PhD THESIS

Studies on the excellence of cluster management in the agro-industrial sector in the Northwest Region of Romania

(SUMMARY OF PhD THESIS))

PhD student **Florina Deiac (Bârdea)**

Scientific coordinator **Prof.Univ.Dr. Felix Horațiu Arion**

INTRODUCTION

Recently, the process of clustering has become increasingly important, generating increased interest in research that analyzes cluster formation initiatives. Both national and international best practice models highlight the role of clusters in regional, national and European policies, aiming to contribute to the continuous development of nations. Industrial clusters have the role of being strong catalysts of value chains, and the experience of European clusters demonstrates their importance in implementing smart specialization strategies at the regional level.

The results of studies on cluster management team excellence can provide a deeper understanding of how these teams have been optimized to support economic development and innovation in a given region or field. Europe recognizes the excellence of the management team as a fundamental pillar of success in business and in the general economic context. In agro-industrial clusters, an excellent management team is vital for promoting innovation, increasing competitiveness and sustainable development of the sector. By implementing effective management and coordination strategies, such a team contributes to increasing productivity and efficiency in all stages of the agro-industrial production chain. The management team facilitates collaboration between manufacturers, processing companies, research institutions, universities and administrations, thus promoting innovation and research in the field.

PURPOSE AND OBJECTIVES OF THE RESEARCH

The general objective of the research is represented by the evaluation of the excellence of the management team in the agri-food sector in Romania.

To achieve the main objective, four interrelated specific objectives were pursued, the fulfillment of which led to the achievement of the main objective: OS 1. Identification of the specific requirements for the excellence of the management team. It looks at how Europe recognizes the excellence of the management team as a fundamental pillar of success in business and in the general economic context. OS 2. Evaluation of the analysis methodology of the criteria for evaluating the excellence of cluster management. The analysis of the certification methodology was carried out by referring to the national realities and those specific to the agro-industrial sector. OS 3. Cluster management excellence study. The benchmarking of cluster management excellence in the Northwest Region of Romania was pursued. OS 4. Analysis of the agro-industrial sector in the North-West Region of Romania. A study dedicated to the impact of the management excellence of the cluster in the agri-food field was carried out by studying the results obtained by the cluster in the field in the Northwest Region of Romania.

STRUCTURE OF THE DOCTORAL THESIS

The thesis is structured in two parts, comprising 9 chapters, has 149 pages, 3 appendices and 164 references.

PART ONE: Current state of knowledge

Chapter 1. Contains documented information on the conceptual approaches to the notion of cluster and includes 4 subchapters that address the conceptual aspects of the notion of cluster, the evolution and typology of clusters, the consolidation of the clustering phenomenon and the development pillars of the cluster.

Chapter 2. Addresses clustering policy in the EU, being structured on 4 sub-chapters, where cluster policy approaches are documented, the role of clusters in the cohesion policy of the European Union, the role of entrepreneurship support policy through the prism of clusters, as well as the importance of the policy of supporting research and development.

Chapter 3 presents European cluster management excellence in agri-food and is structured in two sub-chapters presenting the methodology for evaluating excellence in cluster policy and the ECEI labels on cluster management excellence (ESCA).

PART TWO: PERSONAL CONTRIBUTION

In this part, the materials and methods that were the basis of the research, the results, the conclusions and the recommendations aimed at achieving the proposed objectives are described.

Chapter 4 presents the specific objectives of the research.

Chapter 5. The specificity of the research considers the analysis of the agri-food sector through the prism of cluster excellence. Regarding this chapter, the situation of agro-industrial clusters in Romania was analyzed.

