



# Benchmarking of Management Excellence in The Agro-Industrial Sector in The Northwest Region of Romania

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## RESEARCH ARTICLE

### Abstract

Industrial clusters nowadays represent a large part of the growth of SMEs (companies), jobs, and specialized regions. Regional growth is influenced by innovative clusters, which facilitate research, cost reduction, and new technical application. Clusters in the IT industry, renewable energy, furniture and agro-industry are popular in Romania's Northwest Region, with Cluj-Napoca being as the capital of gold clusters. The aim of the study was to examine the clustering strategy in Romania's northwestern region, Transylvanian Furniture Cluster, IT Transylvania Cluster, AgroTransylvania Cluster and TREC Transylvania Energy Cluster from the perspective of the Gold Label assessment. The study reveals that the four gold certified clusters share the following characteristics: a formal strategy, a specific strategy that addresses internationalization, innovation, research, development, and know-how, services primarily directed at members, international and transnational collaboration with multiple countries, and national and international funding support programs. The proposed recommendations and activities can contribute to improve each cluster's strategy.

**Keywords:** European policy, clustering strategy, benchmarking, innovation

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## INTRODUCTION

The European Commission has enthusiastically embraced the cluster concept, especially with regard to the implementation of regional policy and the development of the Lisbon agenda (Uyarra et al, 2012). In today's economy, clusters are a key driver of a country's competitiveness (Turkina et al 2018). The concept of interconnected cluster and competitiveness can be expressed through the conditions of cluster formation which are: geographical proximity, entrepreneurial culture, critical mass of companies and the strengthening of trust but also through competitive benefits, which are related to productivity, specialization, innovation, costs and cooperation (Karev et al, 2018). The concept of smart specialization provides structural changes in the activities of a region as a result of focusing on the uniqueness of an industry or types of economic activity. Thus, a long-term regional innovation policy is ensured (Kostygova et al, 2019). Regarding smart regional specialization, both European and national analyses, represented by the Association of Clusters in Romania, emphasize the importance of the agri-food and digital ecosystems. These are the only areas of intelligent specialization found in all development regions (Kramer, 2023). Clusters are

firmly on the European Union's political agenda as tools for encouraging industrial transformation and improving performance and company competitiveness (Stojčić et al, 2019). Three factors are used to evaluate a cluster's performance: innovation and worldwide competitiveness, cluster size, and achievement of goals (Sölvell et al, 2003). The recognition of the positive impact of clusters on regional economies, as well as the identification of market and systemic deficiencies that prevent their operation, justified the adoption of public measures to facilitate the creation and consolidation of clusters, accelerating their development and updating in the different stages of their evolution (since each stage requires personalized strategies) (Csaba and Zombori, 2014). The regions that handle the economic complexity of the clustering process are typically the ones that gain from increased economic resilience and employment growth.

The cluster becomes a center piece for investment capital, influencing the formulation of investment strategies among the cluster's member companies. Enterprises construct investment portfolios in the direction of sources of attraction or investments of these funds as part of their investment strategy (Lisnichuk et al, 2018). According to Descrochers and Sautet, the regional specialization strategy commonly associated with clusters makes regions more economically viable, limits the spontaneous formation of inter-industry interconnections, and limits the emergence of new ideas and firms.

Competitive clusters, according to Porter, are defined not by member firms' co-location, but by their true relationship and collaboration, and the goal of activating the cluster is to consolidate innovation, modernize resources (infrastructure and labor), support local suppliers, strengthen market local / customer relations, and collaborate with educational institutions (Woodward et al, 2009). Smart specialization is a concept that proposes structural changes in a region's operations as a result of focusing on the uniqueness of an industry or type of economic activity. As a result, a long-term regional innovation strategy is assured (Kostygova, L et al, 2019).

