

CHARACTERISTICS OF CLUSTERS IN LOGISTICS SECTOR IN POLAND AGAINST THE BACKGROUND OF OTHER CLUSTERS

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Abstract

The main purpose of the paper is identification and presentation of the main features of clusters in logistics sector in Poland. Industrial clusters play important role in the development of regional and national economies. For the analysis the data from nationwide analysis of cluster in Poland carried out in 2015 was utilized. The information about logistics clusters were updated in 2018. On the base of this information comparative analysis between logistics clusters and clusters in other sectors in Poland was carried out. Based on these studies we can observe that the basic motivation for cooperation in clusters is to undertake joint projects and implement innovations. The activities of logistics clusters in Poland were compared with the activities of selected european clusters.

Keywords: Industrial clusters, logistics sector, innovation, cooperation

1. INTRODUCTION

In every sector of the economy we can observe cooperation between business entitles and other organizations. The concept of cluster developed by Porter [1] is embedded in the Marshalian concept of industrial district [2]. Cluster can be defined as "... a group of subjects from different backgrounds: business, science, self-government and civil society, operating in a specific ecosystem, focused on a specific territory and / or around a specific specialization. The synergy effect is achieved through formal and informal relation-ships, shaped by the cluster's potential and social capital, which not only describe the way in which the cluster operates, but also emerge and develop on the basis of joint ventures (including innovations), knowledge exchange and competence development" [3,4].

The genesis of clusters and networks research presented in the paper should be seen in 2004 by the first attempt of identification of regional networks in Śląskie region, Poland. The scientific team at the Faculty of Organization and Management carried out practical analysis as the foundation of establishing regional clusters. In 2015 the analysis of all clusters in Poland were carried out for Polish Agency for Enterprise Development (PARP) [5]. On the base of these research the authors updated information about logistics clusters at the end of 2018.

The essence of proposed approach presented in the paper was included in the answers for the following research questions:

- 1) What is the characteristics of clusters in logistics sector in comparison of other clusters existing in Poland?
- 2) What is the role of cluster in logistics sector in Poland considering their activities for cluster members?

Clusters in logistics sector and their role were analyzed by Przybylska [6]. The author identifies the role of clusters as the way of implementing innovation in enterprises - cluster members. Kruczek and Żebrucki have analysed logistics cluster in Europe and Poland identifying 4 clusters in Europe and 2 logistics clusters in Poland. The authors argue that logistics clusters by establishing cooperation between businesses can offer new complex services for their clients [7]. On the base of presented examples, the role of cluster on the global market was identified. Logistics clusters that are communities of organizations that share logistics expertise

and know-how, have become key links in global supply chains and can be found in almost every region of the world. The authors also argue that development of logistic clusters in Europe and in Poland is still not satisfying and can be combined with the initial phase of those development. In 2008 the EU Commission support the thesis that Europe needs better clusters than more clusters - it is crucial for the development based on cooperation [8].

Among the examples of global logistics clusters we can find the cluster with transnational cooperation - United Nations logistics cluster resolving the challenges of disaster relief management and humanitarian logistics [9]. This cluster implements contemporary logistics solutions but for social rather than business purposes.

Analysis of literature devoted to clusters allows for drawing conclusions that this term is characterized by great capacity and semantic ambiguity. An attempt to understand the essence of a cluster necessitates the synthesis of approaches that within past 100 years have developed a few key cluster definition concepts. Studies of Gordon and McCann [10], Iammarino and McCann [11] as well as Knop [3,4] allow to summarize the cluster definitions:

- Cluster as a classic agglomeration related to industry concentration, where administration as well local and regional authorities play significant role.
- Cluster as an industrial complex that focuses companies within a specified space and concentrates on concrete (specific) relationships within the scope of sales and procurement of companies that strive to lower transaction costs and improve competitiveness.
- Cluster as a social network, i.e. "club" focused on social bonds and trust that facilitate cooperation and innovativeness; underline activity of various organizations with particular emphasis on civil society.
- Cluster as a knowledge hub based on cooperation of scientific and research entities with business in order to create new knowledge and revolutionary innovations. Critical determinants of clusters are: knowledge management within a cluster, cluster value, configuration of resources in a cluster.

Current development of cluster concept points to domination of cluster understanding as concentrations on a specified territory, understood from the perspective of regional specializations. Porter noticed that cluster feature is the fact that it represents an original and efficient organizational form and its improved effectiveness reveals on three ways: improvement of effectiveness of companies belonging to it; increase of innovation capabilities of companies; encouragement to create new economic entities.

