Analysis of the Functioning of Clusters in Poland

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	ABSTRACT
<p>2021 Research Leap/Inovatus Services Ltd. All rights reserved.</p> <p>DOI: 10.18775/jibrm.1849-8558.2015.71.3004 URL: http://dx.doi.org/10.18775/jibrm.1849-8558.2015.71.3004</p>	<p>The cluster concept has gained special significance after the publication of the works of M. Porter "The Competitive Advantage of Nations"(1990). But the most popular definition of industrial cluster was formed eight years later, when he wrote that clusters are: "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (e.g. universities, standards agencies, trade associations) in a particular field that compete but also cooperate"(Porter, 1998, p. 197). A cluster as a regionally focused form of economic activity generates positive effects for business and the region. Global researchers suggest that clusters help to increase the innovation and competitiveness of the country in which they are located. Since the 90s clusters have become an increasingly important element of economic development and innovation strategy of the European Union and its Member States. In years 2007–2013, clusters are expected to one of the objectives of support for EU regional policy. EU funds destined for cluster initiatives will help to take concrete actions by entrepreneurs interested in the cluster activity. Poland has recently joined the countries interested in popularizing the idea of clusters. Some specialized cluster studies have been carried out in Poland identifying clusters. This article gives an overview on policy support, formation and the functioning of clusters in Poland.</p>
<p>Keywords: Cluster, Cluster policy, Initiatives, Poland.</p>	

1. Introduction

The ability to compete in the national market and the flexibility of enterprises are becoming increasingly important in the face of the world economy. One way to strengthen the competitive position of companies is by exploitation of synergies resulting from the cooperation between enterprises in clusters.

Since 2000 there has been increased interest in Poland and cluster structures associated with such situations as:

- finding new solutions to improve the innovativeness of enterprises,
- preparations for Poland to join the European Union,
- development of information technology,
- Polish participation in the activities of various international organizations,
- striving enterprises to improve upon their competitiveness and increase innovation.

Poland ranks low in terms of competitiveness and innovation among international rankings. In the report Innovation Union Scoreboard 2011², Poland had been placed for "moderate innovative countries – catching up economies" (European Innovation Scoreboard 2011, p. 27), because our ranked performance indicators which have been taken into account in

this study had below average. The average Summary Innovation Index for UE-27 countries was 0.533 but for Poland economy it was 0.304 in 2010 (chart 1).

The report said that in Poland we are relatively strong human resources, finances and support, firm investments. But level is still low in: innovative small and medium-sized enterprises, cooperation among businesses, level of entrepreneurship, and the amount of funding provided for research and development. Expenditures on research and development activity in Poland in 2010 were at the level of 0.68% of gross domestic products, but the average EU-27 countries level at was 2.01% of gross domestic products. On the other hand at the same time gross domestic products according to purchasing power parity per capita in PPS (current prices) was at 15300 €, but the average among the 27 countries EU was at 24 400 € (Statistical Yearbook of the Republic of Poland, 2011, p. 749–752).

Chart 1: Convergence in innovation performance in EU-27
(www.proinno-europe.eu/metrics)

Poland ranked 39th among 139 countries in the Global Competitiveness Report 2010–2011, which was drawn up by the World Economic Forum. This is a good result when compared against the world at large, but not outstanding among European countries. From 2003 on, we had successively moved up and proven our position. The following European country scored higher competitive positions than Poland: Sweden (2th), Germany (5th), Finland (7th), Netherlands (8th), Denmark (9th), United Kingdom (12th), France (15th), Austria (18th), Belgium (19th), Luxemburg (20th), Ireland (29th), Estonia (33th), Czech Republic (36th) (The Global Competitiveness Report 2010–2011, p. 25). The report emphasized the poor technical infrastructure in Poland, the low degree of cooperation between the public and private sectors as well as of research and development, and business environment institution quality (chart 2). The authors suggest that Poland should now focus its efforts on creating conditions for the development of entrepreneurship and innovation. Therefore the development of an appropriate policy taking into account the cluster is of special importance. Policies conducive to the development of clusters and, - enterprises can help improve the innovative and competitive position of the Polish economy within EU countries and worldwide.