Chapter 6. Material and Method is essential for understanding the basis of the research method used to obtain the results and conclusions of the study. The structure of this chapter includes two main subchapters: the study material and the research methodology. The study material includes a detailed analysis of the region and context in which the research is conducted. It is structured in three subchapters: 6.1.1. The Northwest Development Region of Romania (presents the geographical and economic context, demography and workforce, dominant economic sectors), 6.1.2. RIS 3 Strategy for the North-West Development Region of Romania (RIS3 objectives and priorities, relevant projects and initiatives) and 6.1.3. Development clusters in the Northwest Region of Romania (definition and importance of clusters, identification of clusters in the region, performance and impact of clusters). The research methodology details the procedures and techniques used to collect and analyze data relevant to the study. This

subchapter is divided into three main parts: 6.2.1. Study of information sources (primary and secondary sources, source selection criteria, data collection tools), 6.2.2 Methodology specific to cluster excellence (excellence indicators, evaluation methods, evaluation procedures) and 6.2.3. Benchmarking (the concept of benchmarking, methods and application of benchmarking in the study). At the beginning of 2024, the Directorate of Industrial Policies and Competitiveness within the Romanian Ministry of Economy, responsible for the development of clusters as part of the industrial policy, registers 78 cluster initiatives. The landscape of clusters in Romania can be summarized as follows: 78 Cluster Initiatives registered with the Ministry of Economy, 53 Members of CLUSTERO (including 2 from the Republic of Moldova) (COȘNIȚĂ, 2024), 41 Clusters labeled with bronze ESCA, 12 Clusters labeled with silver ESCA, 7 Clusters labeled with Gold, out of the 78 being 12 clusters in the agro-industrial field. The certifications held following the ESCA audit attest to excellence in cluster management. A remarkable aspect of the NW Development Region of Romania is the high level of performance of the clusters at national and international level, the region being honored with 4 certified labels with the gold label. Among the 4 clusters with the highest European certification in cluster management are: AgroTransilvania Cluster, Transilvan Furniture Cluster, IT Transilvania Cluster and TREC Cluster. The benchmarking of the gold clusters in the Northwest Region of Romania is an essential process for evaluating and improving the performance of these organizations.

Table 19. SWOT analysis of gold clusters in the NW region of Romania

Strong points	Weaknesses
✓ **Expertise and specialization:** Clusters have been recognized for their expertise in a specific field, which makes them competitive in the domestic and foreign markets. ✓ **Collaboration and networking:** Clusters have a solid network of collaboration between its members, universities, research institutions and public authorities, facilitating the exchange of knowledge and innovation. ✓ **Access to financing:** Through the GOLD certified cluster status, there is access to financing and additional resources for development and	✓ **Dependence on key members:** If clusters depend too much on a few key members or a single dominant company, this can affect their stability and diversity. ✓ **Lack of financial resources:** The costs for maintaining GOLD certification and implementing projects can be high, and the lack of funding can hinder the development of clusters. ✓ **Internal competition:** Members of clusters may compete with each other for the same resources or markets, weakening the cooperation and collective effectiveness of

innovation projects. ✓ **International recognition:** Clusters are internationally recognized for their excellence and can benefit from opportunities for collaboration and expansion in foreign markets.	clusters.
Opportunities	**Threats**
✓ **Internal and external market growth:** There are opportunities to expand and penetrate national and international markets for the products and services offered by the clusters. ✓ **Partnerships and collaborations:** Clusters can explore new partnerships and collaborations with other similar or complementary entities, both nationally and internationally. ✓ **Innovation and emerging technologies:** Opportunities for the development and implementation of new and innovative technologies to support the competitiveness and sustainable growth of clusters.	✓ **Legislative and regulatory changes:** Unforeseen changes in legislation or government policies may have a negative impact on clusters and their activities. ✓ **External Competition:** Clusters may face stiff competition from similar clusters in other countries, which may offer similar products or services at more competitive prices or with higher quality. ✓ **Environmental and technological risks:** Risks related to climate change, outdated technologies or cyber vulnerabilities can affect the operations and reputation of clusters.

Chapter 7 is dedicated to the presentation and interpretation of the results obtained from the research. The structure of this chapter includes four main sub-chapters detailing the key aspects of the study as follows: 7.1. Studies on the perception of excellence of the cluster management team (key results), 7.2. Analysis of the criteria for estimating cluster management excellence (description of the estimated criteria for estimating management excellence, results), 7.3. Benchmarking of management excellence in the NW Region of Romania (the role of the Clustero Association, indicators and standards of excellence, comparison of gold clusters) and 7.4. Challenges regarding cluster excellence in the agri-food sector (presentation of AgroTransilvania Cluster context, performance and challenges, case study and recommendations). The chapter provides a detailed analysis of the research results, highlighting the key aspects of excellence in cluster management.