Clusters in logistics sector are linked with the clusters existing in other sectors, especially in production [12] or metal manufacturing [13] but also aviation industry, automotive and business services [14].

2. CLUSTERS IN POLAND AND CLUSTERS IN LOGISTICS SECTOR - CHARACTERISTICS

2.1. Methodology

To collect the data about cluster characteristics the web interview was implemented. The data about cluster were collected in 2015 and updated in 2018. For updating information about logistics clusters in 2018, the direct interviews with cluster coordinator were used. At the turn of 2016 / 2017, one made attempts related to take stock of Polish clusters and then, at the beginning of 2018, they were verified. The first analysis was prepared based on the order of the Polish Agency for Enterprise Development. The purpose of the work was primarily the verification of the list of over 800 clusters that were recorded among other things: in European, national and regional databases, supplemented by the expert opinions and the interested clusters themselves. Based on this, it is possible to present development of logistics sector clusters.

2.2. Findings - clusters in Poland

Figure 1 presents the existing sectoral specializations of clusters in Poland: ICT is the dominating sector because of type of network innovations existing in this sector. There are 5 cluster operating directly in logistics



sector, moreover 3 clusters representing shipbuilding and marine industry. As we can observe in **Table 1** presently there are 5 active logistics clusters for the number of 214 total number of clusters in Poland. **Figure 2** presents the dynamics of the cluster creation process in Poland, while **Figure 3** the number of clusters with a specified number of members.

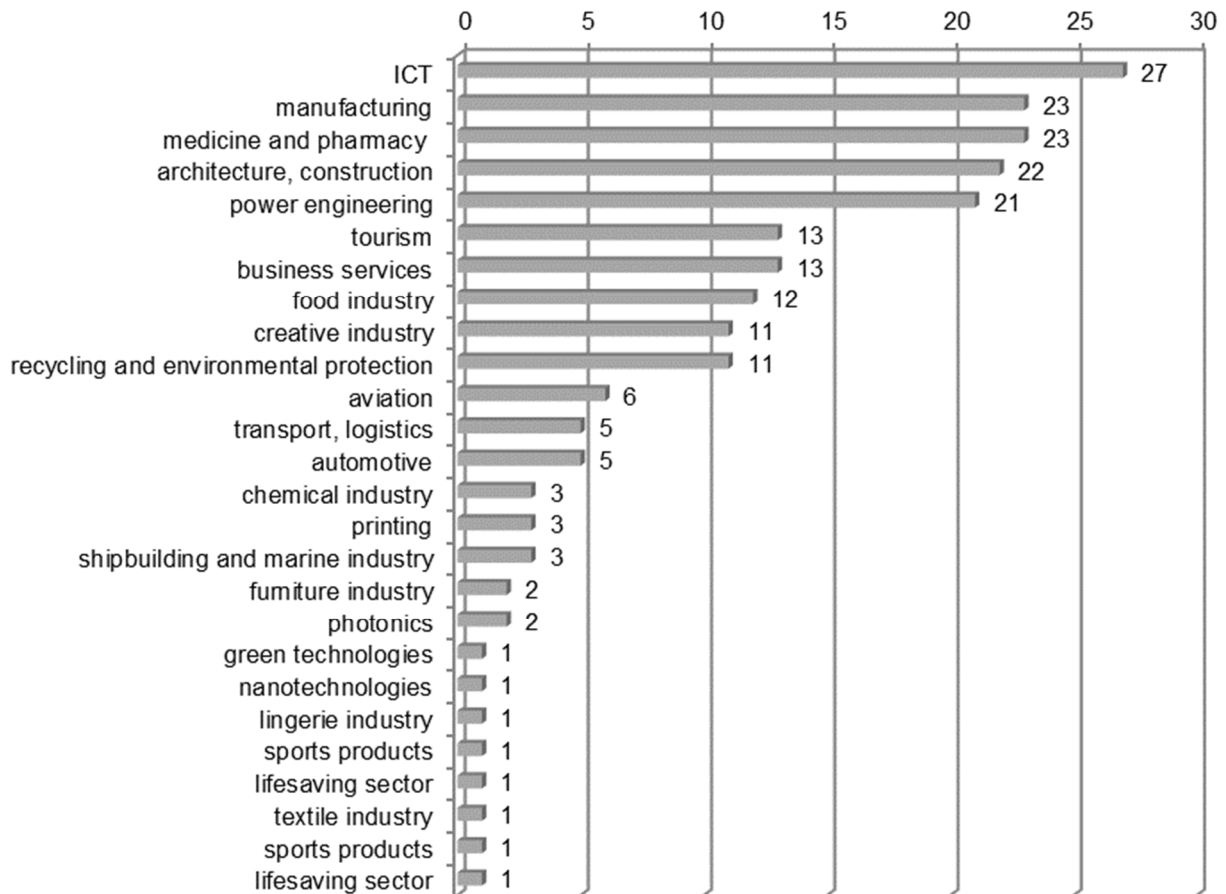


Figure 1 Sectoral specializations of clusters in Poland (n = 214) [own elaboration based on inventory results]