According to the data of the Association of Clusters in Romania, in recent years a positive and extremely encouraging development has been observed regarding the role and importance of clusters in Romania's industrial policy (Coșniță et al, 2024). In Romania's northwestern region, the Ministry of Economy has registered more clusters in several categories of operation, including furniture, agriculture, creative industries, information technology, and renewable energy. This region is notable for its high-level clusters at both the national and international levels. As a result, the region has four gold medals Figure 1. Its position at the regional level is strategic in terms of pooling regional innovation potential, as well as providing skills, know-how, support for start-ups and SMEs, and innovation programs. Cluj-Napoca is even known as the "gold cluster capital" (Neamțu et al, 2019).

## **MATERIALS AND METHODS**

The main purpose of the research is to identify the key points of cluster management quality for the 4 clusters of the North West region of Romania that are gold certified in comparison with the smart specialization strategy of the North West Region for the period 2021-2027. As materials used, research included the analysis of the cluster policies of the European Union, the study of instruments that support the development of clusters, Romanian clusters, gold audit reports for the Transylvania Furniture Cluster, the Transylvania IT Cluster, the AgroTransylvania Cluster and the TREC Transylvania Energy Cluster. As research methods, the analyzes were carried out using the European Cluster Collaboration Platform (ECCP), the data of the Cluster Labeling Structure (EUCLES), the data of the European Secretariat for the Analysis of Excellent European Clusters (ESCA), the data of the Romanian Cluster Association and the Industrial Strategy of Romania 2023 -2027. As research methods, analyzes were performed using the European Cluster Collaboration Platform (ECCP), European Secretariat for Cluster Analysis (ESCA) data and the smart specialization strategy for the North West Region in 2021-2027.

## **RESULTS AND DISCUSSIONS**

Excellence in cluster management is the most basic tool for evaluating the performance of a cluster, as it encompasses all factors necessary for cluster sustainability (cluster maturity, cluster structure, typology, governance and cooperation, financing, strategy, objectives and services, but also achievements). Strategy is fundamentally straightforward. It should include information about where we want to go (vision, mission, ambition, ideal position) as well as how we plan to get there (the focus areas, strategic pillars and roadmap).

The gold clusters' four-point strategy consists in: services targeted primarily at members, internationalization, know-how but also national and international funding support programs Figure 2.

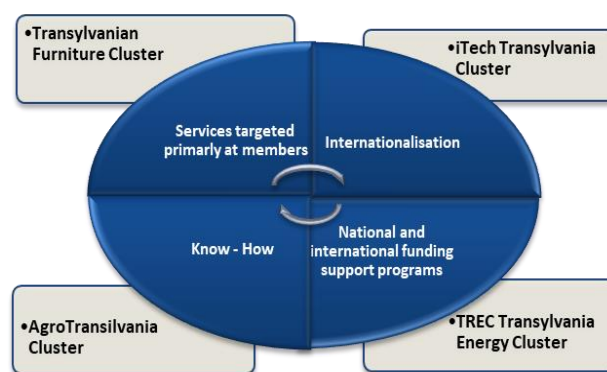
The label of "excellent cluster" is awarded to the cluster that ranks first among a country's many clusters. The goal, according to ECEI (European Cluster Excellence Initiative), is to establish independent, voluntary evidence of cluster management excellence that is recognized and recognized throughout Europe and beyond (Lämmer-Gamp et al, 2011). At the same time, "mutual learning" and "mutual evaluation" are addressed to cluster managers in order for them to participate in an improvement process and improve by learning from and comparing themselves to the best (Lämmer-Gamp et al 2014).

Innovation clusters influence regional growth by facilitating the implementation of innovation, cost reduction and the application of modern technologies (Găenescu et al, 2019).

The need to improve the economic efficiency of regional agro-industrial complexes raises challenges regarding the choice of a competitive model of the economy to maximize the available potential and the principles of clusters that have proven their effectiveness around the world can be the optimal solution to this problem (Chebokchinova et al, 2020). The positioning of agro-industrial clusters is influenced by criteria such as: the large number of personnel, above-average performance indicators, engagement in technological, innovative, logistic and international activities, but also the high level of planning and strategic management (Huseynov et al, 2024).



