

QUALITY AUDIT OF THE CLUSTER MANAGEMENT, INSTRUMENT OF ACCREDITATION AT EUROPEAN LEVEL

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Abstract: *Clusters are complex structures, flexible and dynamic, continuously changing. In Romania cluster associations is moving towards a new stage of development, marked by european recognition of performance through audits performed by the European Secretariat for Cluster Analysis.*

Obtaining certification has credibility clusters, facilitating access to collaborations and partnerships with other clusters in Europe for the development of joint projects and it plays a role in promoting them.

This article aims to present evaluation methods of clusters and to identify clusters in Romania whose performance has been audited and labeled by the international authorities.

Romanian clusters bronze label granted by an international body empowered attest to initiate the process of improving the quality of management.

Keywords: *cluster, quality labeling, auditing, benchmarking, bronze label.*

JEL Classification: *M21, M42, P17*

1. Introduction

Changes in the structure of industries in developed economies have generated changing nature of clusters. If at first clusters were formed in the industrial and manufacturing production, in recent years they have turned to innovative sectors based on science and technology (Dolphin, 2014).

Clusters are older than 20 years at european level, but in Romania recently occurred, at 4 - 5 years ago and is currently in the stages of generation and growth. Their maturity will be proven by evaluation of involvement in various projects. Capacity assessment clusters to obtain competitive advantages are achieved using specific methods and tools, quantitative, qualitative or mixed and undertaken by public or private, national or international level.

The article presents the evaluation methods for clusters, identify clusters of Romania whose performance has been certified internationally and highlights the link between clusters involved in grant projects and obtaining quality labels.

2. Conceptual and methodological approach

Innovative clusters are forms of public-private partnership include companies, research institutions, financial institutions, public authorities, organizations catalyst that put in connection the members, with the main objective to increase their competitiveness through innovative knowledge transfer.

In the literature, the formation of clusters is associated with the existence of geographic proximity element. Industrial agglomeration in a certain area that allowed access to natural resources and key markets, led to the formation of clusters.

In other cases approaching a research center, university or an innovative company that generates new knowledge and qualified labor force, attracted entrepreneurs and clusters were formed.

According to Garnsey (1998) and Porter (1998), universities, research centers or innovative companies represent critical element for the formation of a cluster.

Geographical proximity is a key characteristic of clusters leading to the transfer of knowledge between companies and institutions (Andersson et al, 2004).

Researchers identified other factors necessary for the emergence of a cluster: skilled labor, regional tradition, historical conditions, industry structure, local politics. (Brenner and Mühlig, 2007).

In other cases clusters were set accidentally, due to a triggering event such as an innovation or initiative of people with entrepreneurial spirit. Essence associations consists of interdependencies between companies, public authorities, government, people, financial institutions, professional associations.

According to Porter, in clusters coexist the competition and cooperation “in different sizes and from different players” (Porter, 1998: 79).

Typology of clusters, common characteristics and traits that distinguish them location regarding location, composition, size, performance have been addressed in detail by researchers.

Physical proximity is a common feature of clusters that leads to economic agglomeration and spatial concentration. According to the observations made by Weber, Marshall and Schumpeter, in areas where the clusters are located producing economies of agglomeration, because companies situated in the same space benefit from reducing transaction costs and information transfer. (Weber, 1909; Marshall, 1925; Schumpeter, 1934; Krugman, 1991). In these areas there are companies with flexible production systems that use social capital with multiple communication links and that have developed collaborative networks of producers and suppliers.

Companies are grouped to benefit from the availability and qualification of the local labor force, the availability of providers of information and ideas, and dissemination of knowledge among economic actors is important to promote the development of modern clusters (Scott and Paul, 1990; Saxenian, 1994).

The benefits of clustering led researchers to identify and analyze the factors influencing the evolution of clusters. They found that in many cases, clusters have emerged unplanned and went through a dynamic process life cycle, similarly to the life cycle of a product or industry (Sonderegger and Taube, 2010, 384). In evolution, a cluster can cover the following stages: appearance, growth, maturity and decline. Depending on the stage of the life cycle they are in, the cluster has distinctive features and behaviors.

