



THE IMPORTANCE OF ECO-CLUSTERS IN THE CONSTANTA COUNTY

Mirela-Iuliana Sundri

¹Constanta Maritime University, Faculty of Naval Electro-Mechanics, 104 Mircea cel Batran Street, 900663, Constanta, Romania, e-mail address: iuliana.sundri@cmu-edu.eu

Abstract: Economic theory and international practice confirm the role of clusters as catalysts for competitiveness based on innovation and internationalization. Europe is facing the challenge of becoming a fair and prosperous society based on a modern, competitive and resource-efficient economy. Mobilizing industrial actors towards a clean and circular economy through in-depth cooperation along value chains as well as the use of new technologies, sustainable solutions and disruptive innovation are critical to achieving this goal. Clusters play an important role in operationalizing smart specialization strategies. Eco-clusters aim to increase the competitiveness of enterprises included in "cluster" structures in sectors of economic relevance, by concentrating resources and developing the production of innovative goods such as technologies, products, services, with the greatest possible reduction of waste. Constanta County, through its strategic positioning, through the concentration of economic activities, education and research is an area of maximum interest for the development of eco-innovation and eco-clusters. This study highlights the premises for the establishment of eco-clusters in the Constanta area, given their role as a driver in greening economic policies in the region and developing partnerships in order to obtain clean products. Through eco-clusters, there are also developments in the process of eco-innovation and implementation of sustainable development strategies in the Constanta area, as a means for a long-term socio-ecological transition.

Key words: Constanta County, eco-cluster, eco-innovation.

1. INTRODUCTION

It has been proven that, regardless of their field of activity or size, companies tend to become more efficient, more productive when they cooperate with each other [1], [2], [3], [4], [5], [6]. This finding seems to be the main motivation for the emergence of economic structures called clusters.

The clusters include enterprises and institutions from a certain geographical area interested in the same field of activity.

Over time, the efficiency of working within clusters, increasing the capacity to innovate and implement a common development strategy has been noted. Moreover, the potential of clusters to become an effective tool of development policy was highlighted, which led to the increase of interest in this direction both in academia and among economic policy makers. Clusters have successfully developed into examples of good practice in both large and smaller countries, regardless of their economic and cultural specifics. The beneficial effects of cluster development on competitiveness, productivity and growth are also recognized in European Union countries, and therefore more and more of these countries are concerned with

identifying and inventorying clusters, as well as developing policies to encourage and support them.

In the context of the current Covid 19 pandemic, in a very short time, clusters have proved effective in mobilizing industrial actors, RDI organizations and public authorities to find quick solutions to the challenges of the medical sector and the economy in general, both in Europe and at the national level.

Europe is facing the challenge of becoming a fair and prosperous society based on a modern, competitive and resource-efficient economy. In Europe, clusters play an important role in making smart specialization strategies operational. Romania's cluster policy has been, since 2009 and until now a component of industrial policy, neglecting non-industrial clusters.

Europe's future depends on a healthy planet. The current climate and environmental challenges require an urgent and ambitious response. The EU has committed to achieving climate neutrality by 2050 [7]. Reaching this goal will require a transformation of Europe's society and economy, which will need to be cost-effective, fair and socially balanced.

Sustainable development has become increasingly important due to the need for conservation and management of natural resources. On the other hand, global climate change and pollution are a wake-up call



for the use of technologies with the least impact on the environment.

In this context, eco-clusters represent a way to improve the innovation potential by concentrating the efforts of all representatives, a major challenge being the adaptation of environmental management practices at the cluster level, in a more holistic way.

In most studies conducted by industrial clusters, environmental issues focus on pollution control practices, which in fact represent measures to comply with legislation or environmental impact studies. These studies also did not take into account the mutually beneficial potential of clusters in terms of environmental protection, resource management and waste management.

The transition to innovative clean production technologies requires good collaboration between cluster members, based on trusting relationships obtained after a long experience and collaboration.

Industries in the same geographical area, which are usually separated, can be encouraged in an eco-cluster to make connections aimed at significantly reducing waste and thus a clean final production under this partnership.

3. PREMISES FOR ECO-CLUSTER SETTING UP IN THE CONSTANTA AREA

With a strong concentration of economic activities, Constanta County is one of the main economic poles of Romania. The Metropolitan Area of Constanta is an economic polarizer of the South-East region, approximately 1/3 of the number of small and medium enterprises in this region being registered here.

Due to its geographical position, at the eastern end of the European Union, Constanta County, located on the shores of the Black Sea, is a bridge between East and West - between North and South.

