Analysis of the Advantages of Creating Border Clusters

Liudmila Rosca-Sadurschi[1], **Florin Buhociu**[2]

Abstract: In a changing environment and rapid globalization, competitiveness of a country or region depends increasingly more effective in innovation. The main challenge for research and innovation is to facilitate the networking of companies and research laboratories. These networks can take the form of a highly integrated cross-border economic group, but may consist of action to facilitate business linkages and inter-laboratory, or cross-border clusters. The creation of these clusters requires performing several conditions but bring significant benefits to all stakeholders.

Keywords: border cooperation; cluster; regional development

In a changing environment and rapid globalization, the competiveness of a country or a region depends increasingly on the innovation effectiveness with the involvement of both the public and private sector. This is the reason the European Union has implemented a series of initiatives to strengthen the potential of the entrepreneurs in research- development and innovation to consolidate the ties between the public research institutions and the academic environment.

Europe is characterized not only by its diverse culture and the tumultuous history of its peoples, but by the borders which separate, sometimes, regions and ethnic groups that share a common identity.

The barrier effect of national borders has been historically determined and has been intensified by the socio-economic, administrative, and military policies of the governments and has often disadvantaged the population living in the border area. The regional policy of the European Union has accelerated the cross border cooperation, helping the border regions to overcome its divergences and to find ways to communicate and collaborate in all the domains related to the life of the local people.

In this regard, the euro-regions have became a modern way of cross border cooperation through which the local government institutions work to attain common objectives,

[1] Senior Lecturer, PhD, Cahul State University ŖB.P. Hasdeuŗ, Cahul, Moldova. Address: 1 Piaţa Independenţei, Cahul, Republic of Moldova, Tel.: 0299 22481, Fax: 0 299 24752. Corresponding author: liudmila.sadurschi@gmail.com.
[2] Professor, PhD, University "Dunărea de Jos" Galati, Romania. Address: 111 Domneasca Street, 800215, Galati, Romania. E-mail: florin.buhociu@ugal.ro.

such as the economical and socio-cultural development, the identification and attraction of sources of investment, the increase in the mobility of human and financial resources, and ,most recently, the diminishment of regional conflicts.[1]

Talking about the euro-regions that the Republic of Moldova is a part of, and namely Upper Prut (Romania, Moldova, Ukraine), Lower Danube (Ukraine, Moldova, Romania), and Siret- Prut- Nistru (Romania- Moldova), they have been established to strengthen the capacity of cooperation within a series of cross-border projects related to:

- the adjustment of the common infrastructure channels and the refurbishing of the premises;
- the improvement of the social and common sector;
- the diversification of the local economy and the support of the entrepreneurship;
- the development of the cross-border tourism;
- the protection of the environment.

During the last couple of years, some other efforts have been made towards cross-border cooperation and new structures have been established. Such examples are the *Council for Cooperation for Border Regions Pskov-Aluksne- Voru* (The Russian Federation, Lithuania, Estonia), which aims to become an euro-region structure.; the euro-region *Country of Lakes Ezeru-Zeme* (Latvia- Belarus).

For the moment, not all the euro-regions have the necessary structures in terms of their legislative organization as well as regarding their funding and other organizational aspects.

Nevertheless, the experience of the euro-regions and work communities from the EU countries has been, and this is an important thing to be mentioned- a source of inspiration for the formation of new structures and for the launch of the cross-border cooperation process (Roşcovan; Bulat; Puntea & Miron, 2010).

Once the potential for cross-border cooperation has been identified, the main challenge for research and innovation is to facilitate the creation of a network of companies and research laboratories. This network can be either a cross-border cluster for a well-integrated economic "canvas", or can take form of the traditional efforts to facilitate cooperation relationships among enterprises or laboratories.

What the local authorities can do is to identify ways to facilitate the networks (clusters), and to create the necessary conditions to energize, empower, and allow these networks overcome the challenges that could appear such as the costs, for example, so as to facilitate the involvement of the interested parties to work in cross-border networks. They can also work on changing attitudes from the one of

[1] http://www.innovation.public.lu/fr/clusters/index.html.

mistrust to getting to know each other better. This will lead to a better analysis of the legal framework, will allow to easier overcome administrative and language barriers. Other important aspects are the identification and extension of the common potential in the field of research and innovation, the supply of information and assistance regarding the opportunities and the procedures of application to cross-border projects (INTERREG)[1].

These types of projects have the objectives to increase the competitiveness of the cross-border regions among the EU countries as well as the countries which are not part of the European Union. The main objective of European regional cooperation (ERC) is to promote a harmonious economic, social, and regional development of the Union as a whole. Interreg is based on three main components of the cross-border cooperation: (INTERREG A), transnational (INTERREG B), and interregional (INTERREG C). One of the main conditions of these projects is the collaboration and common participation in all the domains: research, funding, and human resources. The main priorities of these projects are: research and innovation, informational and communication technologies, the competitiveness of the SMEs; an economy with a reduced amount of carbon dioxide emissions; the fight with climate change, the efficiency of the available resources and the environment, transportation, social inclusion, availability and mobility of jobs, better education and training, and a better public administration[2].