During evolution the cluster, the forces that supporting cluster growth are not necessarily the same forces that led to the formation of cluster. It is a challenge to develop a cluster starting at the planning stage cluster. Through policy interventions, it can support the development of an existing cluster, but this requires an understanding of the functioning and characteristics of different types of clusters. Although there are differences between clusters, are important characteristics common to certain groups of clusters.

3. Methods of evaluating the performance of clusters

The essential characteristic of a cluster is competitiveness, the ability to achieve success and outstanding performance through cooperation and competition with the environment in a given time horizon. Evaluation capacity and ability of clusters to obtain performance is done with some methods and tools (Pater and Popa, 2013), namely:

a) Qualitative assessment is based on the use of qualitative information obtained through questionnaires applied at national, branch, region of development, at the level of the cluster; depth interviews; statistics; studies; monitoring and evaluation reports of financing programmes. In the qualitative analysis programs are used vectors (Coșniță and Iorgulescu, 2013):

- Geographic concentration - concentration of industries in the region or below;
- R & D - research and development component existence in the geographical agglomeration hereby universities or research organizations;
- Workforce - quantity, quality and qualification of the workforce in the economic agglomeration;
- Cooperation - existence of some collaboration between cluster members is an essential element for distinguishing a cluster to a branch well represented at regional level;
- Institutions catalyst - the existence of organizations (technology transfer centers, chambers of commerce, consultants) with a role in reconciling the organizations for establishing the association;
- Internationalization - cluster orientation towards international markets.

Qualitative analysis carried out at national level highlight the potential for clustering branches in Romania: the automotive industry; IT&C; agro-food sector; logistics; renew-ables; textile industry; wood industry and furniture (Coșniță and Iorgulescu, 2013, p. 35).



Figure 1. Assessment methods of clusters

b) Quantitative analysis is performed using indicators of economic size: importance; size; concentration, specialization, innovation, export (Coșniță and Iorgulescu, 2013);

c) Mixed assessment is a quantitative and qualitative assessment;

Romanian Cluster Association used to assess cluster mixed analysis, both quantitative and qualitative. Qualitative analysis is performed using factors: geographic concentration, research and development, employment, cooperation, internationalization, institutions catalyst, and the quantitative analysis consider the contribution to GDP, number of employees, innovation (according Methodology Scoreboard Innovation) and exports (in terms of quantity). Working method consists in calculating a composite index, P, which include: the importance, size, innovation and exports;

d) Mapping of clusters is a tool to identify on a statistical basis, clusters existing in various stages of the life cycle in a given geographical area;

e) Certification of clusters is performed by an accredited organization, national and regional authorized using standard procedures (DIACT, 2006);

f) Unlike economic impact analyzes, benchmarking is an analysis that aims to identify potential cluster and develop strategic recommendations for cluster development in a short time (<http://www.cluster-analysis.org>). By benchmarking is done comparative analysis of structures, processes, products and services clusters in the same field and / or best practices of entities in other areas. The goal is to identify performance clusters in order to improve so their structures, processes, products and services.

Experts of European Secretariat for Cluster Analysis done interviews with cluster managers lasting about two hours, within which are analyzed 36 indicators regarding the size, organization, structure, management, governance of cluster and funding of cluster cluster organization, the services provided by organization cluster, communication within the cluster and the cluster image.

The result of cluster analysis is presented in a benchmarking report includes graphical comparison of the cluster with others clusters in the same area and with clusters of excellence in Europe.

The report included recommendations to improve cluster. Cluster portfolio for benchmarking is over 706, from 38 countries. Data collected and compiled reports are confidential and may not be available to third parties.

4. Auditing clusters at european level

Appraisal of clusters at European level is undertaken on the basis of a methodology accredited by the European Commission through the European Initiative Excellence Clusters (ECEI). Accreditation is awarded following an assessment made pursuant to a european standard procedure. Acquiring a certification label involves assessing the cluster by following a standard set of questionnaires conducted by certified experts European Secretariat for Cluster Analysis (ESCA).

Based on the assessment by benchmarking is presented a report of analysis and a set of recommendations for the development and strengthening cluster.

Clusters quality labeling system is organized on three levels: bronze, silver and gold.

Bronze label is the first step in the international recognition of clusters, a quality mark narrowly and certifies cluster management is interested in improving management performance.

