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BENCHMARKING OF CLUSTERS IN POLAND. THE CONCEPT, METHODOLOGY, APPLICATION ASPECTS AND RESULTS

Introduction

The concept of clusters has a long tradition, dating back to A. Marshall's[93] idea of industrial districts, developed further by many scholars and researchers, concentrating on the issues of local production systems[94], innovative *milieux*[95] and many others. Although clusters stand for popular intellectual conception among regional economists and their support is also becoming an important tool of regional and industrial policy in European countries, there are still many research gaps in this field. Therefore, a benchmarking study aiming at identifying of the activity of clusters has been conducted in Poland recently. Among many results, valuable from both a theoretical and a practical point of view, one has noticed that the success of Polish clusters depends greatly on the quality of the regional environment in which they operate. The aim of this paper is to present the methodology and main outcomes of the first complex benchmarking project of clusters in Poland. It consists of four parts. First, benchmarking is defined as a more and more popular tool of enhancing an organization's excellence, not only in business but also in public or political spheres. The second part of the article is devoted to the presentation of the methodology of the first Polish benchmarking project, proposed and implemented by the authors. This methodology is, nomen omen, benchmarked to similar projects conducted in EU. The third part presents the most interesting results of benchmarking of Polish clusters while the fourth part concludes the paper.

Benchmarking as a tool of enhancing clusters excellence

Over the last years, benchmarking has gained significant importance as a method of performance evaluation as well as an improvement in the functioning of various types of organizations. It is treated as a part of a group of so called "soft" methods of management change. The origin of the term "benchmarking" can be derived from the word "benchmark", which means the starting point, a reference point, a landmark or object constituting a base for comparison.[96] The American Productivity and Quality Center (APQC) defines "benchmark" as the best possible achievement, regarded as the reference point of excellence for the business process.[97]

Benchmarking can be interpreted as a continuous process of measuring products, services and procedures in relation to the strongest competitors or those companies that are considered to be

[92] Contacts olanow@uni.lodz.pl, sokol@uni.lodz.pl, zbycho@uni.lodz.pl

[93] A. Marshall, *Principles of Economics*, Macmillan, London 1920

[94] See, for example: A. J. Scott, M. Storper, *Regions, Globalization, Development*, Regional Studies, vol. 37, 6&7, 2003, pp. 579-593; M. Storper, *The Regional World: Territorial Development in a Global Economy*, Guilford Press, New York 1997; G. Becattini, E. Rullani, *Sistema locale e mercato globale*, "Economia e Politica Industriale" vol. 80, 1993, pp. 25-40; P. Cooke, K. Morgan, *The Associational Economy: Firms, Regions and Innovation*, Oxford University Press, Oxford 1998; M. Bellandi, *Italian Industrial Districts: an Industrial Economics Interpretation*, "European Planning Studies" 10 (4), 2002, pp. 425-437; M. Piore, C. Sabel, *The Second Industrial Divide: Possibilities for Prosperity*, Basic Books, New York, 1984

[95] Ph. Aydalot, *Milieux Innovateurs en Europe*, Groupe de Recherche Europden sur les Milieux Innovateurs, Paris 1986

[96] P. H. Collin, J. Słupski, *Słownik Biznesu*, Peter Collin Publishing, Warsaw 2000

[97] Based on: A. Węgrzyn, *Benchmarking. Nowoczesna metoda doskonalenia przedsiębiorstwa*, Oficyna Wydawnicza Antykwa, Kluczbork - Wrocław 2000

industry leaders.[98] D. Kearns, a former CEO of Xerox, precursor of this method in business management, defines benchmarking as a continuous process of measuring products, services and practices against the strongest competitors or those recognized as industry leaders.[99] In other words, it is the process of improving the efficiency of the organization by identifying, analyzing, adapting and implementing the solutions used by the most efficient organizations in the world.[100] It is a process of continuous learning and creative improvement, which is based on using the solutions that were formerly developed by the best in their field. What is really emphasized in the benchmarking process, is its continuity and the regularity of it, with the concentration on measuring, comparing products, processes and results. The classical approach consists of four basic elements: 1. the identification of the subject of benchmarking, 2. data analysis, then 3. designing changes and 4. implementing better solutions.[101]

Since the beginning of the 1980's, one can observe a growing attention devoted to benchmarking, but after the nineties one can talk about a real explosion of this interest. As a consequence, benchmarking is nowadays used also for non-commercial activities, such as the benchmarking of cities and regions[102], technology and science parks[103], but also: airports[104], universities[105], energy suppliers[106] or health care organizations.[107] In European Union countries, benchmarking is also used for the evaluation of more complex economic structures, such as regional innovation systems, or whole public services' systems.

Not surprisingly, in recent years this tool has become a popular instrument for improving the operation of clusters[108] and increasing the efficiency of cluster policy in the EU countries. However, in practice one can observe a rich variety of criteria and methods of cluster benchmarking. Clusters are a difficult subject and the area for this type of analysis, and what is more, in literature and practice, there is no universal and widely accepted methodology for cluster benchmarking. The basic aim of doing cluster

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[98] I. J. Dahlgaard, K. Kristensen, G. K. Kanji, *Podstawy zarządzania jakością*, PWN, Warsaw 2002

[99] A. P. Sage, W. B. Rouse (Eds.), *Handbook of Systems Engineering and Management*, John Wiley and Sons, 1999, p. 341

[100] J. Brilman, *Nowoczesne koncepcje i metody zarządzania*, PWE, Warszawa 2002

[101] PARP, *Europejska procedura benchmarkingowa. Programy i działania*, Polish Agency for Enterprise Development Press, Warszaw 2007, pp. 18-22