Transport is another aspect that must be taken into account in the development of eco-clusters. Transport systems have an overwhelming role in the socio-economic development of an area, with a direct impact on the daily lives of citizens and economic organizations. Constanta County has a high potential for the development of the transport system, being crossed by the Danube River, having access to the Black Sea and being relatively close to Bucharest.

The port of Constanta is located at the intersection of trade routes that connect the markets of European Central and Eastern countries, which have no access to the sea, with the Transcaucasian Zone, Central Asia and the Far East. It is the main Romanian port and is in the top 10 European ports. Favorable geographical position and the importance of the Port of Constanta is highlighted by the connection with two Pan-European Transport Corridors:

Corridor VII - Danube (river) and Corridor IV (road and railway). Near the Port of Constanta are located the two satellite ports Midia and Mangalia, which are part of the Romanian maritime port complex.

Regarding the location of Constanta on the shores of the Black Sea, opportunities for eco-networks in the Black Sea basin have been highlighted by other studies [8], [9]; in this regard, IAMU (International Association of Maritime Universities) member universities from the riparian country, through the experience obtained after long collaboration, can be a support in the realization of new partnerships [10].

Constanta is an important university and research center. The universities and research institutes from Constanta have the experience of partnerships in different fields of interest, the expertise of the staff representing a strong point in attracting these entities within an eco-cluster.

Cluster policy is a horizontal policy, involving a mix of policies and strategies, including innovation policy, regional development policy, SME and entrepreneurship policy, social policy, internationalization and export promotion, smart specialization strategies, attracting domestic and foreign investments, cross-border cooperation, etc. In Romania, too, clusters are recognized as one of the important tools for promoting industrial development, innovation, competitiveness and economic growth.

The Romanian Industrial Policy Document prepared by the Ministry of Economy (2018) highlights the role of clusters in 3 horizontal objectives:

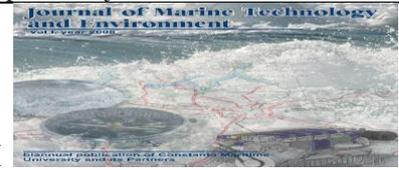
- The innovative cluster, an instrument of an intelligent economic policy;
- High share of Romanian links in global value chains;
- Smart and sustainable economic growth through innovation in industry.

In 2011, the Romanian Cluster Association was founded - CLUSTERO, with the role of promoting and representing clusters at national, European and international level.

At the end of 2019, CLUSTERO member clusters numbered 2,000 companies with 189,000 employees. At the level of these clusters, compared to 2013, there were increases between 40% in the case of exports and 162% in the case of research and development expenditures.

In the South-East region, of which Constanta County is part, there were, at the end of 2019, 8 clusters in fields such as ICT, shipbuilding, health, creative industries, renewable energy, 7 of the clusters, members of the Romanian Cluster Association, totaling 304 companies and over 28,000 employees.

The inconsistency of the support policy has been one of the main weaknesses of the cluster environment in Romania in recent years. Although the Ministry of Economy is the main actor responsible for cluster policy



as part of industrial policy, structural funds were only available under ERDF interventions in the 2014-2020 JOP. No support measures have also been envisaged in fulfilling the role of catalyst clusters of regional (eco) innovation and industrial systems [11]. This creates the image of a suboptimal situation whose continuation in the medium and long term is a threat that risks calling into question the remarkable results obtained by clusters so far.

Romania did not register good results in terms of eco-innovation performance with a ranking of 24th in EU countries and a score of 71 in the Eco-Innovation Index (September 2021) compared to 121, the average value for EU member countries [12].

Following the evolution of this score over the years, there is a decrease in its value starting with 2017 (Fig.1).