**Figure 1.** Gold clusters from the NW Region of Romania  
Source: Own determination



**Figure 2.** The gold clusters' four-point strategy  
Source: Own determination.

A comprehensive cluster plan should include ambition, target areas, value impact and a roadmap for a cluster. The four gold clusters took into account the recommendations of ESCA experts regarding the updating of development strategies, so that this process is carried out at least once every 2 years. Regardless of the cluster's field of activity, most of the indicators that have not reached the maximum quality refer to the qualification of the members of the long-term management team, the delimitation of private and public revenues, the attention paid to the monitoring of management performance, the evaluation of the satisfaction of members and customers, as well as the development of internationalization Table 1.

The 4 cluster initiatives are well integrated in the cluster landscape in Romania, as well as in European activities. Internally, among the dedicated partnership, the triple helix is well represented.

The table provides an overview of the assessment results for the 4 clusters that are labeled as excellent in cluster management. Indicators highlighted with "Green" reflect excellent performance, while those marked with "Yellow" indicate good performance with potential to improve.





### I. Cluster representativeness

Regarding the analysis of the GOLD indicators regarding the representativeness of the cluster, the similarity of the 4 clusters from different sectors is noted due to the economic and social environment in which they developed. The Development Agency of North-West Romania has encouraged the creation and development of cluster-type collaborative initiatives at the national level, in the form of the cluster concept, in various fields such as ICT (Information and Communication Technology), furniture, renewable energies, agro-industrial, tourism, geothermal, industries creative, materials and advanced technologies. The establishment of the clusters (the field of ICT, furniture and renewable energies) was supported by The Development Agency of North-West, the attraction of non-refundable funds and the implementation of the first projects of the clusters in the first stage was part of the Regional Innovation Strategy of the NW region for the period 2007-2013.

Importantly, it is the fact that most of the clusters in Romania, in the last decade, followed the classic triple-helix and later quadruple helix model, where the association of companies includes public institutions, research and education entities as well as various actors that include civil society. 4. From the point of view of the geographical concentration of the 4 clusters, the territorial representativeness is predominant in one of the regional development poles of the region in Cluj County, the North-West region being framed according to EUROSTAT, as a third-level Nomenclature of Territorial Units for Statistic (NUTS 3).

So, according to the green indicator obtained by all 4 clusters, the following similarities can be interpreted: the active participation of at least 80% of the total number of members, the composition of the cluster participants is of the quadruple helix type, and the regional development pole is Cluj County.

**Table 1.** ESCA indicators regarding the evaluation of cluster management excellence

No. Road sign	ESCA indicator name				
<b>I. Cluster representativeness</b>					
1	Involvement within the cluster	Green	Green	Green	Green
2	Composition of cluster participants	Green	Green	Green	Green
3	Number of participants involved in the cluster in total	Green	Green	Green	Green
4	Geographical concentration of cluster participants	Green	Green	Green	Green
<b>II. Typology, governance, cooperation</b>					
5	Maturity of cluster management	Green	Green	Green	Green
6	Human resources available for cluster management	Green	Green	Green	Yellow
7	Qualification of the cluster management team	Green	Green	Yellow	Green
8	Lifelong learning aspects for management team cluster	Green	Yellow	Green	Green
9	The stability and continuity of the human resources of the management team	Green	Green	Green	Green
10	Establishing participation within the cluster	Green	Green	Green	Green
11	Clarity of roles - Stakeholder involvement in decision-making processes	Green	Green	Green	Green
12	Direct personal contacts between the cluster management team and cluster participants	Green	Green	Green	Green
13	The degree of cooperation within the cluster	Green	Yellow	Green	Green
14	Integrating the cluster into the innovation system	Green	Green	Green	Green
<b>III. Financing</b>					
15	Perspectives of the financial resources of the cluster	Green	Green	Green	Green
16	Share of financial resources from private sources	Green	Yellow	Green	Green
<b>IV. Strategy, objectives, services</b>					
17	The strategy building process	Green	Green	Green	Green
18	Cluster strategy documentation	Green	Green	Green	Green
19	Implementation plan	Green	Green	Green	Green
20	Financial control system	Green	Green	Yellow	Green
21	Review of the cluster strategy and implementation plan	Green	Green	Green	Green
22	Monitoring cluster management performance	Green	Green	Yellow	Green
23	Focus on cluster strategy	Green	Green	Yellow	Green
24	Cluster management activities and services	Green	Green	Yellow	Green
25	Cluster management performance	Yellow	Green	Green	Yellow
26	Working groups	Green	Green	Green	Green
27	Cluster communication	Green	Green	Green	Green
28	Presence of the cluster in the online environment	Green	Green	Green	Yellow
<b>V. Achievements, recognition</b>					
29	Recognition of the cluster in publications, press, mass media	Yellow	Green	Yellow	Green
30	Success stories	Green	Green	Yellow	Green
31	Assessing the satisfaction of cluster participants and clients	Yellow	Green	Green	Yellow