Chart 2: Relative performance of Poland with other countries
(based on The Global Competitiveness Report 2010–2011, 2010)

2. How We Support Clusters in Poland?

In Poland there are neither separate policies based on specific clusters nor overall cluster policies in effect. Clusters are part of regional innovation policies and economic policy. Projects involving clusters appeared sporadically between the years 1994–1999. However, in during the 2000–2006 period, projects supporting cluster initiatives were as follows: Action

2.6 Integrated Regional Operational Programme, Measure 2.3. Sectoral Operational Programme Human Resources Development, Measure 1.3. and 1.4 Sectoral Operational Programme Improvement of the Competitiveness of Enterprises. These activities accounted for only 5.4% of Community measures identified in the Community Support. It

is during this period when projects, typically financed to the development of human resources for the modern economy and innovative enterprises. Organizations related to the promotion of cluster development in Poland are now: the Ministry of Economy, Ministry of Regional Development and Ministry of Science and Higher Education and the Polish Agency for Enterprise Development. The interest in support of cluster structures and their development increased in for years 2007–2013. The need to support the cluster was included in the nationwide operational programs and regional operational programs of individual Polish voivodships. The document "Strategy for increasing the innovativeness of the Polish economy in 2007–2013", emphasizes the importance of a cluster in a supportive role for enterprises to

improve upon their innovation. In the National Regional Development Strategy for 2007–2013 emphasis is placed on promoting cooperative ties among enterprises, popularizing the knowledge of the clustering, deepening of cooperation among public and private sectors and business environment (Poland National Strategic Reference Framework (NSRF) for 2007–2013, 2006, p. 37). It should be noted that those documents contain only general information on cluster, their problems and possible solution. The Poland NSRF for purposes directly related to support clusters allocated approximately 116 million euro (104.3 million in the Operational Programme Innovative Economy, and 11.8 million Operational Programme Development of Eastern Poland).

For the years 2007–2013 the following sources of financing for emerging cluster initiatives and development of existing clusters are available in Poland (www.biznesklaster.pl):

- Operational Programme Innovative Economy, Measure 5.1 "Supporting cooperative relations on a supra-regional importance." It supports initiatives that lead to cooperation and strengthening the links between economic and scientific organizations representing at least two regions.
 - Operational Programme Human Capital, , Measure 2.1 "Development of modern economy" (Sub-measure 2.1.1 "Development of human capital in enterprises", Sub-measure 2.1.2 "Partnership for increasing adaptability", Measure 2.1.3, "System support for increased adaptability of workers and enterprises
 - Operational Programme Development of Eastern Poland (this program is dedicated for five regions: Lubelskie, Podlaskie, Podkarpackie, Świętokrzyskie, Warmińsko-mazurskie), Measure 1.4 "Promotion and Cooperation", component "Cooperation" - co-financing projects related to building networks, including those related to the identification and development of clusters;
 - Regional Operational Programmes
 - Seventh Framework Programme, which is the EU's financial instrument supporting research and development, encompassing almost all scientific disciplines.
- Different approaches to support clusters are being applied at the Polish regional level. Some Polish regions (Świętokrzyskie, Mazowieckie, Wielkopolskie, Warmińsko-mazurskie) directly point to the possibility of supporting formal clusters of structured funds (within the Regional Operational Programmes), and extracts for this purpose a separate action. Other regions (Podkarpackie, Podlaskie, Lubelskie, Małopolskie, Łódzkie, Dolnośląskie, Śląskie, Opolskie, Lubuskie, Kujawsko-pomorskie, Pomorskie) connect clusters of activities that support other efforts to promote entrepreneurship,

business environment and build relationships between businesses sharing the sphere research and development. In the case of one region does not explicitly mentioned the possibility of supporting cluster initiatives and cluster. Pomorskie region alone has developed and implemented the "Regional Cluster Support Program for 2009–2015". This program aims to support three types of clusters (key, sub-regional/local and embryonic/network technology). Two other Polish regions (Dolnośląskie, Wielkopolskie) - launched an official program to support clusters based on relatively small internal resources. We see that only some regions leaders are aware of the benefits of the development of cluster structures, and therefore offer them support. Some regions have participated or currently participate as partners in international projects Regionet, CluStart "Boosting innovation through new cluster concepts in support of emerging issues and Cross-Sectoral themes". Projects are aimed at increasing the knowledge and expertise in support of clusters, both among local governments, and regional institutions for regional development. Those projects also served to develop international cooperation among clusters of the region (Directions and assumptions of Polish cluster policy until 2020..., 2012, pp. 26–27).