[102] http://www.europeancitiesmarketing.com/listing.asp?cat=6&id=96, accessed 21.04.2011; P. Rondo-Brovetto, I. Saliterer, *Comparing Regions, Cities, and Communities: Local Government Benchmarking as an Instrument for Improving Performance and Competitiveness*, "The Innovation Journal: The Public Sector Innovation Journal", 12(3), 2007

[103] B. Kowalak, *Benchmarking Parków Technologicznych w Polsce. Raport*, Polish Agency for Enterprise Development, Warsaw 2010

[104] e. g. *Report on the Effectiveness of International Airports*, The ATRS report has been prepared by 13 leading scientists from Asia, Europe, North America and Australia and edited by professor Tae H. Oum of Sauder School of Business, University of British Columbia in Vancouver, Canada (Deloitte, *Cluster Benchmarking in Poland – 2010 Survey report*, Polish Agency for Enterprise Development, Warsaw 2010, p. 17; (http://www.parp.gov.pl/files/74/81/380/9762.pdf, accessed 21.04.2011).

[105] J. Woźnicki, *Benchmarking w systemie szkolnictwa wyższego*, Fundacja Rektorów Polskich, Warsaw 2008 (http://www.frp.org.pl/publikacje/FRPBench.pdf, accessed 21.04.2011).

[106] Deloitte, *Polski sektor energetyczny w świetle międzynarodowych standardów CSR*, Warsaw 2011 (http://www.deloitte.com/assets/Dcom-Poland/Local%20Assets/Documents/Raporty,%20badania,%20rankingi/pl_PolskiSektorEnergetyczny_a_CSR_2011.pdf, accessed 21.04.2011); *Energetyka cieplna w liczbach 2009*, Polish Energy Regulatory Office, Warsaw 2010 (http://www.google.pl/url?sa=t&source=web&cd=2&ved=0CB4QFjAB&url=http%3A%2F%2Fwww.ure.gov.pl%2Fdownload.php%3Fs%3D1%26id%3D3300&ei=aiKwTfLLEI_sOZWf7YEJ&usg=AFQjCNGNd6r6gFoKarwlYOjXOr3yeihWog, acessed 21.04.2011).

[107] B. Zięb icki, *Benchmarking w doskonaleniu organizacji usług użyteczności publicznej*, Monografie: Prace Doktorskie Nr 6, Wydawnictwo Akademii Ekonomicznej w Krakowie, Kraków 2007

[108] For the purposes of this paper we accept a broad definition of clusters by M. E. Porter: "Clusters are geographic concentrations of interconnected companies, specialized suppliers, services providers, firms in related industries, and associated institutions in particular fields, (…) linked by commonalities and complementarities" (M. E. Porter, *On Competition*, Harvard University Press, Boston 2008, pp. 213-214).

benchmarking is to provide these structures with useful tools for improving their operations, acquiring knowledge and learning. Another important aim is to show best practices identified among all entities being a subject of benchmarking. Moreover, analysis of this kind also contributes to identifying recommendations for cluster supporting policy (on both a regional and national level), as well as for other institutions supporting clusters (R&D entities, entrepreneurship and innovation supporting centers, etc.). However, in the end it is companies and cluster coordinators that are the direct and primary recipients of the results of cluster benchmarking.

Methodology of cluster benchmarking in Poland compared to similar European projects

The methodology proposed by the authors to the Polish Agency of Enterprise Development[109] is the result of adaptating the methods and experiences described below and appearing in different western European countries to local needs. The simple copying of these methods would not be a good solution because it would not take into account many factors specific to Poland, such as cultural, political and other institutional[110] differences, but also differences in stages of cluster development.
The first cluster benchmarking in Poland was built around the pursuance to collect data about the entire population of clusters in Poland on the one hand, and, on the other hand, to identify five pivotal axes of further analysis. The first part of benchmarking has helped to obtain the main cluster characteristics, like the sector of operation, management structure, region of origin, development type and stage, etc.). The second part of benchmarking was focused on comparing the state of cluster development in various spheres of their functioning and, consequently, finding the best clusters operating in Poland and showing their best practices and examples of operations.[111] In the key part of benchmarking, the analysis was structured as follows:

- Cluster resources
- Processes in the cluster
- Cluster performance
- Growth potential of the cluster
- Cluster strategy.

As a result, 5 core areas for benchmarking clusters, and within them, 18 specific sub-areas, were identified. The proposed benchmarking method examines both internal and external determinants of cluster functioning. In total, the proposed methodology is based on 89 indicators.

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[109] The authors of this paper are the creators of the methodology of the first cluster benchmarking in Poland, (conducted in 2010 under the auspices of the Polish Agency for Enterprise Development), as well as scientific consultants of this project. Detailed description of methodology, population of cluster being the subject of benchmarking as well its results, can be found in the general report at: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit.).

[110] It is worth recalling here the main thesis of institutional economy claiming that economic behavior is *embedded* in both economic and non-economic institutions defined as the restrictions established by the people for structuring these relationships. These institutions consist of both formal (such as a rules, laws, constitutions) and informal constraints (such as behaviors, conventions, beliefs) as well as rules for their implementation in practice (K. Polanyi, *L'économie comme procesus institutionnalisé*; [in:] K. Polanyi, C. Arensberg, K. Pearson (eds.), *Les Systèmes économiques dans l'histoire et la théorie*, Larousse, Paris 1957, p. 249; see also: B. Chavance, *L'économie institutionelle*, Editions La Découverte, Paris 2007, p. 39. In other words, institutions are rules of the game, referring to the popular definition by Douglas North (D. C. North, *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge 1997, p. 5). They are sets of common habits, routines, established practices, rules, or laws that regulate the relations and interactions between individuals, groups and organizations (C. Edquist, B. Johnson, *Institutions and Organizations in Systems of Innovation*, [in:] C. Edquist (ed.), Systems of Innovation: Technologies, Institutions and Organizations, Pinter/Cassell Academic, London and Washington 1997, p. 46). So defined, institutions depend on regional context and thus, differ regionally, definitely facilitating or constraining, cluster excellence.