The research highlights the importance of adapting national and regional policies to support the development of clusters and contribute to economic growth and innovation in the agro-industrial sector. Government policies and financial support, economic maturity and infrastructure, culture of innovation and collaboration, access to markets and technologies and adaptability to change are the essential factors that determine the distribution of certified clusters in Europe. In countries with strong support policies for innovation and regional development, such as Germany and Denmark, superior cluster performance is recorded. In contrast, countries without such support, such as Luxembourg and Cyprus, failed to develop significant clusters.

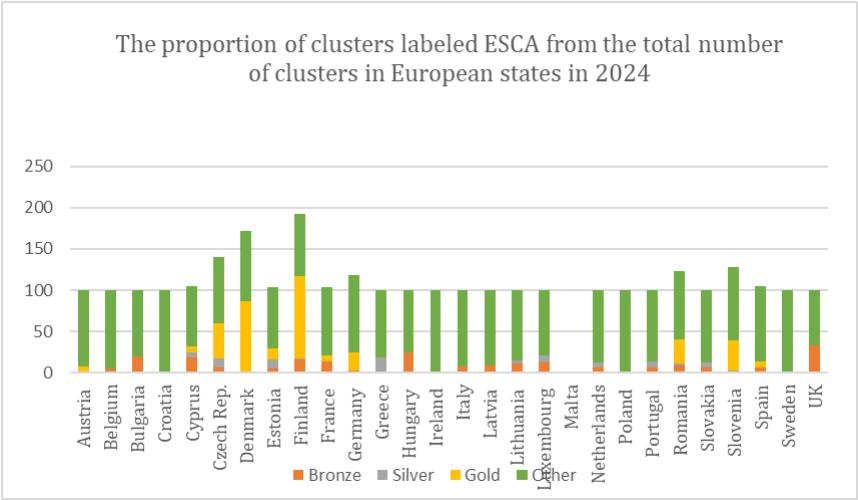

Fig.18 Share of clusters labeled ESCA in the period 2024
Source: Data processing https://www.cluster-analysis.org/

In the North-West Region of Romania, the regional support policies have contributed to a notable performance of the clusters, reflected by the presence of a considerable number of performing clusters. It can be seen that the agro-industrial sector is present in 6 out of the 8 regions of Romania, which denotes the potential of the region for the development of the agro-industrial sector. A positive and extremely encouraging development is observed regarding the role and importance of clusters in Romania's industrial policy.

In the agro-industrial sector in Romania, certain ESCA indicators regarding the certification of management excellence could be considered less relevant or could require adjustments to better reflect the realities and needs of this sector. Subchapter 7.2. analyzed and classified the ESCA indicators according to their relevance for the specific needs of the agro-industrial sector in the North-West Region of Romania, based on the feedback received from the cluster managers among the least relevant or requiring adjustments being: the involvement in cluster framework, geographical concentration of cluster participants, life-long learning aspects for the cluster of the management team, degree of cooperation within the cluster, integration of the cluster into the innovation system, online presence of the cluster and recognition of the cluster in publications, press , mass media. Subchapter 7.4 includes a high-quality pre-audit for the AgroTransilvania Cluster by adapting the ESCA methodology. Thus, the indicators were revised and adjusted to more concretely reflect the specificities of the agro-industrial sector.

Regarding the evaluation of the excellence of the management team in the agri-food sector in Romania, the identification and evaluation of existing management practices in the agri-food sector in Romania regarding efficiency, innovation and sustainability are essential. Analyzing the impact of management teams on the performance and competitiveness of companies in the agri-food sector, are also important aspects to obtain a comprehensive understanding of the situation, especially

in terms of revenue growth, expansion into new markets and product and process innovation.

It is necessary to identify the challenges and opportunities faced by management teams in the agri-food sector in Romania and propose recommendations and solutions to improve their performance and excellence.