Source: Own determination

## II. Typology, governance, cooperation

The degree of cooperation within the clusters is defined by the field of intelligent specialization in which they operate as well as by joint research projects (Industry and Research and Development). In this sense, the Consortium of Clusters from Northern Transylvania Cluster (Transylvanian Furniture Cluster, Transylvania IT Cluster and AgroTransilvania Cluster) was established in 2015, with the aim of contributing to the development of an environment conducive to collaboration between the economic, research and public, by co-organizing large-scale events such as matchmaking events and collaborative projects. The agro-industrial logistics cluster is traditionally considered a means of increasing the competitiveness of a region (Borisova et al, 2018).

With an impressive portfolio of projects and initiatives, the clustering pole of the North-West region stands out for the following: 1.The "Learn 2 do entrepreneurship" project (2016), 2.The partnership formed by the Transylvanian furniture cluster, Transylvania IT Cluster and AgroTransilvania Cluster within the project entitled 8 x S3 = SMART ROMANIA (2018) and 3. An impressive result of the collaboration at the level of the best-performing clusters in the North-West region is the Transylvania.

Digital Innovation Hub (DIH), a Digital Innovation Center that represents one of the key elements of the DEI (Digitizing European Industry) strategy. This type of structure offers assistance to companies (SMEs, start-ups) with the aim of becoming more competitive by adopting the latest digital technologies (Kalpaka et al, 2020).

According to the green indicator obtained for the 4 clusters, the following similarities can be interpreted: the maturity of the cluster management over 10 years, the number of employees compared to the number of members, the theoretical and practical skills/knowledge needed in the organization's activity, programs and budgets for the professional training of to the management team, previous professional experience, active participation of members in the last 24 months (withdrawal of members 50%), clarity of roles - Involvement of stakeholders in the decision-making processes through the General Meeting of the Associations, the Board of Directors, the management team, Direct personal contacts between the cluster management team and the participants within the cluster through monthly/quarterly/annual meetings, The degree of cooperation within the cluster which must have the active participation of at least 80% of the total number of members and the integration in the Domain of intelligent specialization, projects of joint research (industry and Research, Development and Innovation).

The analysis of the indicator shows the discrepancies between the 4 clusters from the perspective of the activity sector. Thus, Transylvania IT Cluster, operating in the IT sector, staff fluctuation is present for the indicator "Lifelong learning aspects for the cluster of the management team". Likewise for the degree of cooperation within the cluster where, according to the yellow indicator, participation is 15-30% of members in various partnerships (joint research projects).

Transylvania IT Cluster will implement, according to ESCA's recommendations, a methodology for evaluating the entire degree of cooperation between cluster participants, through various activities, working groups, joint projects, events, etc. Also, Transylvania IT cluster will ensure that each member of the management team participates in a regular annual training.

