stimuli can appear exclusively under the condition of the appearance of certain internal factors and inversely. These factors create complex relations that causes that it is very difficult to indicate clear-cut reasons for formation of bunches.

3 Francis Fukuyama defines the social capital as *„a group of informal values and norms, which are respected by the members of the given group and which enable their cooperation. If the members of the group expect from others honest dealing, on which it is possible to rely, they must trust each other. The confidence is like grease, which improves functioning of all groups and organizations"*(Fukuyama 2000, p. 24).

It is amongst the factors supporting the development of bunches that one can indicate the internal ones related to functioning of the entity in the cluster and the external factors associated with the environment, in which the cluster operates. The development of bunches, similarly as their formation, is a consequence of the presence and mutual penetration of many factors.

It is amongst the barriers to formation and development of clusters that it is possible to mention a number of factors being an inverse image of the determinants mentioned above, which support success of bunches[4]. Since the biggest number of the barriers to the creation and development of bunches of enterprises can be identified in the areas poorly urbanised[5] and being characterized by the lower level of the economic development, the substantial role within the scope of the development of cluster structures is played by actions of public bodies for supporting the bunches. Both central, regional and local official authorities should intensively support the development of factors conditioning success of cluster structures[6]. M. Enright (1998, pp. 303-331) indicates six essential

4 The endogenous barriers to functioning of bunches include among others: distrust amongst partners, low awareness of the units in the cluster on the pro-innovative role of the cluster, high costs of doing business, lack of the habit of sharing profits, the conflict between the science and business world, low willingness to take risks, inadequate policies on promoting entrepreneurship and innovation activities, low levels of social capital (Staszewska 2009, p. 43). Whereas, the exogenous barriers hindering the development of bunches include among others: disastrous transport infrastructure, illegible structure of the real estate ownership, bureaucratic obstacles, lack of appropriate regulations, high costs of procedures, high bureaucratic level, lack of land use planning and the like (Pasieczny 2006, p. 95).

5 It is according to S.A. Rosenfeld that the most important barriers to functioning of cluster structures on poorly developed areas include: lack of physical infrastructure, lack of access to capital, poor quality of the innovative and technological environment, insufficient opening of the business towards external markets, poor quality and insufficient qualifications of human resources (above all lack of appropriate skills and limited possibilities of their acquisition), imposing hierarchization on functioning of cluster structures (Rosenfeld 2002, pp.9-10).

6 While taking actions aimed at supporting cluster structures in the given region, not only barriers to the cluster development but also negative aspects of functioning of bunches should be taken into account, which appear in the long term. Strong formal and informal relations amongst members of the bunch can not only lead to collusive behaviours but also to mergers and acquisitions amongst enterprises that reduces the number of competitors operating in the given industry in the long term. The creation of the specialized labour market adapted to the needs of the cluster can cause high structural unemployment difficult to reduce at the moment of the liquidation of the

elements of the development strategy for cluster structures, which include: (1) improvement in the business surrounding taking into account the needs and expectations of the supported bunches, (2) provision of information and data on economic programs in order to identify development opportunities and threats for providing the possibility of conducting so-called "anticipating actions", (3) constant development of infrastructure and educational and training offers, (4) implementation of effective business networking, (5) financing business support environment e.g. by creation of support institutions for creation of new companies, (6) the process of community creation by development of the better local relations based on the mutual confidence. The creation and then the development of cluster structures in the region requires taking a number of actions, namely: monitoring the economic structure in the region in order to identify potential support areas; creation of institutional and organizational bunch; preparing a professional offer of services supporting the actions of bunches; improvements in the quality of education and training activities and supporting obtaining specialized staff; stimulating and attracting investment in the areas of the activity of bunches; stimulation of innovations and entrepreneurship in the region and taking action aimed at promotion of the region (Rosenfeld 2002, p. 15).