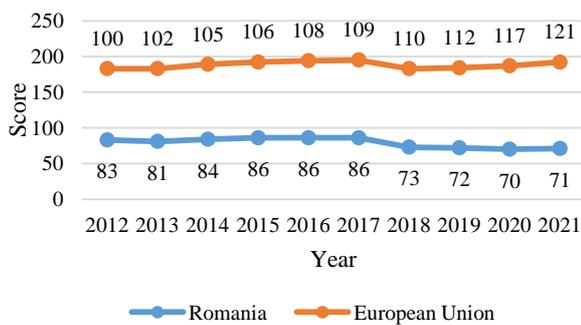


Figure 1 Eco-Innovation Index

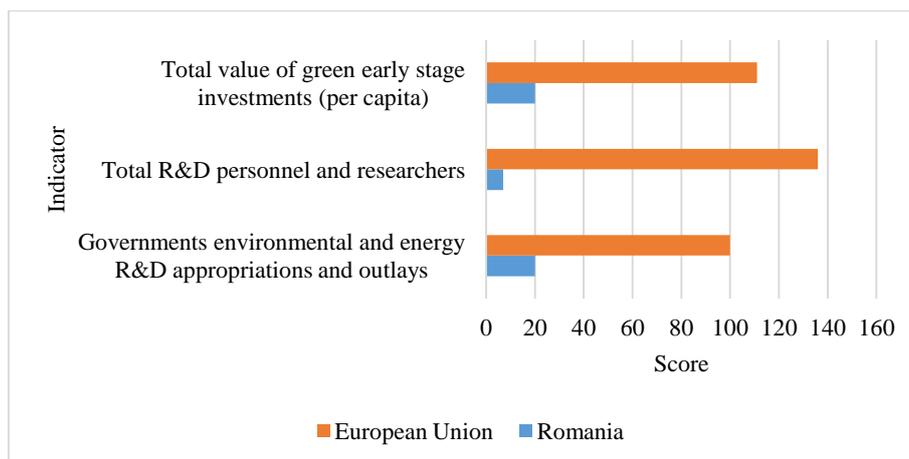


Figure 2 Indicators' score for Eco-innovation inputs

Source: https://ec.europa.eu/environment/ecoap/indicators/index_en

Eco-innovation index is based on 16 indicators grouped into 5 categories:

- eco-innovation inputs - where Romania ranks 26th with an average score of 16 compared to 113 the average score for EU member states. For the 3 indicators of this category, the score registered by Romania varies between 7 and 20 (Fig. 2).

- eco-innovation activities - at this dimension Romania ranks last in the EU, with a score of 34 compared to the value of 100 of the average score in the EU. The scores for the indicators characteristic of this category vary between 0 and 137 (Fig. 3). Note the score above the European average obtained for organizations that have implemented ISO 14001.

- eco-innovation outputs: Romania ranks 25th, with a score of 76 compared to 140 European average; for the 3 indicators taken into account in this category the scores represent 41% - 78% of the average scores of the EU countries (Fig 4)

- resource efficiency - Romania also ranks 25th out of 28 EU countries, with a score of 46 compared to 147 EU average score. The values of the 4 indicators taken into account in this section represent 10% - 94% compared to the European averages (Fig. 5).

- socio-economic outcomes - in this category Romania ranks 6th among EU countries, registering a score of 148 compared to 105 European average. At the export indicator of products from eco-industry, Romania ranks 3rd in Europe and 5th in terms of turnover in this segment (Fig. 6).

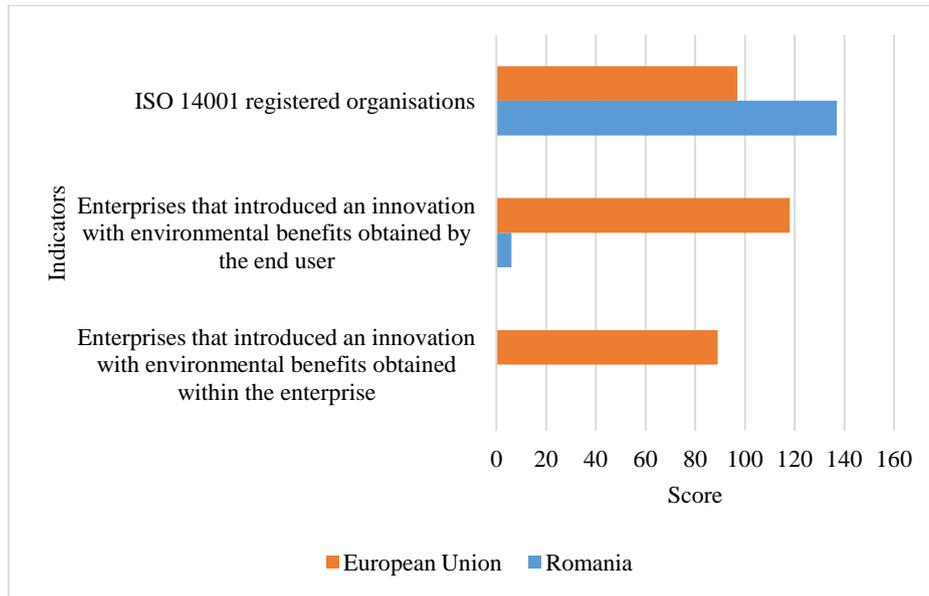
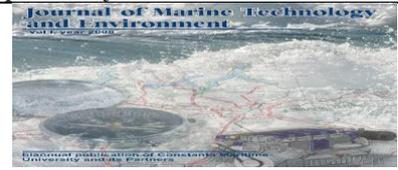


