

Clustering Conception in Poland

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Abstract: Clustering in the economy is not a new process. The clustering has come to Poland after 2,000 years and the development of the concept of clustering dates back to this year. This article is about the development of the concept of clustering in Poland. It concerns the problems of clusters in Poland, in the theoretical part this elaboration. It concerns results from primary sources and it indicates perspectives for clustering in practice, in Poland - in practical parts this elaboration.

Key words: Clusters, enterprise, network.

In Polish cluster policy, identification and enforcement of clustering development processes have been observed. It results from a visible effect comprising an increase in the competitiveness of enterprises and regions in which they operate. The economy becomes a network orientated to a greater extent and interactions among economic and business partners increase. New specialisations have been developed, the R&D sector and internationalisation processes have increased importance. Clusters hitherto existing in Poland stimulated an increase in the effectiveness of entrepreneurs operating therein and even though they are characterised with a diversified economic potential, they became a “locomotive” of many regions. In many clusters a high indicator of partners’ synergy was achieved and thus, led to establishing new values and a faster adaptation of innovative solutions

1. The Essence of Clustering

Network interactions can occur in an organisation or in relations between organisations. Networks constitute a form of organisational coordination of cooperation. They can refer to enterprises supported by academic-research entities, governmental organisations, nongovernmental organisations and

even parties. These are clusters’ network structures

As soon as at the end of the last century, Jarillo referred to an organisation as a network, in which one company took a role of a main organisational controller and the material and nonmaterial inflows between companies ensure meeting final clients’ expectations effectively [1].

A cluster constitutes a specific network form, that is, “a geographical aggregate of companies interrelated and specialised, operating in the same or similar sectors and related with other institutions (university, industrial entities, standardisation entities) in particular industries; competing, but also cooperating among themselves (...). Clusters reaching critical mass and that are successful commercially constitute a characteristic feature of almost each national, regional an even metropolitan economy, mainly in developed countries” [2]. While accepting this definition as a base, one should also consider different forms of interpretation thereof verified in practice. Therefore, in the first years of the 21st century, different approaches to the conception of a cluster were defined and presented by foreign experts, while underlining selected elements of a network. It was reflected in the international literature from this period and, for example:

- Mytelka, L., Farinelli, F., Enright, F., underline concentration of enterprises in a given area and cooperation in the same or related industry and

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services sectors [3, 4];

- Best, M. H. defines a cluster while considering it as a company, in which engaged units transform into a network of entities interrelated with cause and effect relations; the core of such an organisation is made of units specialising in a particular activity [5];

- Ketels, Ch., defines a cluster through the prism of consideration entities creating the network [6];

- Benneworth, P., perceives a cluster in the light of communication and states that this is “a black box, which academic and political threads come from” [7];

- Very popular, apart from the Porter’s one, is the OECD definition of a cluster treating a cluster as “a geographical concentration of similar or complementary enterprises that have active channels to execute transactions and communication, which use specialised infrastructure, markets and services (...) [8].

Thus, while compensating the aforementioned approaches, a cluster can be defined as spatially concentrated aggregates of enterprises interrelated with network relations, using synergy principles in execution of mutual aims, based on the principle of cooperation and preservation of competitive principles, in areas other than mutual, while undertaking cooperation with entities from business and government environment such as, academic entities, research and development entities, administrative entities and others.

2. Typology and Consequences of Clusters

In the view of the aforementioned considerations, it seems crucial to indicate a diversified typology of clusters (see Fig. 1) [9].

In the process of studying the issues related with clusters one cannot be indifferent to the issue regarding consequences for the environment and the enterprises functioning therein. This issue has been signalled in Fig. 2 [10].

3. Assumptions of a Cluster Policy in Poland

In Poland, the Polish Agency for Enterprise Development established “Standardy zarządzania cluster” [11] which should be understood as principles stipulating desired features of management and functioning of clusters, considering, among others, the best practices of the clusters’ activity in Poland and abroad. The standards respond to the problem of unsatisfactory quality of managing clusters and a lack of a system approach to the issue of qualifications of professional coordinators that are of key importance for clusters’ success and effectiveness of public intervention.

The aim of the standards is to enforce the quality of managing clusters in Poland, by:

- Providing clusters’ coordinators with instruments for effective improvement of cluster management processes;
- Providing clusters coordinators with knowledge,

Division criterion	A type of a cluster
A scale and a character of a cluster	Mega, mezzo, micro
Territorial scope	Local, regional, national, international
A development stage	Embryonal, growth, mature, terminal
An establishment of a workplace	Stable, unstable
Sectoral interrelations	Narrow, broad
Production chain stages	Deep, shallow
A competitive position	International, national, average, weak
An organisational structure model	Italian (without formal structure), Danish (governmental initiative, more network orientated), Dutch (government contribution and a significant role of a research centre)
A cluster activity base	Dense, sparse
Functioning status	Functioning, secret, prospective

Fig. 1 Types of clusters.