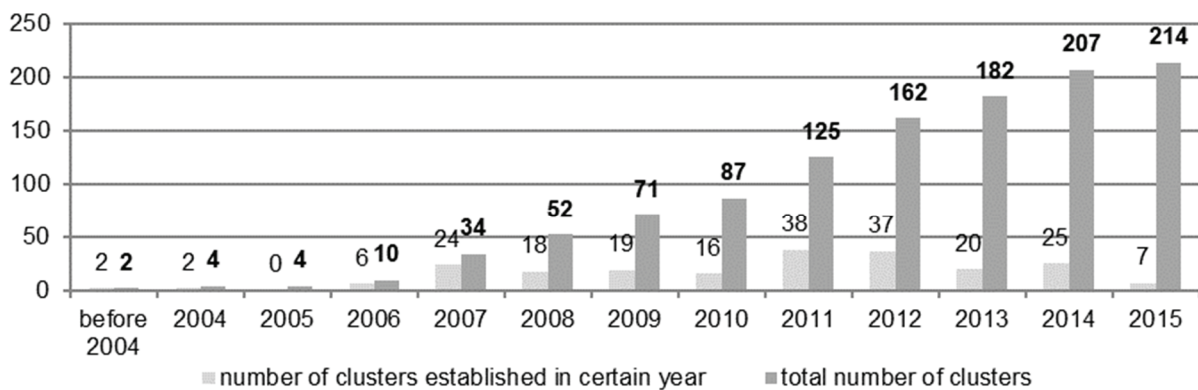


Figure 2 The number of clusters created in Poland 2004 - 2015 [own elaboration]

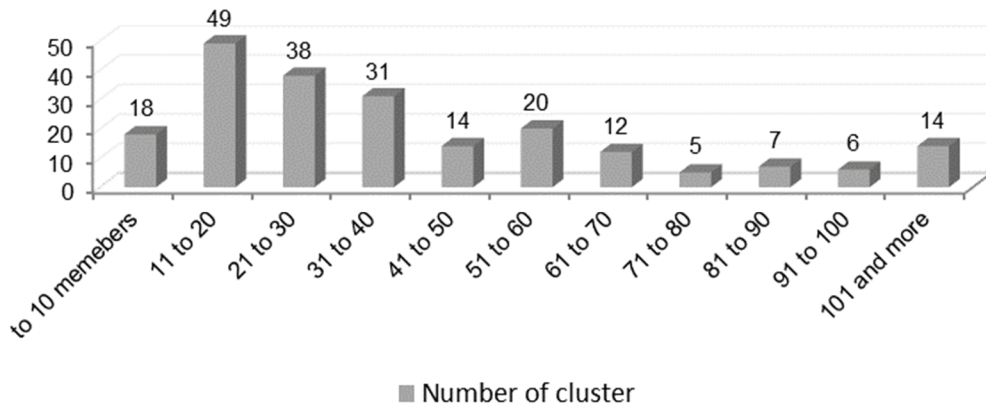


Figure 3 The number of clusters with a specified number of members (n = 214) [own elaboration]

A large number of small clusters in Poland owes its origins to cluster policy, which has supported small consortium projects. Taking action for a large number of members is both cumbersome and due to the complexity of action network in a cluster, highly labor-intensive. Only some clusters in their strategy take the risk of increasing the number of members, in spite of the conditions being created. We must also be aware of the fact that, even in relatively large clusters (i.e. more than 50 members), the exchange of functional knowledge useful for entrepreneurs is limited to several entities.