Figure 3 Indicators' score for Eco-innovation activities
Source: https://ec.europa.eu/environment/ecoap/indicators/index_en

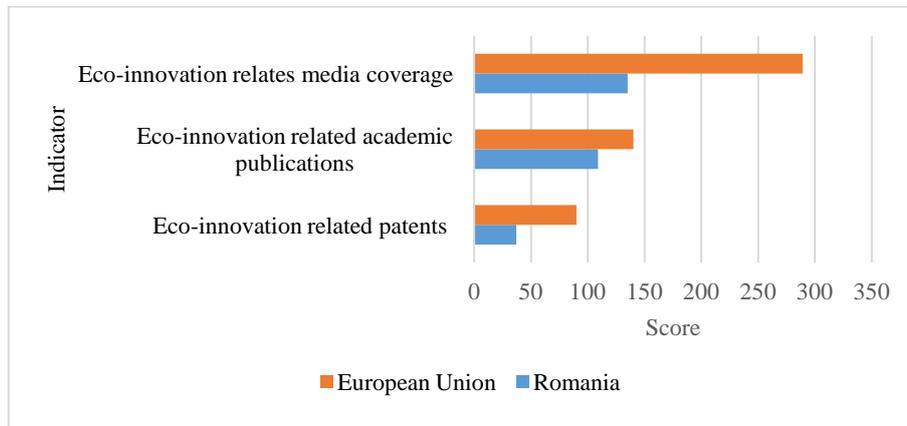


Figure 4 Indicators' score for Eco-innovation outputs
Source: https://ec.europa.eu/environment/ecoap/indicators/index_en

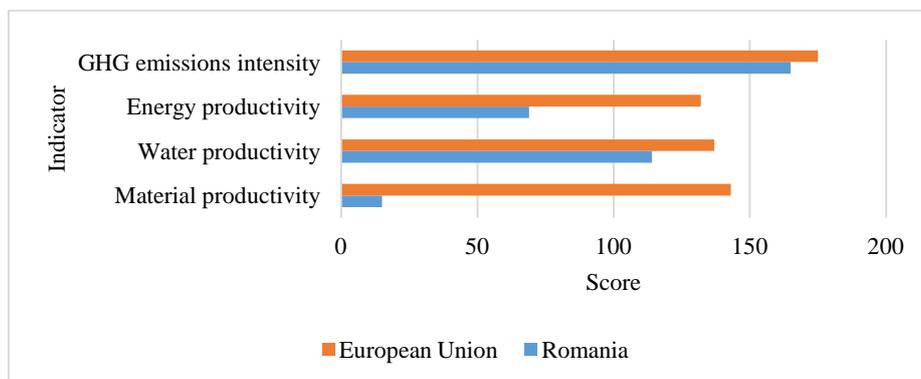


Figure 5 Indicators' score for Resource efficiency outcomes
Source: https://ec.europa.eu/environment/ecoap/indicators/index_en

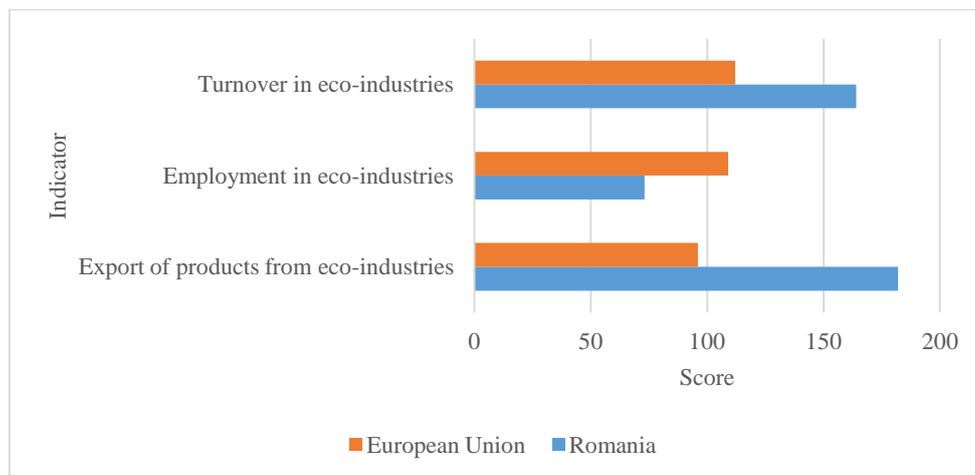


Figure 6 Indicators' score for Socio-economic outcomes
 Source: https://ec.europa.eu/environment/ecoap/indicators/index_en

Other threat rises to the level of clusters acting in traditional sectors (wood and furniture; textiles, agri-food sector). The competitive gap between Western and Eastern Europe is obvious, and traditional sectors need to become smart or disappear, with dramatic economic and social consequences.