AgroTransilvania Cluster, according to the yellow indicator for the "qualification of the cluster management team" due to the agro-industrial field where it operates, the available human resources do not reach the sector-specific qualification. In line with ESCA's recommendations, moving to a new approach of hiring staff independent of specific funded projects, but paid by the association to develop the "business" of the cluster initiative. For example, membership fees or specific services within research laboratories should be the sources of income that could be used for this purpose. It seems quite unlikely that staff with industry experience can be hired, particularly staff with experience in marketing, sales and general business development in the priority target foreign countries, where the approach to contracting staff is based on part-time work and it is very specific to each project for the entire staff. AgroTransilvania Cluster took ESCA's recommendations into account and hired qualified staff - innovation services.

Due to TREC's field of activity, it gets the yellow indicator at "Human resources available for cluster management", because it is a specialized renewable energy sector. The recommendation for a cluster striving for gold in cluster management excellence is that the cluster needs a solid team directly involved in all cluster management activities, ensuring constant and solid relationships with all engaged participants. The action undertaken to improve the indicator consists in hiring a person to maintain these connections.

### **III. Financing**

All 4 GOLD certified clusters have in common the opportunities for public financing and the initiation of development projects in the field in which they operate. Regardless of the clusters' field of activity, the delimitation of private and public revenues is an indicator that has not reached the maximum quality. Due to the sector of activity in which it operates and the role assumed in the national and international ecosystem as well as the cluster management approach, the cluster's financial perspectives are different. From the European perspective, in order to reach the maximum quality indicator, each active cluster must have secured the budget for a period of 2 years in a percentage of at least 20% from own sources.

According to the analysis, the yellow indicator appears at Transylvania IT Cluster, ESCA's recommendation being the realization of a separate report regarding the management of private and public sources of income, by the accounting department.

### **IV. Strategy, objectives, services**

The similarities of the 4 clusters are found in the process of building the strategy involving the ESCA methodology, RIS3 NV, the documentation of the cluster strategy involving the regional, national and international industry/market, the value chain of the industrial/technological sector, Benchmarking, related strategies, annual planning of cluster development activities, accounting tools for financial control system, review of cluster strategy and implementation plan that is done 2 years apart, cluster management performance monitoring through gold label, ISO 9001, ISO 45001, RS 8000 or other specific certifications of the activity sector, continuous development of the cluster/clustering pole, regional promoter, improvement of innovation capabilities, Internationalization, cluster management performance by holding the gold label, working groups through the Cluster Consortium of the

NV Region, Smart Transylvania, cluster communication through ECCP, Consortium of Clusters from the North West Region, international partnerships, Matchmaking and the presence of the cluster in the online environment. Transylvania IT Cluster is the only cluster that holds the green indicator, representing the best performing level for the cluster's strategy, objectives and services. For example, he is involved in many research-development and innovation projects of Transylvania IT Cluster.

According to the yellow indicator obtained for cluster management performance by Transylvanian furniture cluster, the CMT cluster performance monitoring system is limited and the results are measured at the level of projects that achieve results. The weak point of the monitoring system consists in the fact that it covers only the performances at the production level and does not allow a measurement of the economic effects that are caused by the management of the cluster. The actions undertaken to improve the indicator consisted in the use of 3 digital platforms for carrying out cluster activities, these being the following: the E-learning platform, the AIDA platform and the eventtransylvanianclusters.ro platform. The website was also updated. The CRM system was implemented, the CMT cluster performance monitoring system was successfully implemented.

Research-development and innovation projects of the Transylvanian furniture cluster " Transylvanian furniture cluster -Innovative Cluster of European interest, financed by POC 2014-2020", investment projects (the integrated package of projects financed by the competitiveness pole " Transylvanian furniture cluster -POSCCE operation 131-Development of support structures for businesses of national and international interest-Competitiveness Poles), "soft" type projects (Management of the Competitiveness Pole, Transylvanian furniture cluster).