Cluster management organizations that do not meet the conditions for obtaining gold label, but demonstrates that both cluster and potential partners follows the path for excellence in cluster management may be subject to an audit to obtain silver label.

Silver label of European Initiative Excellence Cluster is a quality brand itself, confirming the successful implementation of the recommendations to improve initiated as a result of a comparative analysis to obtain bronze label.

Audit to obtain silver label performs in three stages:

The first step is an analysis of benchmarking using methodology for obtaining the label bronze, after a period of 1.5 to 2 years from the first analysis.

The second step involves identifying three areas in which quality indicators of European Initiative Excellence Clusters have improved.

The third step consists in making a site visit by an auditor to validate the areas of improvement. To validate improved areas are used as reference criteria relevant for these domains to obtain gold label.

Gold label is a quality label based on high standards of cluster management practices.

This is achieved by cluster management organizations that demonstrate a sophisticated management and that have committed to improve organizational structures to achieve high performance.

Cluster management organizations must meet certain "level of excellence" in terms of structure, governance, financing, strategy, services and recognition. During a thorough evaluation for two days performed by two experts in cluster analysis are evaluated 31 indicators.

The rating system was developed by the European Initiative for Excellence Cluster (www.cluster-excellence.eu), the process was initiated by the European Commission through 13 organizations from nine European countries, with expertise in cluster management and cluster policy.

The objective of gold labeling is not only to identify best management cluster organizations in Europe, but especially to provide management support to organizations in the evaluation on how to improve future performance. Since 2010 until now, 689 clusters, mostly from Europe were labeled with bronze, 7 received silver label and 47 clusters have been certified with the degree of excellence in management through gold label.

5. Cluster management excellence in Romania

Clusters of Romania are turning to a new evolutionary stage. If until two years ago there were about 30 active clusters, driven european funds dedicated to them, their numbers began to encrease.

According to Cluster Association in Romania, in late January 2015, Ministry of Economy - Department of Industrial Policy and Competitiveness records 79 clusters and competitiveness poles.

Of these organizations, eight poles of competitiveness were selected for funding under the of the Sectoral Operational Programme "Increase of Economic Competitiveness (SOP IEC) 2007-2013", Operation 1.3.1 "Competitiveness poles" and 27 clusters were selected for funding in Operation 1.3.3 "Clusters". 30 clusters are members of Cluster Association in Romania – CLUSTERO, representative body of national and international clusters in Romania.

Regarding certification of clusters, 13 clusters have been awarded the bronze label for excellence in cluster management following the benchmarking exercise conducted by the European Secretariat for Cluster Analysis.

According to data posted on the website of the European Secretariat for Cluster Analysis, accessed in April 2015, in Romania seven clusters are labeled bronze certificate until late 2015 or 2016. The certification attests to initiate the process of improving the quality of management.

Bronze label, issued by the European Secretariat for Cluster Analysis (ESCA), is valid for 2 years and is used to facilitate access to opportunities to work with clusters in Europe, partnerships and developing joint projects.

In Romania of the approximately 73 clusters, 13 were labeled with bronze. European recognition was possible through the projects development of "excellence in cluster management" in Romania, funded by the European Commission under grant programmes.

In Romania were accredited by the European Secretariat for Cluster Analysis seven experts in benchmarking who have the competence to conduct the interview at any cluster in Romania, in order to qualify bronze and benchmarking report.

By labeling, clusters receive European recognition by uniform assessment instrument of excellence in management, awarded by the European Initiative for Excellence Cluster.

Romanian clusters owning bronze label are:

Table nr.1 **Romanian accredited clusters at european level**

No.	Cluster name	Domain of activity	Web adress	The date on which they are accredited
1	iTechSylvania	IT&C	http://www.aries-transilvania.ro/	2016/12/16
2	High Tech Cluster/ELI - NP Cluster Inovativ – Măgurele	Optical technology	http://www.mhtc.ro	2016/08/14
3	AgroFood	Agri-food Industry	http://www.agrofoodcovasna.ro/	2016/12/16
4	Agro Transilvania	Agri-food Industry	http://www.agrocluster.ro	2016/12/16
5	Cluster Prelucrări Metale Transilvania (PrelMet Transilvania)	Manufacturing	http://transilvaniaprelmet.wordpress.com	2016/12/24
6	Cluster Mobilier Transilvan	Furniture Industry	http://www.mobiliertransilvan.ro/	2016/12/16
7	Pro Wood	Furniture Industry	http://www.prowood.ro/	2016/10/13