The fields of wood and furniture, textiles and agri-food have an important role in the national economy and in that of Constanta County in terms of employment, contribution to GDP, exports, but are "low skilled - low tech" sectors, whose competitive advantage is based on the existence of production capacities and relatively low labor costs. From this point of view, a viable alternative is to integrate them into new industrial value chains in the field of cluster-based bio-economy. The development of these value chains must include measures to accelerate cross-sectoral and inter-regional relations in terms of knowledge transfer and the creation of a critical mass of enterprises to address their fragmentation.

The fact that the Constanta area has a great potential in different fields of activity, offers business opportunities and attracting European funds, especially in the field of eco-innovation and the association of different actors in the area in eco-clusters. Therefore, we consider it very important to develop at national level and implement at local level appropriate policies to create and stimulate efficient ways to finance this type of clusters, knowing that the adoption of the eco-innovation process requires time and high costs. This would be at the same time an efficient method of attracting foreign capital in clusters in the Constanta area.

The universities and research institutes from the countries included in the Black Sea Basin, which for Romania are located in Constanta, are potential members of an eco-cluster with a vast experience in identifying in partnership the problems and solutions in the region. Better awareness among the public and businesses about

sustainable development and the role of eco-innovation, along with local policies to help those interested, are starting points in the successful development of eco-clusters in this area. Existing work platforms and databases, including those for monitoring environmental impact factors, developed as a result of partnerships between universities and research institutes in the region, are a source for addressing and solving problems within eco-clusters.

Using eco (systems) as a model of operation, members of eco-clusters (companies, universities and research institutes, NGOs and public authorities) will develop optimal solutions for obtaining technologies, products and services in a closed loop in order to adapt to the circular economy.

5. CONCLUSIONS

The development of eco-clusters in Constanta County is supported by the existence of experienced clusters at European and international level as well as by their representative associations. The presence of local universities and research centers involved in environmental issues in the area is a support in the development of the eco-innovation process.

Developing an understanding of eco-innovation and identifying appropriate policies and mechanisms to encourage the adoption of eco-innovation, focusing on how to use eco-innovation as a method for innovation and the development of new green products, will lead to the sustainability of clusters in the area.

Implementing eco-innovation is a challenging process, and understanding the barriers and opportunities in each business and the main gaps in policy and education could help build a better understanding of the context and conditions for the development of eco-clusters in Constanta County.



7. REFERENCES

[1] Sukjin Yoon , Khalid Nadvi, 2018. Industrial clusters and industrial ecology: Building 'eco-collective efficiency' in a South Korean cluster. *Geoforum*, 90 (2018) 159-173, <https://doi.org/10.1016/j.geoforum.2018.01.013>

[2] Max Nathan, 2013, Agglomeration, clusters, and industrial policy, *Oxford Review of Economic Policy* 29(2): 383-494. DOI:10.1093/oxrep/grt019

[3] V. Prokhorova , T. U. Anopchenko, V. E. Chernikova. L. V. Goloshchapova, N. Kulikova, 2018. Formation and development of industrial clusters in the socioeconomic regional system. *Revista Espacio*, Vol. 39 (N°31) Year 2018. Page 25. ISSN 07981015.

[4] <https://royalsociety.org/-/media/policy/Publications/2020/2020-07-research-and-innovation-clusters-report.pdf>

[5] https://clustercollaboration.eu/sites/default/files/news_attachment/european_panorama_2020.pdf

[6] Gibbs, D and O'Neill, K, J., 2016. Future green economies and regional development: a research agenda. *Regional studies*, December, 2018. DOI: 10.1080/00343404.2016.1255719

[7] <https://www.consilium.europa.eu/en/policies/green-deal/>

[8] Memet, F., 2017. Steps in setting-up of two centers for marine renewables within a Romanian-Bulgarian cross-border cooperation, *Journal of Maritime Research*, Vol.14, No.3, ISSN: 1697-4040.

[9] Memet, F., 2017. Is there any link between beliefs and environmental issues within a green energy cluster? *European Journal of Science and Technology*, Vol 13, No. 1, 111-116.

[10] F Memet, I. Anton- 2018, The need of the establishment of a marine renewables network within an academic cooperation, doi: 10.1117/12.2322129, WOS: 000458717900098, ATOM- N, Constanta, Romania

[11] <http://clustero.eu/wp-content/uploads/2020/04/situatia-clusterelor-din-romania-aprilie-2020.pdf>

[12] https://ec.europa.eu/environment/ecoap/indicators/index_en