Level	Consequences
National level (macro)	<p>decreasing costs of a development of highly specialised production areas; decreasing social transfers to the benefit of the unemployed; decreasing unemployment; clusters are considered to be catalysts of economic circumstances, their number is growing along with the economy development; stimulating innovativeness at a level of a whole economy; activating export; attracting foreign investment; increasing competitiveness at a level of a domestic market, positive amendments to the legislation extending productive activities;</p>
Regional level (mezzo)	<p>regional authorities' support for establishing zones of high product specialization (i.e. clusters); an increase in employment; decreasing social transfers to the benefit of the unemployed; mobility of human capital; greater use of IT solutions; development of entrepreneurial behaviours; stimulating innovativeness at a regional level; cluster's success –strengthening local patriotism; beneficial entrepreneurial atmosphere helps to attract investors; creating new workplaces; improving communication; strengthening with investments; an impact on the region's image;</p>
Entrepreneurial level (micro)	<p>costs incurred on the activity are spread over a larger number of entities; lower transaction costs; a possibility to conclude long-term contracts; an increase in sales; an easier and more beneficial access to resources; lower prices; stimulating innovativeness at a level of enterprises; enriching the offer; more accurate market research that allows improving own activity; mutual offer preparation, sales and marketing; increasing the flexibility and promptness of companies' reaction; increasing trust among partners; soliciting new groups of clients for tourism clusters –attracting new tourists; an exchange of information and experiences; increasing the efficiency of applying for aid measures; better skilled staff (effect of mutual trainings); ensuring long-term business for new enterprises;</p>
Commercial	<p>increasing turnovers and financial capacity; a reduction of transaction costs; enriching the offer; enlarging the scope of offered services and care for better quality of a product; expanding markets; reducing costs; capital reinforcement; resource reinforcement;</p>
Non-commercial	<p>joining forces of partners; overcoming barriers in trust; knowledge and information flow; increasing the role of social capital and better division of competences; increasing flexibility; an increase of organisational culture; changing the image of the companies and the region.</p>

Fig. 2 Effects of clustering.

information and support necessary for implementing standards [12].

4. Results of Benchmarking for Clusters in Poland 2010-2015

While analysing situations of clusters in Poland in the period of 2010-2015, one should indicate the following tendencies:

- A majority of bottom-up clusters;
- The most popular form is association, yet the number of companies is gradually increasing;
- The share of enterprises in the general number of members has increased, the number of clusters' members has increased on average by 42%;
- The number of large enterprises having share in clusters has decreased;
- The number of clusters appurtenant to consecutive stages of a cluster life cycle has increased;
- The number of clusters with development strategies has increased to 91% clusters, main aims of the strategy of clusters have been maintained and they concern the development of innovativeness, the second place is taken by the possibility to obtain funds from the EU;
- The position of clusters in the scope of infrastructural resources has improved and the position in the scope of financial resources has decreased, however, there are very significant disproportions between a leader in a given population and its resources and average values obtained by clusters, whereas, the biggest use of resources has been noted in big clusters; clusters are characterised with a large diversity with regard to the level of financial resources. This range seems to stem from highly diversified abilities of clusters to obtain external funds for their activities, mainly from public resources.
- The use of human resources has improved, whereas, total employment in clusters amounts to 96,540 employees;
- Clusters representing particular industries have

not yet covered and represented a significant part thereof at a national level and at a level of particular regions.

• Nevertheless, so far it has not been possible to state that there exists a coordinated support system for clusters in Poland, at a regional or central level. Thus, a strong differentiation of principles regarding the access to the public funds should be assessed rather negatively.

• A decrease in the ability of clusters' members to participate in costs of clusters' functioning. This phenomenon should be assessed as unfavourable.

• A decrease in the amount of obtained public funds;

• A deterioration in the status of clusters' budgets seems to stem from reported limitation of available public funds for clusters' development;

• A tendency of a lack of ability to replace public funds with members' own resources. It seems that a majority of clusters are not mature enough to finance their activity without external resources, including public, effectively and at a high level of activity.

• The amount of fees in relation to obtained benefits are deemed by a majority of clusters as satisfactory;

• A majority of clusters solved basic infrastructural problems related with the functioning of the cluster itself and, in general, the availability of offices or conference rooms for the cluster's needs no longer constitutes a big problem. Currently, it is challenging to develop more advanced infrastructural resources. It stands for the necessity to work in clusters mainly on modernising internal communication channels.

• The number of clusters using modern technological solutions has dropped;

• An increase in the diversification of clusters in the scope of resources, infrastructure, employment and R&D zone;

• Whereas, negative tendencies are visible in the scope of using ICT technologies in the internal communication in clusters;

- With regard to the majority of clusters one can state maintenance of activities in the scope of a mutual offer drawn up by the cluster, at a permanent and relatively high level.