Despite the various cluster support programs there is a need to form a national policy of cluster development, taking into account regional differences during the process of their formation. Equally important activities were carried out to promote the idea of clustering within each region. A impediment to the development of clusters in Poland are the regulations that should facilitate cooperation between public and private sectors. Financial aid from EU funds is just one of many elements to support a cluster. Mutual trust between companies and a desire to start a business cooperation are also essential factor. The Public Opinion Research Centre shows the level of public confidence in Poland to be low. Their research from March 2010 shows that 96% of Poles trust family, friends (90%), relatives (87%), colleagues (84%), and - to a lesser extent - neighbors (74%), and the parish pastor (69%). 46% of respondents did not trust strangers (The Public Opinion Research, 2010). Low public confidence affects the quality of cooperation between enterprises within clusters.

3. Formation and Functioning Clusters in Poland

Operation of enterprises in the clusters is a new form of spatial organization of production processes in Poland. In the 90's the first study of regional innovation systems, which concerned industry associations with science was carried out. In 2002, the Institute for Market Economics in Poland was the first to conduct a study identifying the presence of clusters in the economy. Similarly, by 2007 the Polish Agency for Enterprise Development had identified a cluster structure. Studies of clusters in Poland have been conducted for a relatively a short time. So there has been no comprehensive study of clusters, apart from a few fragmented studies of clusters in Poland. Some information on the number of identified clusters in Poland can be found in the European Cluster Observatory (www.clusterobservatory.eu). According The Observatory there are 246 clusters in Poland. More detailed information about clusters in Poland is provided by a report „Cluster benchmarking in Poland”, which was prepared by Polish Agency for Enterprise Development (PAED) in 2010. The authors showed that between the years 1997 and 2009 in Poland there were 178 cluster initiatives. However 47 of them were

selected to take part in this research, because only those have been classified as a cluster and it was possible to establish contact with them (Cluster benchmarking in Poland, 2010). A high concentration of specialized business in an area or related industries does not necessarily imply that there is cooperation between enterprises, which is the basis of the cluster. I can vouch that the report of PAED illustrates in a good way the reality of creating and functioning of the Polish clusters.

The best known example of a high technology cluster in Poland is The Aviation Valley Association. It was created in 2003, as a non-profit organization, to provide a means of rapid development and growth of the aerospace industry in southeastern Poland. This historic decision was made by a group of leading aeronautic producers, suppliers and businessmen. Significant funding for the Association has been provided by Pratt & Whitney, a world leader in the design, manufacture and service of aircraft engines, space propulsion systems and industrial gas turbines. Now it represents 90 companies within the region, with several others in the process of applying for membership (www.dolinalotnicza.pl). Other known clusters in Poland are: The Tarnow Industrial Cluster Plastic Valley, Ceramic Tiles in Opoczno, Amber in the Gdansk, Automotive Parts Manufacturers' Association and Organic Food Valley.

In Poland 47% of the studied clusters were established in 2007, which is related to the availability of European programs aimed at promoting clusters, described earlier. 36 % of clusters were established as a result of undertaken activities (Cluster benchmarking..., 2010, p. 31).

The main creators of the clusters were entrepreneurs themselves who saw the benefits of cooperation. Clusters were also formed through the initiatives of businesses supporting institutions as well as research and development sectors. These clusters have 1886 members. 78% of members of clusters is business, 8% of business supporting institutions (for example: industry associations, chambers of commerce, Centre for Innovation and Transfer of Technology, non-profit consulting institutions and agencies for ownership transformations or restructuring agencies), 8% of research and development sectors, 6% of other members (which include local government units).

Chart 3: Members of clusters (Cluster benchmarking in Poland: survey report in 2010, 2010, p. 31)

Chart 4 presents the size of enterprise which are part of the clusters surveyed. 44% of clusters in Poland consist of microenterprises, which employ up to 9 people. Clusters in

Poland are a good way of developing small and medium enterprises. One cluster in this group consists of microenterprises; others clusters consist of different-sized enterprises.

Chart 4: Structure of business in clusters (Cluster benchmarking in Poland: survey report in 2010, 2010, p. 31)

43% of cluster initiatives participating in the benchmarking operates on an association and 11% of signed consortium agreements. Other clusters operate in the form of: joint-stock companies, companies with limited liability, foundations, agreements, associations partnership agreements, contracts of cooperation and economic chambers.