[111] For more details see: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 20; based on: A. Nowakowska, Z. Przygodzki, M. Sokołowicz, J. Chądzyński, K. Matusiak, M. Klepka, *Benchmarking Klastrów, cz I. Opracowanie i opis metodyki benchmarkingu klastrów w Polsce*, Łódź 2008.

The proposed benchmarking method uses both quantitative and qualitative indicators but for clarity of analysis, in every core area, quantitative and qualitative indicators were separated. Thus, quantitative analysis was used to measure the cluster resources and cluster performance, while qualitative analysis was used to assess the processes occurring in the cluster, its growth potential and strategic orientation.

Table 1. Key areas and sub-areas in benchmarking of Polish clusters 2011

PART A	CLUSTER CHARACTERISTIC ASPECTS
Cluster characteristics	1. Basic data
	2. Sector of operation
	3. Cluster management structure
	4. Region of origination
	5. Development type
	6. Development stage
	7. Structure
	8. External projects carried out by the cluster
	9. Objectives
PART B	CLUSTER BENCHMARKING
Area I. Cluster resources (ratio scale)	I.1. Human resources and know-how
	I.2. Financial resources
	I.3. Infrastructural resources
Area II. Cluster processes (for each sub-point, score from 0 to 10)	II.1. Market activity
	II.2. Marketing and PR
	II.3. Internal communication
	II.4. Creating knowledge and innovation
Area III. Cluster performance (ratio scale)	III.1. HR development
	III.2. Improved competitive standing of the cluster
	III.3. Improved cluster innovation
	III.4. Internationalizing
Area IV. Cluster growth potential (for each sub-point, score from 0 to 10)	IV.1. Regional conditions
	IV.2. Public policy supporting cluster development
	IV.3. Associated institutions
	IV.4. Cluster leadership
Area V. Cluster strategy (for each sub-point, score from 0 to 10)	V.1. Economies of scale
	V.2. Creating knowledge and innovation network
	V.3. Impact on business environment

Source. Own composition

The basic tool for obtaining information for the benchmarking of clusters was a face-to-face, categorized interview. In order to provide high quality information, the interview was conducted among two main cluster actors, namely 1. the coordinator of the cluster and 2. The representative of the enterprise or other entity playing the role of the leader of the cluster. What is more, since conducting interviews requires considerable knowledge of both cluster functioning and methodology of doing interviews, a team of experienced "survey takers – experts", was engaged in the benchmarking project. Every expert had to certify a high level of knowledge and experience in both the theory and practice of clustering. This condition was also important in case of problems of

obtaining sufficient information (particularly missing numbers), since the role of experts was also an addition of missing data on the base of various secondary documents and desk research.

Finally, the study was supplemented by the analysis of secondary data sources as well as direct observation. Methodology also puts a strong emphasis on the clear visualization of research results, as well as deepening the conclusions of the diagnostic part of benchmarking. In other words, "survey takers – experts" were also responsible for identifying and selecting best practices, reviewed later by a panel of experts.

The proposed methodology, based on the triangulation ("cross examination") of research methods, data and investigators themselves[112], resulted in the reception of a wide range of standardized results on the one hand (47 clusters were examined, which almost covered their whole Polish population), while on the other hand, contributed sufficiently to developing clear recommendations for the clusters on how to improve their relative position to the benchmarks identified. Ipso facto, a basic condition of benchmarking (not to concentrate on the, position in the ranking" but to find a way of improving the strategic position), was met.

As well as the method of calculating benchmarks is concerned, the authors proposed to distinguish its two types:

- a sub-synthetic benchmark – calculated for 18 sub-areas on the basis of maximum values of individual indicators,

- a synthetic benchmark – calculated for 5 core areas on the basis of arithmetic mean of the benchmarks for the subdivisions.

What is more, clusters that participated in the benchmarking project, were positioned not only with reference to benchmarks (which were computed mathematically and thus had no reference with any single existing cluster), but also with reference to the rest of population. As a consequence, clusters were able to assess their benchmarking gap both towards a hypothetical (mathematically computed) benchmark, but also to the maximum, mean and minimum values obtained for other clusters that took part in the research.[113]

Although the methodology of Polish cluster benchmarking was designed to the specificity of national context, it drew on the European acquis in this field. However, the idea of benchmarking of clusters is quite new in Europe. Till now, only a few pilot projects have been conducted in this field.

Among those, one can start from "The Cluster Benchmarking Project – Benchmarking clusters in the knowledge based economy", a project conducted from 02.2006 – 11.2006 by the Nordisk Innovation Center, aiming at developing "an internationally standardized tool for analyzing cluster performance and cluster-specific policies across countries and regions."[114] Among the main areas of benchmarking, its authors chose: 1. framework conditions (e.g. regionally available human resources, R&D activity, instruments of cluster financial supporting, etc.), 2. Cluster performance (in the field of human resources improvement, knowledge creation and dissemination as well as supporting entrepreneurship) and 3. economic output understood as the measurable impact on the regional/national economy (in terms of employment, wages, productivity and exports.).[115]

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[112] Based on N. K. Denzin, who in 1970 actually distinguished four forms of triangulation: data triangulation, investigator triangulation, theoretical triangulation as well as methodological triangulation (N. K. Denzin, *The Research Act: A Theoretical Introduction to Sociological Methods*, Aldine Transaction, Chicago 2009, p. 301).