- Low level has been noted in the scope of establishing mutual distribution channels and mutual supply. A lack of a significant advantage of big clusters in the scope of the market activity with their objectively bigger market power and the ability to use more diversified market instruments means that a barrier limiting the clusters' market activity comprises difficulties in reaching an agreement in the scope of undertaking this type of activities, rather than a low economical or tendering potential of clusters. It appears that the projects hitherto executed by clusters have not been bringing proper results in the scope of market expansion.

- Clusters' promotional activity is conducted at a high level and there are no so significant diversifications in this scope.

- Clusters' coordinator inform about a high and even growing regularity of meetings of clusters' members. It is undoubtedly a positive signal proving willingness of clusters' participants to develop cooperation and build trust and, consequently, to exchange knowledge.

- It appears that in the scope of creating knowledge and innovation big clusters have a significant advantage over medium and small ones.

- Over 7% of the increase in employment in entities belonging to the studied clusters should be considered as one of key results of clusters and a prerequisite for their development and validity of the support.

- Enterprises belonging to clusters show higher innovativeness in comparison with average results in the whole population of enterprises. Natural feature of clusters as pro-innovation environment is confirmed. The influence of clusters on the innovativeness of enterprises has already been noticeable, however, the scale of this influence is not yet satisfactory.

- High activity of a coordinator in stimulating cooperation among cluster members: organising meetings, conferences, the exchange of information and in the scope of obtaining public resources to the benefit of cluster's development.

- Clusters' expectations from coordinators concentrate on improving promotion and facilitating the availability of financial centres along with increasing the access to the R&D zone.

- Clusters have a significant, if not decisive, impact on changing attitudes in local and regional environments. Creation and development as well as successes of cluster initiatives establish trust to economic and social cooperation by giving a good example. Clusters should be perceived as a key and particularly valuable element of establishing social capital in Poland.

- A competitive position of clusters has deteriorated owing to the decrease in the number of participants attracted to a cluster, a number of executed projects and decreasing start-ups and/or spin-offs in a cluster.

- Regional conditions, the policy of public authorities to the benefit of a cluster's development, cluster's institutional environment and management [13].

5. Results of the “Raport i inwentaryzacja klastrow w Polsce za 2015 rok” (“Report and Inventory of Clusters in Poland as of 2015”) (Issued by the Polish Agency for Enterprise Development-PARP) [14]

During the inventory taken by the Polish Agency for Enterprise Development 134 clusters were identified in Poland (status as at the beginning of October 2015). The geographical distribution of clusters (in accordance with the coordinator's registered office) is uneven, however, it includes all 16 voivodeships, out of which a majority are situated in Silesian and then, Mazovian Voivodeship. Analysed population of 134 clusters was being

established through last twelve years, i.e. between 2003 and 2015. Two oldest clusters were established in 2003 (Dolina Lotnicza/Podkarpackie and Kotlarski Cluster/Greater Poland), and the majority of clusters were established as follows: 2007–15 clusters, 2011–26 clusters, 2012–21 clusters, 2014–16 clusters. Over 60% of inventoried clusters were established in 2011–2015 (81 clusters). The oldest clusters have existed for 12 years and an average age amounts to over 4 years. In the identified population of clusters, there are in total 5,868 entities operating, the number of which in particular clusters fluctuates from 8 to 171 (on average almost 44 members). The biggest employment in cluster entities is noted in Podkarpackie, Lesser Poland, Silesian and Pomeranian Voivodeships. Mature clusters (i.e. established before 2011) constitute 40%, whereas, young clusters established in the years 2011–2015, as many as 60%. Comparison with other countries also indicates that Polish clusters include young or very young structures, only at the beginning of their development. Their size and membership (structure) indicate that in comparison with their counterparts in Europe or in the world, they have not yet even reached a medium level of development. Only 69% of identified clusters have a development strategy in a form of a document and ¼ of clusters do not have a strategy at all or have not given relevant data, which can be also interpreted as a lack of a strategy.

The biggest number of clusters has a form of associations, limited liability companies and foundations. Cluster specialisations mainly concern ICT, energetics, construction, medicine and tourism. In total, clusters executed 360 projects and an average amounted to over 3 projects funded with external public sources and approximately 60 projects funded with private sources.

A majority of clusters (70%) is at a disposal of a training infrastructure, whereas, only 25 % of clusters have their own research centres.

Analysed clusters cooperate mainly with partners

from the European Union States, but also with countries outside of the EU. Partners situated in the following countries of the Eastern Europe: Ukraine–10 clusters, Belarus–2 clusters, Russia–8 clusters. Clusters also have partners in the following non-European countries: the United States–9 clusters, China, Japan, Canada and Mexico–3 clusters each, Australia, Korea and United Arab Emirates–1 cluster each.