An important role in the development of cluster structures created as a result of top-down initiatives is played by the following actions taken by all actors of the cluster: creation of a cluster management centre, creation of strategies based on mutual confidence and coordination, selection of management methods for the cluster, change management, knowledge and scientific base management, innovation management, improvement of the natural environment, effective acquisition and use of financial resources from the external financial system, creation of stimulating financial system, developing market institutions, promotion

cluster. The relatively large and liquid labour market is good for greater mobility of workers that increases the costs of functioning of companies. The characteristic location of the economic activity for the given cluster can be seen only from the perspective of the particular industry, which discourages potential investors from other sectors to start business in the given location. The rapid development of the given bunch and its expansion can lead to problems associated with the lack of coordination of business activities as well as with information flow and diffusion. The increase in the activity of bunch members leads to higher prices of manufacturing factors and consequently to the increase of operating costs. The high competition level amongst companies located on a small geographical area can lead to declines in profit margins and destructive price wars. Such situation results in increase in lease prices of grounds and real estates as well as in increase in costs associated with human resources (Kaźmierski, 2012 pp. 59-60).

of innovations, increase in expenditure on R&D and their implementation, financing investments in the computer infrastructure, streamlining operations of legal institutions, declaring political support, supporting economic, scientific, self-government organizations and state institutions with the EU funds in the development of initiatives and creation of clusters (Skawińska 2009, p. 178).

The considerations above allow to conclude that the emergence and the development of bunches are a result of interaction of a number exogenous and endogenous factors. The actions aimed at stimulation and development of the success factors of bunches mentioned above should be taken by all actors of the cluster, i.e. enterprises, R&D institutions, business support institutions and official authorities in order to ensure the effectiveness of the cluster structures.

Summary

Determinants of the emergence and the development of clusters
The aim of this article is to systemize the most important concepts defining determinants of functioning of cluster structures. The achievement of such formulated goal required carrying out a thorough review of both Polish and foreign literature on the issue of bunches. Due to the volume restrictions of this article, there were presented only the selected, according to the author most interesting, concepts associated with the issues of success factors of bunches. The author's attention was focussed on the analysis of the factors determining the success of any cluster at the stage of its creation (the determinants of the emergence and creation of bunches) and of its development (determinants of functioning). It is in the article that the theoretical problems related to the issues of bunches of enterprises were discussed. In the first part of the article, there were presented endogenous and exogenous factors determining the formation of cluster structures. It is later in this article that the factors determining the development of bunches were described with particular emphasis on the sources of the competitive edge of the location. It is at the end of the article, further to the deliberations carried out, that conclusions and recommendations for the best ways of supporting cluster structures were presented.

Keywords: *clusters, success factors of bunches, sources of the competitive edge of the location.*

Streszczenie

Determinanty powstania i rozwoju klastrów

Celem artykułu jest systematyzacja najważniejszych koncepcji określających determinanty funkcjonowania struktur klastrowych. Osiągnięcie tak sformułowanego celu wymagało przeprowadzenia gruntownej analizy zarówno polskiej jak i zagranicznej literatury poświęconej problematyce gron. Ze względu na ograniczenia objętościowe artykułu przedstawione zostały wybrane, zdaniem autora najciekawsze, koncepcje związane z problematyką czynników sukcesu gron. Uwaga autora skupiona została na analizie czynników decydujących o sukcesie klastra na etapie jego powstania (determinanty powstawania i budowania gron) i rozwoju (determinanty funkcjonowania). W artykule omówione zostały teoretyczne zagadnienia związane z problematyką gron przedsiębiorstw. W pierwszej części opracowania przedstawione zostały endo- i egzogeniczne czynniki warunkujące powstanie struktur klastrowych W dalszej części artykułu przedstawiono czynniki warunkujące rozwój gron ze szczególnym uwzględnieniem źródeł przewagi konkurencyjnej lokalizacji. W zakończeniu, w nawiązaniu do prowadzonych rozważań, przedstawiono wnioski i rekomendacje w zakresie najlepszych sposobów wspierania struktur klastrowych

Słowa kluczowe: *klastry, czynniki sukcesu gron, źródła przewagi konkurencyjnej lokalizacji.*