AgroTransilvania Cluster does not reach the green indicator because for all areas of activity, which the cluster manages (business units), facilitating a network of interested parties, operating laboratories and offering services related to taxes, commercial affairs, individual consulting, objectives must be formulated and KPIs. In addition, to further develop the existing monitoring system at group level, clearly stating the deadlines and responsibilities for each planned activity. Regarding the action taken to improve the indicator, the development strategy of AgroTransilvania Cluster was updated in 2020, being formulated for each activity unit objectives, results, activities and performance indicators. Also, the cluster strategy is updated every two years through member surveys and information dissemination meetings.

TREC gets the yellow indicator because for monitoring management performance it should be a system that is based on the "logic framework methodology" that links strategic objectives to activities and indicators for measurement, clearly stating the periods and responsibilities for each planned activity. The management of the cluster can make the necessary decisions to lead the organization and achieve the goals by the end of the year, only by knowing enough time about the degree of fulfillment of the planned indicators. The action taken to improve the indicator consists in drawing up an implementation plan with terms and objectives due in time. A clear agenda with concrete objectives should be established for each working group. A careful monitoring of the results, regular meetings with reports to the cluster management team and to the other members, should turn all working groups into powerful tools of added value for the long-term development and sustainability of the cluster. Clear results of working group activities should be properly documented to underline their sustainability. The action undertaken to improve the indicator: drawing up an agenda for working groups with objectives/results for each working group and reporting twice a year to all members of the cluster. Following experts' recommendations to devote more resources and attention to communication and internal network activities, the TREC Cluster will update its website more often, disseminating more its services and activities.

## **V. Achievements, recognition**

Regarding the indicators aimed at achievements, recognition of the cluster in publications, press, media, for the color green it is necessary to reach a target of at least 30 regional or national articles and 10 international articles] in the last 12 months. In this chapter, yellow predominates in most of the 4 clusters due to the fact that involvement in different specific projects usually requires a certain type of human resources, budget, activities or duration of implementation.

Although the success stories were solid, their success was at the level of individual SMEs or individual projects rather than the success of the cluster management team and activities as a whole. The cluster management team is advised to continue actions and activities with impact on the majority of cluster members. Proper documentation with clear results is recommended, leading to strong success stories. In this sense, documents will be created with all the activities undertaken for the members, trying to meet their needs as much as possible. Among the success stories, most of the 4 clusters have successful projects and examples such as: " Transylvanian furniture cluster - POSCCE operation 131-Development of support structures for businesses of national and international interest-Competitiveness Poles", "soft" type projects (Management of the Competitiveness Pole, Transylvanian furniture cluster), ITECH Transylvania, "The Agrotransilvania Cluster-Cluster innovative project specialized in the field of bioeconomy", "Innovative Cluster for Advanced Pilot Technologies in Alternative Energies-CITATION-E" etc.

Regarding the satisfaction of cluster participants and clients, the questionnaire found in all 4 clusters should also include a more detailed analysis of the needs of the cluster organizations and how these needs can be addressed

through more services or other services. This should also cover an analysis of the willingness of group participants to pay for services.

## CONCLUSIONS

The EU's clustering policy aims to foster economic growth, competitiveness, and innovation by supporting cluster development. In Romania's North West Region, the gold-certified clusters exhibit similarities such as innovative management, research-driven development, network creation, and specialization in smart fields. These clusters collaborate extensively within the region and beyond, contributing to industry development and integration into national and international innovation systems. While similarities are expected due to the regional context, differences arise in their roles, sectors, involved actors, and management approaches. Agro-industrial clusters in Romania enhance competitiveness and innovation in the agricultural and food sector, crucial for sustainable development and international market promotion. A strong management team is essential for navigating business challenges and steering the organization towards innovation, growth, and long-term sustainability.

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## Conflicts of Interest

The authors declare that they do not have any conflict of interest.

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