According to the premises behind the concept of triple helix innovative environments, including clusters, should integrate representatives from three backgrounds: business, science and administration. **Figure 4** shows the structure of entities in clusters on a sample of clusters with validated data. It is an overall structure of entities, that is, taking into account the number of all entities declared by the clusters. As expected, the largest group are enterprises (more than ¾ of entities are enterprises). Among enterprises the largest group are microenterprises (37 %), then small enterprises (21 %), medium-sized enterprises (14 %) and large companies (6 %). Business environment institutions constitute 5 % of the structure of the entities, scientific units are 9 %, and other entities 8 %. It should be noted that there may have been situations in which the same scientific units are present in several clusters, which is quite common among large scientific units, whereas very rare in the case of enterprises.

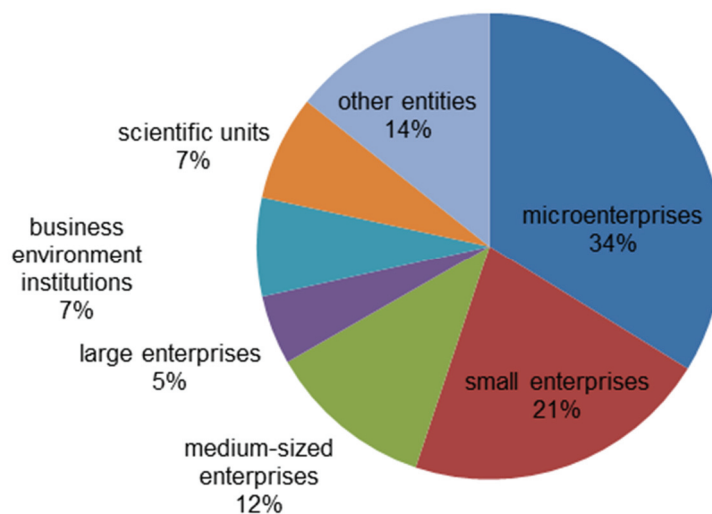


Figure 4 The structure of entities in a sample of clusters (n = 214) [own elaboration]



2.3. Findings - logistics clusters in Poland

On the background of the information about clusters in Poland we can observe the characteristics of clusters operating in logistics sector. These clusters operate in logistics services of transportation but also represents the variety services forming the maritime sector. The characteristics of these clusters is presented in **Table 1**.

Table 1 Characteristics of the logistics clusters in Poland [own elaboration]

No.	Name	Year of establishment	Legal form of the coordinator	Legal form of the cluster	Number of affiliated entities	Employment in the cluster members
1	Baltic sea & space cluster	2009	University	Agreement	65	14 thousands
2	„North-South” Logistics & Transport Cluster	2012	Limited liability company	Agreement	48	n.d.
3	„North-South” Logistics & Transport Cluster	2012	Limited liability company	Agreement	48	n.d.
4	Southern Railway Cluster	2012	Asociacion	Asociacion	55	2.5 thousand
5	Silesian Logistics Cluster - inactive	2012	Joint-stock company	Agreement	21	n.d.
6	Cross-border Cluster "Waterway Berlin - Szczecin - The Baltic See"	2008	Asociacion	Agreement	38	n.d.
	Maritime Cluster of Western Pomerania	2011	Joint-stock company	Agreement	30	n.d.

3. CONCLUSION

Cooperation is the future of the interorganizational relations covering the transfer of products but also transfer of knowledge and innovations. The dynamic start of cluster development in Poland can be dated to 2004, yet most of them were created in the years 2011 - 2015. The number and specializations of clusters and the number and structure of entities provides us with basic data on clusters in Poland. The PAED inventory of clusters in 2015 enabled the cluster population to be determined, the number and characteristics of which are derived from the quantity and quality of the information obtained. Similar situation can be observed also in logistics clusters:

- 1) Logistics clusters are similar to other clusters in Poland in terms of size, organizational forms and undertaken activities.
- 2) Clusters operating in logistic sector do not resolve directly the main logistics challenges appearing on global markets - cutting transportation costs. This challenge is resolved by implementing innovation in logistics sector and by the benefits of sectoral cooperation.
- 3) In comparison to other clusters, we can observe less activity in implementing technological innovations of logistics clusters in Poland.

- 4) Clusters seem to be interesting form of cooperation in case of implementation of innovations, however according to present European policy we can expect decreasing number of clusters. From 2004 the number of clusters in Poland increased. In last three years it is stable - there are no new cluster initiatives. In the future we probably might observe decrease number of cluster with the expectation that only good clusters remain - also in logistics sector.

ACKNOWLEDGEMENTS

The paper presents selected results of the research project entitled “A network of regional specialist observatories in the process of entrepreneurial discovery” project number WND-RPSL.01.03.00-24-06A2/16-005, Task 7: Observatory in the area production and processing of materials.

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