AgroTransilvania Cluster is a clear example, that the performance of a cluster is demonstrated over time and only through quantifiable and achievable results. The impact on the North-West community in Romania and beyond, stands out through the collaboration networks in which it is involved and contributes to economic growth, job creation, improvement of industrial competitiveness, promotion of innovation and sustainable development.

By evaluating and highlighting achievements and recognition within the AgroTransilvania Cluster, the reputation and positive impact of the cluster in the agro-industrial industry and its community can be strengthened. These findings can also provide valuable guidance for identifying and capitalizing on future development and collaboration opportunities. The pre-evaluation of the AgroTransilvania Cluster provided a clear and detailed picture of the performance of the ATC, allowing the identification of concrete strategies for continuous improvement and development.

The differences between the current methodology (ESCA standard methodology) and the one proposed for the agro-industrial sector are significant, adapting to the specificities and needs of this sector.

Table 25 Differences between the standard ESCA methodology and the methodology proposed for the agro-industrial sector

No. crt.	The difference	ESCA standard methodology	The methodology proposed for the Agro-Industrial sector
1.	Relevant Indicators	It uses generic indicators, applicable in various industrial and service sectors.	It includes specific indicators for agriculture and the food industry, such as crop yields, the efficiency of the use of natural resources, the level of technology of agricultural processes and the degree of ecological sustainability.
2.	Measuring Economic Performance	It focuses on general economic indicators such as profitability, revenue growth and operating costs.	It adapts economic indicators to include specific elements such as the volatility of agricultural prices, the impact of subsidies and the costs associated with climate change.
3.	Sustainability and Ecological Impact	It addresses sustainability in a general way, without going into sector-specific details.	It includes specific sustainability indicators such as greenhouse gas emissions, pesticide and fertilizer use,

			and impact on biodiversity.
4.	Technology and Innovation	The assessment of technology and innovation is generic and does not focus on the needs of the agro-industrial sector.	It focuses on the use of advanced technologies in agriculture, such as precision agriculture, biotechnology and automation of agricultural processes.
5.	Infrastructure and Logistics	It evaluates infrastructure and logistics without taking into account the particularities of the sector.	It includes indicators related to specific infrastructure, such as storage capacity for agricultural products, supply chain efficiency and access to markets.
6.	Adaptability to Climate Change	It does not specifically focus on adaptation to climate change.	It assesses the adaptability of farms and processing units to climate change, including measures to protect against extreme weather events.
7.	Relations with the Community and Social Responsibility	It focuses on social responsibility in general terms.	It examines relationships with rural communities, the social impact of agricultural activities and community development initiatives.

Chapter 8. Presents the relevant conclusions and recommendations based on the analysis performed. The resulting discussions and interpretations help to understand the factors that contribute to the success of clusters and provide valuable information for their future development. Following the results of the AgroTransilvania Cluster analysis on improving cluster performance, we recommend the following:

- ❖ Ensuring representativeness and active involvement of members and stakeholders;
- ❖ Managing staff turnover through effective strategies;
- ❖ Diversification of funding sources to reduce dependence on grants;
- ❖ Evaluation and continuous development of strategy, objectives and services;
- ❖ Strengthening the recognition and achievements of the cluster.

Chapter 9. The originality and innovative contributions of the thesis, underlines the uniqueness and innovations brought by this research in the field of cluster management, especially in the agri-food sector in the Northwest Region of Romania. The aim is to highlight the original aspects of the study and to describe the significant contributions it makes to the literature and practices in the field.

- ➢ Practical application of the knowledge, information and skills obtained by promoting the training course organized by the European Secretariat for Cluster Analysis in 2019 - "Benchmarking Experts of Cluster Management Organizations".
- ➢ Basing the related information and techniques resulting from the

Coordination of the activity regarding the conduct of the GOLD audit in 2019 to obtain the excellence certification of the AgroTransilvania Cluster.

- Realization, substantiation and analysis of the results obtained through the Benchmarking of the GOLD clusters in the NW region of Romania.
- Elaboration and justification of the SWOT analysis of the gold clusters in the NW region of Romania.
- Realization, substantiation and analysis of the results obtained from pre-audit gold AgroTransilvania Cluster 2024.
- Arguing the data and methodologies associated with the results from the dialogue with the cluster managers.

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