[113] It is worth noting that methodology is also a subject of continuous monitoring in order to catch up with any possible conditions that can influence the need to modifying it. As a result, the authors of this paper, as the reviewers of general and detailed reports of the project, contributed to adjusting the methodology by proposing some modifications. For example, the next benchmarking of Polish clusters will be based on a reduced number of indicators (4 core areas, 15 specific sub-areas and detailed 49 indicators)

[114] http://www.nordicinnovation.net/prosjekt.cfm?id=3-4415-216m, accessed 21.04.2011

[115] T. Andersen, M. Bjerre, E. W. Hansson, *The Cluster Benchmarking Project*, Nordic Innovation Centre, November 2006, p. 25

The main conclusion of this pilot project was that it is possible and feasible to build a (internationally comparable) model for benchmarking clusters. Additionally, four methodologies for mapping clusters have been examined in detail as well as current projects of analyzing and benchmarking clusters.[116] However, the authors did propose a potentially valuable tool of cluster benchmarking but did not test it on a broad scope of existing network organizations of this type.

Another attempt of benchmarking clusters was carried out in 2007 in the framework of "Europe Innova" initiative. The so called ABC-Network project, funded by the European Commission (EC) within the 6th Framework Programme (FP6), aimed at strengthening and improving entrepreneurial innovation and competitiveness in the agro-food sector through enhancing the networking between existing and potential clusters focusing on animal and vegetable biotechnologies applied to the agro-food sector (Agro-Biotech Clusters).[117]
The diagnostic part of this benchmarking was based on the 49-questions-questionnaire structured in 6 fields:

- General profile of the cluster
- Barriers and best practices to innovation and networking
- Governance systems
- Strategy of the cluster
- Results and impacts of the cluster
- Services offered by the cluster

Research took place at the end of 2006 and early 2007 and 13 Agro-Biotech Clusters were benchmarked. The result of the diagnostic part of benchmarking helped to create a comparable portfolio of clusters from a few European clusters (Austria, Estonia, France, Italy, Spain, Sweden, United Kingdom) as well as clusters form Brazil and Canada.[118]

Nowadays, Europe Innova continues supporting cluster benchmarking initiatives by maintaining the web benchmarking platform http://www.clusterobservatory.eu. The European Cluster Observatory is an online platform that provides a single access point to information and analysis of clusters and cluster policy in Europe. Originally launched in 2007, it provides data and analysis on clusters and competitiveness, a cluster library, and a classroom for cluster education.[119] Presently, cluster observatory is rather a bank of basic data about an increasingly large number of European clusters but has a potential to become a tool of benchmarking diagnostics in the future.

Another project contributing to growing knowledge resources and expertise for clustering is the European Cluster Excellence Initiative, which started in September 2009. This project is realized by a consortium of 14 partners from Austria, Denmark, Norway Estonia, France, Germany and Spain.[120] A part of this initiative, aiming at the dissemination of the idea of clustering and the knowledge about clusters for their managers, is also leading the so called Clusters Collaboration Platform, where registered users can exchange, as well as peer data about other European clusters. The objective is to improve their performance and increase their competitiveness through the stimulation of European and international cluster cooperation.[121] In other words, it provides an opportunity to compare similar organizations, which is an important starting point of every benchmarking procedure.

One of the latest projects conducted in the framework of European Cluster Excellence Initiative, is The NGPExcellence Project (Cluster Excellence in the Nordic Countries, Germany and Poland). The project was initiated by the Danish Agency for Science, Technology and Innovation (DASTI), the

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[116] Localization quotient method, the new geographical method, the input-output method based on export data, asking experts and the snowball method; for more details see: T. Andersen, M. Bjerre and E. W. Hansson, *The Cluster Benchmarking Project*, Nordic Innovation Centre, November 2006, pp. 15-22
[117] ABC-NETWORK., *Network of European Agro-Biotech Clusters. Benchmarking study*, May 2007, p. 4
[118] ABC-NETWORK., *Network …*, op. cit., pp. 34-46
[119] http://www.clusterobservatory.eu/index.html#!view=aboutobservatory;url=/about-observatory/,accessed 21.04.2011
[120] http://www.cluster-excellence.eu/3555.html, accessed 21.04.2011
[121] Ibidem

Nordic Innovation Centre (NICe) and the Nordic Council of Ministers[122]. The methodology employed in this benchmarking has been developed by the Agency Kompetenznetze Germany. On its basis, benchmarking projects have been realized in several European countries. Benchmarking was addressed to two groups involved in cluster development issues, namely cluster managers and cluster policy makers. In both cases, benchmarking was based on a diagnostic tool comprising of interviews including both quantitative and qualitative dimensions, conducted by clustering experts. Among the main dimensions for benchmarking of cluster management we can mention: 1. structure of the cluster, 2. cluster management and governance, 3. financing, 4. achievement and recognition. Among the main dimensions for benchmarking of cluster support programs, two dimensions were identified: 1. policy instruments and 2. context of the programs.[123]

Among other foreign benchmarking projects it is also worth indicating the "Benchmarking of IKT Grenland Cluster" with relation to other ICT clusters.[124] In 2009, the Norwegian IKT Grenland cluster was analyzed and compared with clusters from the ICT industry from Germany and Denmark. The study concentrated on such dimensions as: cluster structure, its financing, market activity, internal processes, the level of internationalization and finally, achievements and performance. The total number of 47 indicators were defined in these areas. The results of the study shed light on the strengths and weaknesses of IKT Grenland in specific dimensions, as well as on potential directions for its development. The report was prepared in cooperation with the Institute of Innovation and Technology and the Kompetenznetze Deutschland (German Competence Network Agency). The end result of the study was such that the IKT Grenland was put on the list of clusters which ranked the highest in comparative analysis.[125]

As far as benchmarking expertise in Poland is concerned, in 2010 the Polish Agency for Enterprise Development conducted a benchmarking of Polish technology and science parks, which was an updated and improved version of a similar project conducted in 12.2007 – 04.2008.[126] In this case, the basis for operationalizing the scope of benchmarking was "Balance Scorecard" (BSC) – a tool derived from the business management field, popularized in the 1990's by R. Kaplan and D. Norton[127]. Following this methodology and suiting it to the needs of quasi-public organizations, the author of the benchmarking of Polish technology parks proposed an analysis of four perspectives[128]:

- Financial perspective, including financial sources and ability of self-financing
- Stakeholders' perspective, including value for park tenants and contribution of parks performance on regional development
- Internal processes perspective, including the stage of parks' creation and their effectiveness
- Innovation and learning perspective, including improving human resources and processes of knowledge creation and transfer.