iTechSylvania cluster was established in 2013 in Cluj-Napoca, Romania north-west region and aims to increase competitiveness of members in advanced technologies, on the local and regional market. Cluster management entity is Transylvania Branch of the Romanian Association for Electronic and Software Industry. Members are public and private organizations from Cluj County - Cluj-Napoca town, Bihor County-Oradea, municipality, respectively firms in the IT and electronics domains, universities, public authorities and catalysts, according with the model "four leaves clover" (<http://www.aries-transilvania.ro/>).

The cluster has obtained financing in 2014 of the Sectoral Operational Programme "Increase of Economic Competitiveness (SOP IEC) 2007-2013", Priority Axis 1 "An innovative and eco-efficient production system", Operation 133 "Support for enterprises' integration in supplier chains or clusters" for human resource training in advanced technologies and strengthen institutional capacity of the cluster by integrating SMEs into this structure in order to improve their competitiveness in the global market.

In 2012 the cluster was composed of a total of 12 companies, 759 employees, a turnover of 161,682,208 lei and the export value of 15,481,753 euro.

Public and private organizations of cluster collaborate and act on behalf of producers of ICT, contributing to promoting the information society and development of the field in Romania. Additional approach and collaboration in the ICT sector are key factors in sectoral development and integration in the European digital economy.

High Tech Cluster / ELI - Innovative Cluster NP - Măgurele was founded in 2013 and is financed through the Sectoral Operational Programme "Increase of Economic Competitiveness (SOP IEC) 2007-2013" Priority Axis 1 "An innovative and eco-efficient production system", Major Intervention Domain 1.3 "Sustainable entrepreneurship", Operation "Support for enterprises' integration in supplier chains or clusters". The total funding granted to the cluster is 901,200 lei of which reimbursable financial assistance 892,200 lei (<http://www.mhtc.ro>).

Măgurele High Tech Cluster harness the opportunities created by the project Extreme Light Infrastructure - Nuclear Physics (ELI - NP) and the results of scientific research conducted at Măgurele Physics Platform. Cluster members are companies from the fields of optoelectronics, nuclear, ITC, civil construction, security, defense industries, software production, design and architecture, drilling, hydrology, energy, laser, metal, photography, audio visual, bio cosmetics (25); private companies in research (3); NGOs catalysts (5); research institutes (11) and local administrations.

The focus on this business area will lead to synergic results at local and european level by creating sustainable alliances between SMEs, R & D entities in Măgurele Physics Platform at and associated universities or through collaboration with CERN - Geneva where works the largest particle accelerator in the world, has directly expressed interest for cooperation with Măgurele Cluster.

The general objectives of the association aiming at increasing competitiveness of enterprises by making technology transfer between research institutions and business development, by acquiring research results of association members, collaboration with local and central public administration by developing research capacity, development and innovation and encouraging the access of businesses to research activities.

Cooperation between national research and development institutions and businesses environment facilitates members' access to applied research results from the Măgurele Platform of Physics, aiming to create a science, technological and industrial park in the city.

The project will contribute to the sustainable development of the productive sector by connecting SMEs in the cluster to enable a source of innovative ideas in the field of lasers which offers unlimited possibilities of realization of products / innovative services that do not pollute and that will have a great technological advance market to other companies.

The cluster creates a favorable environment for sustainable development of SMEs, due to the complexity associated entities and the operating mode, because SMEs grouped around a large entities, IFIN HH, a leading provider of products and services for Nuclear Plant Cernavodă and valences in RDI. Moreover, IFIN HH has the material resources required to ensure future funding and financial stability cluster for the entire group.

Agrofood regional cluster was established in 2011 in Covasna, in the food industry. The aim of the cluster is to achieve a partnership to support agro food businesses to increase their competitiveness through innovative knowledge transfer in the field of research and development.