In 73% of clusters coordinators undertake the following activities: promoting, counselling, rendering available infrastructure, trainings, integrating members by organising meetings.

As a result of the researches, 106 aggregations not fulfilling all requirements of a cluster, but treated as potential clusters were selected. An average age of potential clusters amounts to 4.5 years. Potential clusters mainly group in the Mazovian Voivodeship and the ICT and tourism constitute domineering sectors. Potential clusters have opportunities to transform into clusters “of full value” provided that coordinator’s and cluster members’ activities are activated. In many cases, in order to fulfil criteria defining a cluster, a coordinator together with entities constituting a cluster must renew and possibly formalise their cooperation and strengthen their basic structure of a cluster with participation of enterprises, academic entities and business environment institutions.

In Polish cluster policy, identification and enforcement of clustering development processes have been observed. It results from a visible effect comprising an increase in the competitiveness of enterprises and regions in which they operate. The economy becomes a network orientated to a greater extent and interactions among economic and business partners increase. New specializations have been developed, the R&D sector and internationalisation processes have increased importance. Clusters hitherto existing in Poland stimulated an increase in the effectiveness of entrepreneurs operating therein and

even though they are characterised with a diversified economic potential, they became a “locomotive” of many regions. In many clusters a high indicator of partners’ synergy was achieved and thus, led to establishing new values and a faster adaptation of innovative solutions.

It is forecasted that the map of clusters in Poland will concentrate on three groups: clusters constituting local potential, key regional clusters and key national clusters recognised in the world. The conception also concerns developing universal methods of support for clusters of all regions. The support will be mainly directed at outstanding clusters, selected by means of a competition procedure supervised by the Competition Commission appointed especially for this purpose. Stipulating cluster assessment criteria will be of a universal character and will concern issues related with: compliance with the strategic direction of a national and regional development, having relevant critical mass and development potential, with conducted partnership, experience and potential of a coordinator as well as the ability to mobilise private resources.

Three directions of support are forecasted: -for specific initiatives, coordination function and cluster stakeholders also from business environment. -stimulating internal interactions of knowledge and cooperation flows. In the view of the foregoing, basic aims for clustering in Poland for 2020 have been indicated, among others:

- Increasing external networking of clusters;
- Reinforcing integrated planning processes;
- Increasing the number of innovative products and services;
- Reinforcing private investments in clusters and increasing foreign investment inflow;
- Increasing private inputs to the research and innovative activity;
- Development of cluster environment institutions (education, research entities, academic parks and innovation and technology centres);

- Increasing effectiveness of using public inputs.

For the purposes of achieving the enumerated aims the application of the following principles is forecasted:

Principle 1 of broad support for networking processes;

Principle 2 of joining bottom-up and top-down approach in establishing clusters;

Principle 3 of establishing an effective system of institutions supporting a cluster;

Principle 4 of concentration of public support on stronger or promising clusters;

Principle 5 of selecting leading specialisations for a country;

Principle 6 of concentrating policies and public instruments around key clusters;

Principle 7 of private co-financing of clusters’ development.

6. Conclusions

(1) In the identified population a majority of clusters are young.

(2) As a rule, a geographical distribution of clusters reflects the economic potential of regions.

(3) Cluster’s development on the grounds of a strategy is still not standard.

(4) Clusters execute few projects.

(5) Clusters are not at a disposal of data regarding their members, coordinators do not collect data in a regular and systematic manner.

(6) Many clusters do not have websites.

(7) In the population of potential clusters also structures that have an opportunity (in a medium term perspective) to transform into clusters of full value are identified. In case of others, it would require a significant engagement of coordinators, willingness to cooperate on the part of members, as well as support.

The basic aims for clustering in Poland for 2020 [15] have been indicated, among others: increasing external networking of clusters, reinforcing integrated planning processes, increasing the number of

innovative products and services, reinforcing private investments in clusters and increasing foreign investment inflow, increasing private inputs to the research and innovative activity, development of cluster environment institutions (education, research entities, academic parks and innovation and technology centres), increasing effectiveness of using public inputs.

It has been stated that in the view of stipulated directions of clusters' development, effects concerning various spheres of clusters' functioning are expected. Predominantly, the following will be improved: hitherto methods of economic cooperation, creating innovation, cooperation with the authorities and more beneficial conditions for lobbying to the benefit of clusters will be created. Developing a network of interpersonal communication will have a positive impact on relations with companies and different institutions. The access to specialist trainings will increase and the educational system in the region will begin to adjust to the needs of a cluster, in particular, of the one leading in a given area. Therefore, one can state that the vision for Polish clustering until 2020 is very optimistic.

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