[122] Partners in this project are: VINNOVA and Tillväxtverket - Sweden, TEKES - Finland, the Research Council of Norway and Innovasjon Norge - Norway, RANNIS - Iceland, Nýsköpunarmiðstöð Íslands / Innovation Center Iceland, the Danish Ministry of Science, Technology and Innovation, the Federal Ministry for Economics and Technology - Germany, the Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology - Germany, PARP - Polish Agency for Enterprise Development, the Nordic Council of Ministers and the Nordic Innovation Center.

[123] http://www.clustercollaboration.eu/documents/10147/18505/broschure-ngpe.pdf, accessed 21.04.2011

[124] G. Meier zu Kocker, *Cluster Benchmarking Report*, IKT Grenland, Institute for Innovation and Technology, VDI/VDE Innovation + Technik GmbH, Berlin 2009

[125] Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 16-17)

[126] B. Kowalak, *Benchmarking Parków …*, op. cit.

[127] R. S. Kaplan, D. P. Norton, *The Balanced Scorecard – Measures that Drive Performance*, "Harvard Business Review", Jan.-Feb 1992, pp. 71-79.

[128] A. Jabłoński, M. Jabłoński, T. Marona, A. Szwej, M. Musztyga-Dawidowska, A. Lech, *Metodologia benchmarkingu parków technologicznych w Polsce*, unpusblished manuscript, Polish Agency of Enterprise Development, Warsaw 2009, p. 20; following: B. Kowalak, *Benchmarking Parków …*, op. cit., p. 14

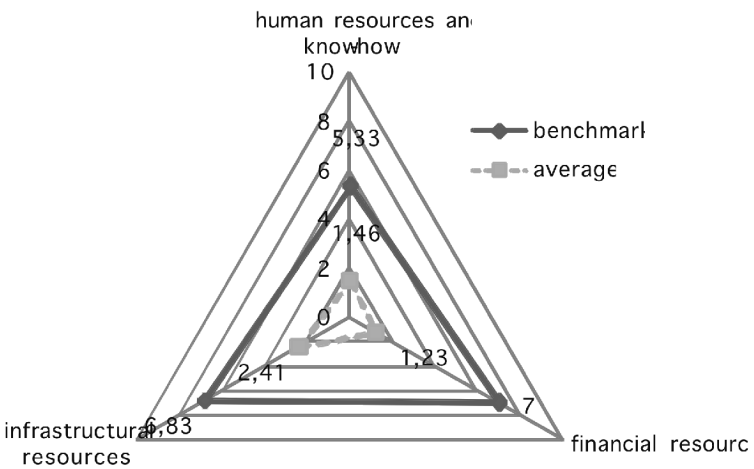
The results of cluster benchmarking in Poland

The benchmarking of Polish clusters (the first exhaustive study of this kind) was conducted in 2010 and covered a population of 47 entities. In effect, 47 secret benchmarking reports, dedicated to each cluster, were prepared. Except for expertise addressed to individual actors, one overall report has been published.[129]

The population of clusters that took part in the project, included diverse actors. Clusters came from various business sectors, representing various development stage, size, region of origin, the way each cluster was established, organizational form, aim of existence or factors determining success. According to the initial assumptions, cluster benchmarking analysis covered five defined areas: cluster resources, processes in the cluster, the cluster performance, growth potential and strategy of the cluster.

Cluster resources are the first area of the cluster benchmarking study. It should be underlined, that this area revealed some problems due to low average scores of all sub-areas.[130]: human resources and know-how, financial and infrastructural resources. In fact, only a few clusters possessed a strong potential of internal resources.

Figure 1.
Benchmark values and average values for the area "cluster resources"



Source: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 47.

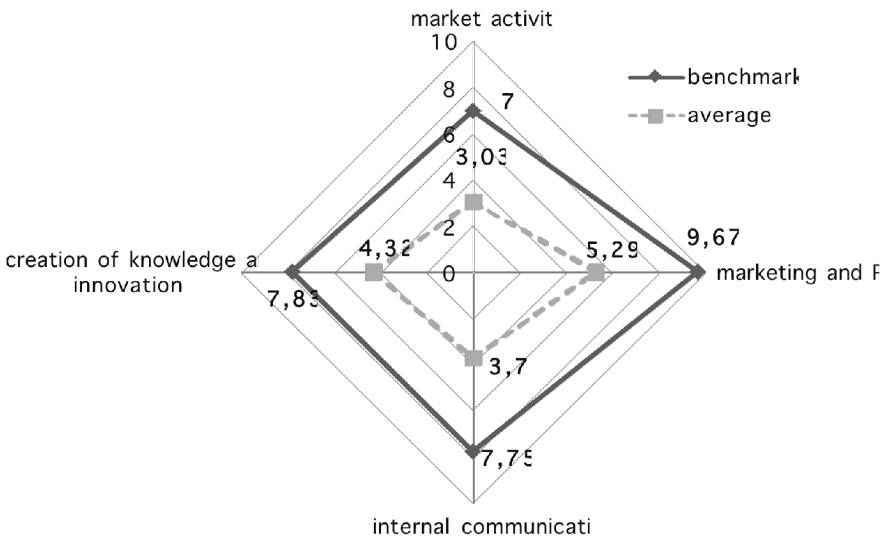
The lowest benchmark value and average value is observed in the "infrastructural resources" sub-area, which can be partially explained by the fact that most Polish clusters are today in an initial phase of development. For example, the cooperation with research and development entities, which usually provide clusters with laboratory space, is just in the beginning stages. Some of the clusters do not take this cooperation or implement it to a very limited extent. However, this sub-area is rated higher in