The partnership combines the interests of entrepreneurs, research institutions, local authorities from Carpathian Arch region to produce and deliver competitive products. The objective of the cluster aims to develop a management strategy and identifying new solutions for products and services are competitive on international markets.

Cluster members have access to knowledge and experiences in technology and organization, the professional training, share costs and risk and exploit research results.

Agrofood cluster is composed of 25 companies from industries: milk, meat, beverages, agriculture, milling and bakery; 3 Universities; 2 Research Institutes; 6 public authorities; 15 catalysts; two individuals and banks. The cluster had in 2013 a turnover of 393,839,024 lei, a number of 25 companies and 1367 employees. In 2014, 2 companies have introduced product innovation, and 3 companies have innovated in partnership and two patents have been obtained (<http://www.agrofoodcovasna.ro/>).

The cluster achieved in 2012 funding from the INTERREG IVC program, totaling 964,249.70 euro to support entrepreneurship and competitiveness of SMEs.

Agro Transylvania cluster was established in February 2013 and active in the agro industrial sector in order to support increased competitiveness of members both on the national and international levels, based on a common development strategy.

The general objectives of the cluster aims at developing a framework of interaction between factors operating in the value chain in the agro industrial field; develop a platform for research, development and innovation and private sector orientation towards innovation and technology transfer; supporting the development of education offer according with real needs of businesses in the agro industrial domain; supports entrepreneurship by offering relevant solutions for the renewal and modernization of the sector.

The association aims to become a pole for agro food sector development, a strategic reference entity in professional and institutional field of business and recognized for the quality of its work and results. The cluster aims to create and develop an agro food marketing chain, essential for local products, through reducing production costs, as well as to ensure a steady markets for agricultural products from the territory of the acting cluster. The cluster aims to integrate small producers in associative forms for efficient use of local resources.

The main operational objectives of the cluster:

Determination of local food resources in Cluj county, especially those used inefficiently and those unused. Creating a cluster development strategy for period 2014-2020, which follow the development plan of the association and the development opportunities identified.

Streamlining management as a central element of the value chain of the cluster to be able to assume the role of integrator of agricultural production, primarily in the territory in which they operate cluster. Developing marketing chain facilities (warehouses, greenhouses, slaughterhouses, processing, showrooms), in according with the cluster development strategy for 2014-2020.

Developing skills and accumulation of information necessary cluster members and cluster as a whole, both technical, productive, and the conceptual analysis and synthesis.

Increasing the visibility and attractiveness of the cluster on the local, regional, national, international.

Creating a team of external sectoral experts will be consulted periodically to validate tactical and strategic decisions in the areas of processing, storage and marketing of food products of animal and non-animal; crop production, land reclamation and irrigation; growth and exploitation of animals; fruit, tree, vegetables and berries; beekeeping sector; the vine and wine; bio products sector; complementary sectors (consultancy services, veterinary, phytosanitary etc.); biotechnology sector, quality management and food safety management.

The cluster is financed under Sectoral Operational Programme Competitiveness 2007-2013 and is composed of a total of 22 companies working in the fields stated above, a total of three research organizations (University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, Cluj Napoca Technical University, National Institute Research and Development of Isotopic and Molecular Technologies); three catalysts, two public institutions (Cluj County Council, Local Council Câmpia Turzii).

In the year 2013 the cluster had a turnover of 201,199,022.00 lei, a number of enterprises 22, a number of employees 793 and investment spending value of 55,523,875.00 lei (<http://www.agrocluster.ro>).

Transylvania metal processing cluster - PrelMet Transylvania is established in 2013 and is co-financed by the Sectoral Operational Programme Increase of Economic Competitiveness 2007-2013. The overall objective is to increase competitiveness of enterprises and reducing disparities of productivity compared with average at national and EU level.

Cluster seeks growth for members of the cluster, in the first phase focusing on strengthening the management entity of the cluster, the increase the number of cluster members in metalworking domain and creating common information, technical, organizational and economic infrastructure. Productivity growth of cluster members is targeted of the stage of maturity of EMC, on a time horizon of minimum 5 years.

The cluster aims to achieve competitive advantages through innovation, increased efficiency and supporting the start-up and development of R & D activities and technology transfer, and coordinating activities and projects in the cluster, to promote international cluster, to improve cooperation between cluster members and attract new members.