32% of clusters function in highly innovative industries such as computer science and aviation. 40% of the clusters represent intermediate level of development industries (hospitality and tourism). Clusters in Poland have limited financial resources to carry out their tasks. Two years prior to the research, 43% of respondents did not have any outside financial resources. 28% of clusters had a budget of under 500 thousand PLN. 24% of clusters have more than one million PLN for development of the cluster. Clusters have problems with financing their projects from their own resources alone. The studied clusters initially gained from EU 65,5 million PLN worth of funds and they carried out 62 projects. These projects focused on financing infrastructure, including construction and manufacturing lines. 63% of clusters allocated less than 10% of their budget on research and development. 28% didn't conduct any on research and development at all. Two clusters spent an average of 80% of their budget on research which did not result in the form of patent protection. One cluster, despite having 20% of the budget appropriated, developed five innovative solutions, and received a patent for them (Cluster benchmarking..., 2010, p. 46).

Members of the cluster share with each other some forms of cooperation (see chart 3). Almost all clusters (47 clusters) have their own website, where we can find contact details and information about the members of the cluster. One cluster has no website, because it has no money for its upkeep. 98% of clusters conduct joint activities in the field of advertising. 10% of clusters are not organized nor participate in any fairs or exhibition. 58% of clusters organized social events for members once or several times a year. Such events enable their members to seek opportunities cooperation to in an informal way. 56% of clusters see the need to cope for cooperation with public authorities in order to consolidate their position in the market (Cluster benchmarking..., 2010, pp. 82–89). Cluster

activities are mainly aimed at local government where the clusters operate.

Chart 5: Types of activities undertaken by the studied clusters (http://www.pi.gov.pl/eng/chapter_86525.asp)

53% of the cluster conducts one single form of education for members of its cluster. They create activities such as workshops, visits to foreign clusters and conferences. Clusters are interested in raising the level of expertise among their members. The analysis shows that the clusters that have received external funds applied several measures to increase the level of knowledge.

42% of clusters share a database, which usually contains contact details of their members and partners. 11% of clusters recognized that such a database is important. 40% of clusters have communication frameworks, where they have discussion forums and groups. Only 17% of clusters share work on new products and services. 35% of clusters are considering such a cooperation. 14% of clusters share distribution channels. Flow of information and diffusion of innovation is limited. It is notable that the transfer of knowledge and innovation make operating business in clusters highly innovative.

The total employment in companies of all clusters in Poland is around 284 000 people (Cluster benchmarking ..., 2010, p. 124) which accounts for 1.6% of employees in the economy. By comparison, the proportion of employees in clusters distinguished by the ECO is about 15.5%, whereas the average for the European Union (EU-27) is 20.7% (Directions and assumptions of Polish cluster policy until 2020, 2012, p. 18). It can be concluded that cluster have a limited influence on the labor market in Poland.

The clusters comprise of approximately 42 entities, which on the average employ about 5,800 employees. In clusters involved in highly innovative research contracts with the industry, an average of 20 employees are involved. Clusters tend to employ highly qualified professionals (averaging 50% of employees) (Cluster benchmarking..., 2010, pp. 56–57).

4. Conclusion

In Poland there are no specialized tools for developing policies based on clusters. It is therefore necessary to develop suitable policies to support a cluster model which takes into account the evolving conditions. A cluster is a difficult tool to stimulate growth, as it requires the formation of human capital at a high level. Local governments should in the right way support the development of human capital and seek to incur level of trust in society which will improve the cooperation between enterprises.

It is also important to create the proper conditions for clusters, whence not enough aid is distributed to entrepreneurs interested in this form of business organization, if there is adequate infrastructure and legal basis. In addition, cooperation between research centers and the private sector should be strengthened because a competitive and innovative economy is the "cooperating" economy.

Clusters in Poland are a relatively recent phenomenon compared to the traditions of European clusters and Silicon Valley. Clusters which have participated in the study are in the early stages of development. At this stage, clusters need promotion, financial and legal support and business consulting. Clusters have some difficulties with financing the activities using solely their internally funds. Projects and activities are used by clusters which have received external funding.

Members are unwillingly to cooperate with each other. They do not exchange the information about their technology for fear of competitive advantage - this is a result of low levels of trust in Poland. Low level of cooperation between members of clusters as well as low of funding for research and development are the cause of lead to a low level of innovation and technology exchange among clusters.

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