[129] Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit.
[130] Having the intention of showing only the overall picture of the level of Polish cluster development and bearing in mind the need to protect the market secrecy of enterprises operating in clusters, the authors use the average values (not assessing the particular cluster) for formulation of general conclusions from the study.

clusters working in innovative industries. What is interesting is that companies and institutions operating within the network assess their own human capital and knowledge potential relatively highly. However, one must indicate the low level of utilization of these resources from the perspective of their impact on strengthening the competitiveness and performance of the cluster. When identifying the internal barriers, representatives of surveyed clusters often reported the lack of financial support from public authorities. They explained most problems with acquiring the satisfying level of economies of scale and limited financial resources for realizing common ideas and projects. However, analyzing the level of cluster competitiveness, one should state this kind of reasoning is a major simplification. What is more, the authors state a contrary thesis that nowadays *clusters in Poland need mainly to strengthen their internal social capital (based on mutual trust) and identify the "reasons to cooperate", while the argument about the lack of financial resources as the primary barrier of development is just a convenient postulate in relation to the authorities, but not the main problem*. Nevertheless, financial expectations of clusters reported to public authorities are justified, since especially in the initial stage of their development, public aid plays, in fact, a leading role. Over time, however, its role is decreasing in favor of private funds and cluster self-financing (including the possibility of joint contributions and membership fees).[131]

The next benchmarking area concerned measuring and comparing processes in the clusters. The high appreciation of this part of the analysis stems from the overall high level of activity of the entities in the sub-area appropriate for the incubation phase, primarily in the field of marketing and public relations. Also, the relatively good results for the sub-area "knowledge and innovation" was observed. This can be explained by the many joint initiatives in the field of training, study tours, participation in conferences or their organizations and exchange of experiences between members of the cluster. Unfortunately, these are not the activities strictly related to the transfer of product or technological innovations.

Figure 2.
Benchmark values and average values for the area „processes in the cluster"



Source: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 75.

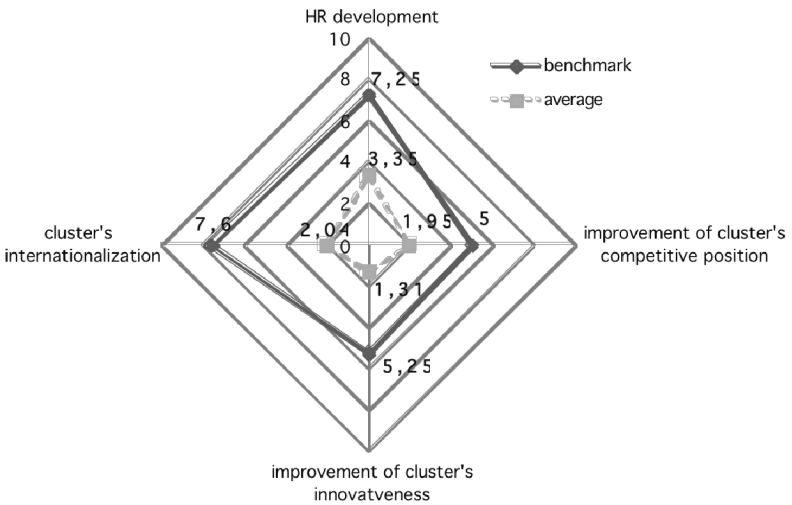
In the area of processes in the cluster, the sub-area depicting market activity was identified among the lowest-ranked. One of the most common reasons for this is a lack of knowledge about possibilities of

[131] O. Solvell, G. Lidqvist, C. Ketels, *The Cluster Initiative Greenbook,* Stockholm 2003, p. 12

collective activities in this field, as well as a low level of internal communication among cluster members. What is more, we identified that also uncertainty and lack of confidence were responsible for not building dense internal links for shared channels of the supply of goods and raw materials.

As far as internal communication is concerned, if it is identified, it takes a relatively effective form of building relationships through regular and often informal meetings of the participants.[132] One should note that the ability and high level of communication within the network is a prerequisite for understanding business partners, and consequently for the increase in the level of trust and minimizing transaction costs.[133] The latter, one should add, especially in the initial stage of cluster development, is one of the main aims of its existence.

Figure 3.
Benchmark values and average values for the area "cluster performance"



Source: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 119.

Another important sub-area of the benchmarking procedure presented in this paper (since it helps to evaluate the effectiveness of clustering phenomena in Poland) is the analysis of cluster performance.[134] Here, a particularly low level of the benchmark and the average value is identified in the "improvement of cluster innovativeness" sub-area. It is very rare for the cluster participants to engage

[132] It is worth recalling that business relationships of this nature provided a foundation for success of high-tech industries to the world's famous clusters in Silicon Valley and Route 128 (see: A. Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*, Harvard University Press, Cambridge 1994).