The cluster is built with four leaf clover model and comprises 14 companies in the metal working and support areas, three universities, one research institute, 4 public authorities, three catalysts and one individual person. Turnover in 2013 was 460137 lei, the number of 481 employees, of which 94 with higher education, the number of 15 enterprises, exports 1933.873 euro and 931.27 lei average gross earnings. (<http://transilvaniaprelmet.wordpress.com>)

Transylvanian Furniture cluster was established in the north-west region of Romania, to support furniture industry and increased competitiveness of association and every member on the national and international market. One aim of the cluster is getting ergonomic, quality, competitive products through design, functionality and price, that meet the requirements of customers in domestic and foreign markets.

Cluster is cofinanced from Sectoral Operational Programme Competitiveness 2013-2020, Operation 1.3.1 - Develop business support structures of national and international interest - Competitiveness poles. The association

wants to attract a large number of companies in the furniture industry, manufacturers and suppliers of materials and auxiliary / complementary services, implementing a strategy and an action plan that aimed creating products and / or innovative technologies by material used, by design and functionality, results of research and development activities.

The cluster aims to create a proper value chain through easy access to resources and production factors cheap and quality, leading to increased productivity of factors and horizontal and vertical development, based on common standards for system supply - production - packaging - storage - selling - trading - transport, with a positive impact on the competitiveness of products on the market.

The cluster includes a total of 30 companies in the furniture industry and support areas, three universities, one research institute, a public authority and four catalysts.

Turnover increased in 2012 compared to 2011 with 23.35%, from 154,691,769.00 lei at 190,809,248.00 lei. The number of employees increased from 741 in 2011 to 841 in 2012. The value of exports increased in 2012 compared to 2011 with 35.73%, from 10,074,227.00 euro in 2011 to 13,673,572.00 euro in 2012.

(<http://www.mobiliertransilvan.ro/>).

Pro Wood cluster was established in 2010 in Covasna county, with the main objective to develop a real cooperation between wood processing firms, research institutions and authorities. The aim of the cluster is to develop a broad partnership to support enterprises in the logging, timber industry and furniture industry in Covasna and Brasov counties.

The cluster was obtained a grant of 200 000 euro from the SOP IEC 2007-2013, Operation 1.3.3 - Support for integrating businesses into supply chains and clusters. By financing obtained, the cluster will benefit from institutional capacity building of the association, attracting new members in an integrated supply chain, achieving the excellence in management and the enhancement of regional cooperation, increasing levels of training at the level of the management of SMEs, increased cooperation with CDI providers to identify innovative solutions for optimizing production processes.

The partnership was made to increase the competitiveness of these companies, to develop innovative products and services through the development of innovation and development projects, of a coherent policy cluster and awareness of legislation among members.

The cluster is composed of a total of 19 companies, 6 public authorities (5 Local Councils and a County Council), 3 professional organizations, a University - Transylvania University of Braşov - Faculty of Wood Industry, three secondary educational institutions, four catalysts.

Enterprises are specialized in production of wood and pale furniture, joinery products universal, semi-products for furniture, stairs, railings, carved furniture, wooden joinery and furniture, timber and solid wood moldings, solid wood joiner, wood house.

In 2013, the cluster had a turnover of 2119888435 lei, number of 19's enterprises, export value 2095694808 euro, the number of employees 689 (<http://www.prowood.ro/>).

6. Concluding remarks

Evaluation of clusters is an qualitative-quantitative approach and undertaken by various methods, by national ministries, quality certification authority or competent international bodies. At the national level are relevant quantitative analysis and qualitative analysis at cluster level.

Because in Romania the clusters are at growth stage were labeled bronze certificates seven clusters, which operates in the fields of IT&C, optical technology, agro-food processing industry, the furniture industry. All seven clusters were funded by grants from SOP IEC 2007-2013 (7 clusters) and the INTERREG IVC (1 cluster), and involvement in projects is a key factor in gaining international recognition.

Even if the label is a mark of quality bronze narrowly, obtaining this certification for several clusters with management performance in Romania represents an important step towards cluster management excellence, to getting silver label.

In this context, obtaining grants for cluster management is an essential element in path to achieve "levels of excellence" by management organizations.

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