References

1. *A Practical Guide to Cluster Development,* (2004) A Report to the Department of Trade and Industry and the English RDAs by Ecotec Research & Consulting, Londyn.
2. Enright M. (1998), *The Globalization of Competition and the Localization of Competitive Advantage: Policies toward Regional Clustering*, Paper presented at the Workshop on the Globalization of Multinational Enterprise Activity and Economic Development, University of Strathclyde, Glasgow.
3. Fukuyama (2000), *Wielki Wstrząs. Natura ludzka a odbudowa porządku społecznego*, Politeja, Warszawa.
4. Górzyński M. (2006), *Systemy wspierania gron na obszarach słabo zurbanizowanych i charakteryzujących się niższym poziomem rozwoju*

gospodarczego, w: E. Wojnicka (red.), *Analizy – wspieranie gron przedsiębiorczości na Podkarpaciu*, Instytut Gospodarki Wyższej Szkoły Informatyki i Zarządzania w Rzeszowie, Warszawa-Rzeszów.
5. Górzyński M., Pander W., Koć P. (2006), Tworzenie związków kooperacyjnych między MSP a instytucjami otoczenia biznesu, PARP, Warszawa.
6. *Innowacje i transfer technologii. Słownik pojęć* (2008), K. B. Matusiak (red.), PARP, Warszawa.
7. Kaźmierski J. (2012), *Rozwój i zarządzanie strukturami klastrowymi w regionie,* Wydawnictwo Uniwersytetu Łódzkiego, Łódź.
8. Moss Kanter R. (1995), *World Class: Thriving Locally in the Global Economy*, Simon & Schuster, New York.
9. Okoń-Horodyńska E. (2000), *Jak budować regionalne systemy innowacji,* „Polska Regionów" nr 15, IBnGR.
10. Padmore T., Gibson H. (1998), *Modeling regional innovation and competitiveness*, w: J. de la Mothe, G. Paquet, *Local and regional systems of innovation*, Kluwer Academic Publisher, Massachuset.
11. Pasieczny J. (2006), *Czynniki i uwarunkowania procesu tworzenia i rozwoju klastrów*, w: E. Bojar (red.), *Klastry jako narzędzia lokalnego i regionalnego rozwoju gospodarczego*, Wydawnictwo Politechniki Lubelskiej, Lublin.
12. Porter M. (1990), *The Competitive Advantage of Nations*, Macmillan, Londyn .
13. Porter M. (2000), *Location, Competition and Economic Development: Local Clusters in a Global Economy*, "Economic Development Quarterly" Vol.14, No.1.
14. Rosenfeld S.A. (1997), *Bringing business clusters into the mainstream of economic development*, " European Planning Studies" Vol. 5, No. 1.
15. Rosenfeld S.A. (2002), *Creating Smart Systems. A guide to cluster strategies in less favoured regions*, Regional Technology Strategies, Carrboro.
16. Skawińska E. (2009), *Sieci przedsiębiorstw a klastry biznesowe*, w: E. Skawińska, R.I. Zalewski, K*lastry biznesowe w rozwoju konkurencyjności i innowacyjności regionów Świat-Europa-Polska*, PWE, Warszawa.
17. Staszewska J. (2009), *Klaster perspektywą dla przedsiębiorców na polskim rynku turystycznym*, Difin, Warszawa.
18. Steinle C., Schiele H. (2002), *When do industries cluster? A proposal on how to assess an industry's propensity to concentrate at a single region or nation*., "Research Policy" Vol. 31, No. 6.
19. Szerenos A. (2008), *Podaż na Mazowszu a rozwój klastrów*, „Problemy Jakości" nr 10.
20. Szultka S. (red.) (2004), *Klastry innowacyjne wyzwanie dla Polski*, IBnGR, Gdańsk.

21. Tuziak A. (2008), *Wpływ czynników społeczno-kulturowych i instytucjonalnych na zdolność tworzenia klastrów jako przedsięwzięć o charakterze innowacyjnym - ujęcie teoretyczne*, w: D. Bobrecka-Jamro D., W. Jastrzębska, E. Szpunar – Krok, B. Tuziak (red.), *Klastry w agrobiznesie – uwarunkowania funkcjonowania i wpływu na rozwój lokalnej przedsiębiorczości,* Difin, Warszawa.
22. Wieczorek P. (2008), *Klastry w Polsce*, „Kontrola Państwowa" nr 6.
23. Zaorska A. (2002), *Ku globalizacji? Przemiany w korporacjach transnarodowych i w gospodarce światowej*, Wydawnictwo Naukowe PWN, Warszawa.