[133] Transaction costs result from the fact that in addition to the market price paid to finalize transaction, economic entity should consider also other costs associated with searching for contractors, negotiating prices, costs associated with the risk of unreliability of contractors, transaction fees, insurance, etc (A. Nowakowska, Z. Przygodzki, M. E. Sokołowicz, *Region w gospodarce opartej na wiedzy, Kapitał ludzki-innowacje-korporacje transnarodowe*, Difin, Warszawa 2011, p. 142). Thus, effective internal communication within cluster works as an alternative for both market (avoiding high market transaction costs) and hierarchical organization (avoiding high "internal" transaction costs).

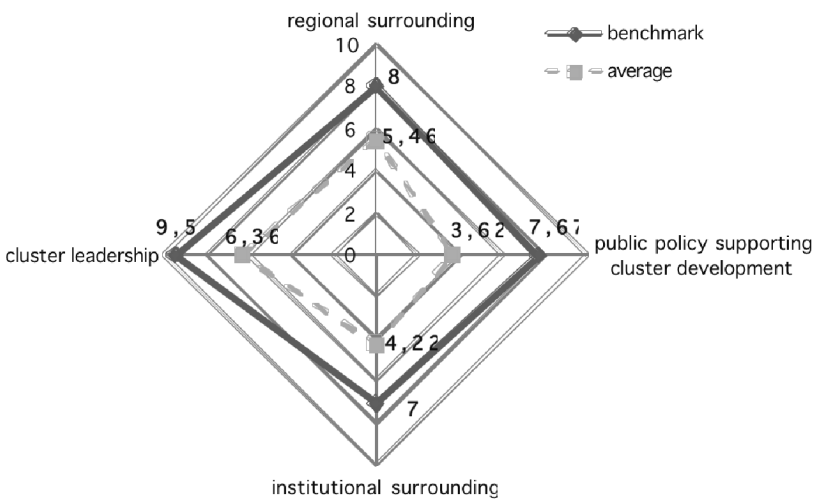
[134] In this respect, there are significant discrepancies between the benchmark values and average values in each sub-area. This is caused by the fact that 25 out of 47 clusters are still in the initial phase of development (incubation). Hence, from the perspective of two years or few projects, it is difficult to see the actual effects of their activity, e.g. to assess the level of achievement of their goals. On the other hand, few Polish clusters that are already in their growth phase, have achieved four times higher results than the average level of 48 surveyed entities.

in common R&D activities, to involve in intellectual property protection procedures or to conduct research projects of international character together. If this type of activity takes place, it is identified primarily in clusters operating in innovative sectors. Consequently, relatively low values were also identified in the sub-area concerning the improvement of the competitive position of the clusters, which is defined largely by its innovative capacity. The only sub-area with relatively high values was observed in the increase of the number of participants in clusters in recent years.

Assessment of the level of internationalization of clusters should lead to the conclusion that it takes mainly its simplest form, i.e. exports. What is more, the scale and scope of the internationalization of Polish clusters is still small. When it comes to the level of human resources development, cluster performance is reflected mainly in some quantitative changes. It means, that only the number of people employed by entities operating in clusters has changed significantly, while relatively small changes have occurred in the structure of employees improving their qualifications as well as the availability of instruments contributing to the building of human capital in clusters.

In the area of cluster growth potential, relatively high average values were noted, which draws a rather positive favorable picture of the perspectives for Polish clusters in the future. Especially high values were observed in "cluster leadership" sub-area. The evaluation revealed that indeed, cluster coordinators/facilitators have the greatest impact on the current shape and development of internal networks. However, also cluster environment, both the regional and institutional one, are the important elements for strengthening the competitive capacities of clusters. The lowest-rated area in this respect was the cluster development policy of public authorities.

Figure 4.
Benchmark values and average values for the area of "the growth potential"

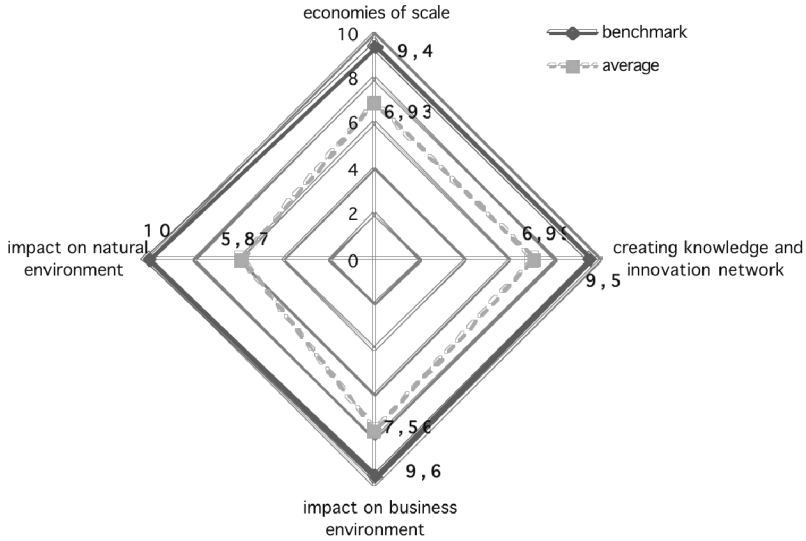


Source: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 150.

The last area of the benchmarking project was strategy of the cluster. It should be noted that despite the lack of a coordinated government cluster policy, it was mainly the design of tools established by public authorities to support cluster development in Poland, which really strengthened clusters through the institutionalization of their structures in the last few years (most Polish clusters operate as formally registered organizations). It is also worth noting that about 90% of clusters admit they have a plan for their activities, of which 66% have a strategy as a written formal document. The main strategic goals of Polish clusters relate to increasing opportunities of impact in the business *milieu*, which means primarily: the growing importance of market brand of both cluster and the region, the increase of the

cluster position towards its environment (biggest purchasing and lobbying power) and also, attracting new talents and subcontractors to the regions. Besides, clusters also underline the will to create networks for the diffusion of knowledge and innovation as important part of their strategies. Although nowadays these objectives are rather of not an operational but declarative nature, it should be noted that there are already good practices in this field that have been presented in the dedicated reports.

Figure 5.
Benchmark values and average values for the area of "cluster strategy"



Source: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 199.

Another category of strategic objectives often indicated were also the economies of scale, especially in obtaining external funding and the possibility of lobbying for the industry. Slightly fewer cluster members expect that participation in the network will increase their competitive advantage towards suppliers, customers, or will help to coordinate the market of buyers.

Conclusions

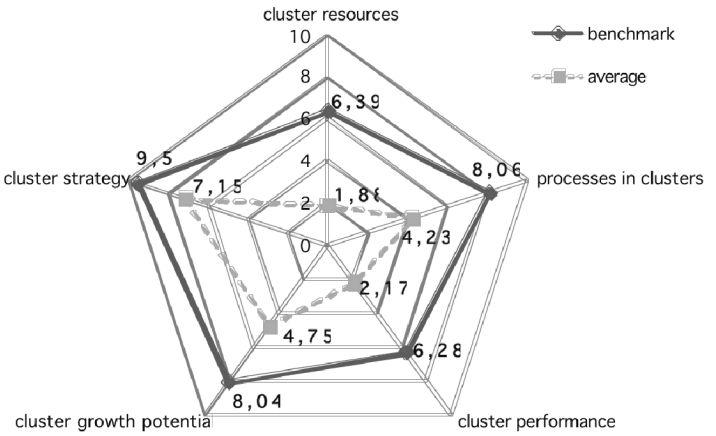
Concluding, one must state that in Poland, similarly to the rest of Europe, benchmarking is becoming a more and more popular tool of measuring the excellence of not only single enterprises but also clusters and many other public and quasi-public organizations (cities and regions, technology and science parks already mentioned, but also: airports, universities, energy suppliers and health care organizations)Although in those field, of research activity one can note different methodologies, they have at least two characteristics in common:

- each is heuristic and uses a combination of quantitative and qualitative approaches;

- each refers to the need to analyse both internal processes and organization outcomes (internal perspective) and organization environment (external perspective).

Also, each benchmarking project indicates the important role of innovation and learning in the processes of improving competitive advantage. However, each project does it with a different emphasis. On the other hand, what is rather neglected in most projects is an attempt to capture the institutional and regional context. In this background, the benchmarking of Polish clusters was the first effort to assess the impact of regional specificity on cluster excellence.

Figure 6.
Benchmark value and the average for the analyzed areas



Source: Deloitte, *Cluster Benchmarking in Poland – 2010*, …, op. cit., p. 231.

The benchmarking of Polish clusters has revealed that they possess a strong endogenous growth potential and there is a strong determination of local businesses to integrate around common aims. However, the ability to build and support cluster development is substantially weakened by a very low overall assessment of internal resources. In addition, a similar situation is observed in the area of cluster results, which is generally caused by their short history. On the other hand, what is rated highly is the growth potential of clusters, especially in the medium and long term. The diagnostic part of benchmarking highlighted this situation by the high ratings of individual indicators and in consequence the average values for the "cluster strategy" area. Despite the low rating of cluster resources (as a base) and cluster performance (as a tangible benefits of functioning in a network), the general results of benchmarking in the area of cluster processes allows an optimistic forecast about the future of cluster development in Poland.

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ABSTRACT

The concept of clusters has a long tradition, dating back to A. Marshall's idea of industrial districts, developed further by many scholars and researchers, concentrating on the issues of local production systems, innovative milieux and many others. Despite many conceptual differences between those problems (sometimes very substantial), what is really common and links these schools – refers to the importance of territory (treated both in terms of geographical as well as cognitive, institutional or social proximity) in building effective cooperation networks, providing the essence of clusters. Although clusters stand for popular intellectual conception among regional economists and their support is also becoming an important tool of regional and industrial policy in European countries, there are still many research gaps in this field. Therefore, a study aiming at identifying the activity of clusters has been conducted in Poland recently. Among many results, valuable from both a theoretical and practical point of view, one has noticed that the success of Polish clusters depends greatly on the quality of the regional environment in which they operate. The aim of this paper is to present the methodology and main outcomes of the first complex benchmarking project of clusters in Poland, in order to identify the significance of the regional and institutional environment in cluster development. Consequently, it helps to contribute to the question, to what extent "territory matters" in the activity of Polish enterprises, exposed to the challenges of internationalization.

RÉSUMÉ

Le concept de cluster remonte aux districts industriels d'A.Marshall, concept développé depuis par de nombreux spécialistes et chercheurs qui se sont concentrés notamment sur les questions relatives aux systèmes de production locaux et aux milieux innovateurs. Malgré de nombreuses différences conceptuelles, le cluster, pour l'essentiel, se réfère à l'importance du territoire (en termes de couverture géographique mais aussi cognitive, de proximité institutionnelle ou sociale) dans la construction de réseaux de coopération efficaces. Bien que le cluster soit très utilisé par les économistes régionaux, et qu'il soit devenu un outil important de politique régionale et industrielle en Europe, il existe encore de nombreuses lacunes dans ce domaine. Une étude visant à identifier l'activité des clusters a été menée récemment en Pologne. Parmi les nombreux résultats, utiles du point de vue théorique et pratique, on a remarqué que le succès des clusters dépendait fortement de la qualité de l'environnement régional dans lequel ils opèrent. Le but de cet article est de présenter les résultats et la méthodologie principale d'un projet d'analyse comparative afin de déterminer l'importance de l'environnement régional et institutionnel dans le développement des clusters. Ceci peut contribuer à mesurer l'activité des entreprises polonaises exposées aux défis de l'internationalisation.