Of course a multitude of successful projects within regional cooperation can be mentioned, but some of them will be discussed about and these are:

- "ERALAN 2" (The Basque Country, Spain), the project Interreg IV shows that the same abilities are being used on both sides of the French- Spanish border by two SMEs innovation laboratories. The project will compare these two private structures, in order to develop and share the methodology and specific tools in SMEs innovation. The process here is not as well developed as it is in a cluster, but it focuses namely on the process of research and innovation.

- "Eresund Science Region"- is divided into five platforms (Biotechnology, food processing, informational technology, the environment, energy, and logistics). This institution combines universities, companies which are from the category of big global groups of small start-ups, and public figures. It has a management school, technology transfer offices, it has techno-park networks and is funded both by its members as well as from external resources. Its main purpose is to promote the development in the cross-border region of Eresund, by creating a network of researchers and innovation specialists and by facilitating the transfer of technology among companies. This is one of the biggest cross-border institutions in Europe

[1] http://www.espaces-transfrontaliers.org/ressources/themes/recherche-et-innovation/recherche-innovation-4/

[2] http://ec.europa.eu/regional_policy/en/policy/cooperation/european-territorial/

which focuses on research and innovation and does not focus only on a specific group of target beneficiaries.

- The three-national French-German- Swiss cluster "Biovalley" is situated in the region of Upper Rhine. This is the cluster of Sciences of Life and has the main purpose to unite universities, hospitals, companies in order to facilitate innovation in the field of therapeutics. It has established itself as a specialist in Europe in the domain of therapeutic innovation, medical technologies, pharmaceutical products and biotechnology.

- The three-national French-Belgian, Luxembourg cluster " Internaut" is an alliance of three national clusters that have the purpose of forming a cross-border cluster in order launch research and development projects that focus on all the domains of interest of these three clusters. The cross-border factors is an advantage in this case as it allows to enlarge economic dimension in the domain of research and innovation and it brings an additional benefit which is the competition at an international scale because the cluster which has been established has the necessary dimensions to reach a global level[1].

Talking about the concept of cluster, according to Porter, it can be defined as a geographical concentration of interconnected businesses and institutions. The clusters encompass interrelated industries and other important competitive entities. These may include specialized input providers such as tools, machines, and services as well as providers of specialized infrastructure. Very often, the clusters can extend to different distribution channels as well as to the providers of the necessary tools and to related industries through common technologies or inputs. Finally, governmental institutions such as universities, agencies, and providers of professional training are part of some clusters, and this assures the access to specialized training, education, information, research and technical support[2].

The clusters can also be defined as a "...a regional network of enterprises, suppliers, research institutes, universities, and professional training centers in a specific domain which are competitive and oriented towards innovation, and which are also interrelated through the advantages of cooperation in identifying new ways of supplying the information. The main characteristics of a cluster is the flexibility of its organization, where each enterprise has its own responsibilities in dependence to the market demand and the cluster strategy" (Tantau, 2011). According to the Romanian legislation, a cluster is a group of producers, users/ or beneficiaries, that have the main goal to apply into practice the successful practices of the EU to increase the competitiveness of the economical agents.[3]

[1] http://www.espaces-transfrontaliers.org/ressources/themes/recherche-et-innovation/recherche-innovation-4/

[2] http://clustero.eu/despre-clustere/

[3] http://www.jurisprudenta.com/lege/hotarare-918-2006-ssmmz/

In the Republic of Moldova, the concept of "cluster" can be found in the Law regarding the scientific-technological parks and innovation incubators. The definition found there is the following: "*a scientific-technological cluster* is a group of legal and natural people which has been established based on an association contract between accredited institutions from the scientific and innovation domain and/or accredited higher education institutions, other non-commercial institutions on one side and businesses, local public administration authorities, professional associations, natural people, financial institutions, international organizations, and local and foreign investors on the other side. This cooperation has its main purpose to conduct scientific and educational research so as to implement the results and the innovations into practice through economic activity"[1].

Therefore, we can conclude, that the creation of clusters has the following objectives:

- ✓ to foster communication and the exchange of experience among the members of the innovation groups and networks;
- ✓ to start, develop, and implement projects of collaboration and public-private partnerships both nationally and internationally;
- ✓ to increase the visibility of the technological excellence and the innovation potential of the members of the cluster and the innovation networks;
- ✓ to encourage the adoption of new technologies and the identification of new business opportunities.

The first economist to describe clusters as „supply chains" was Alfred Marshall (1842-1924) (Marshall, 1920), who had analyzed the industrial agglomerations from England and realised that these geographical agglomerations of enterprises from a specific area create involuntarily a beneficial effect on the economy and it namely has:

- effects on the workforce: when a great number of enterprises employ workers from the same region, it generates higher salaries on one hand, and an increase in the level of professionalism of the employers on the other hand;
- effects of the specialization of the suppliers as they tend to specialise in a certainc field in order to avoid competition, which, in its turn, translates to an increase in the quality of products and a decrease in costs.
- the technological transfer: Marshal has realised that the knoweldge „is in the air" among the existing enterprises in geographical concentration regions.[2]

Jane Jacobs (Jacobs, 1969) has a different vision on the role and importance of

[1] http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=324668
[2] http://clustero.eu/despre-clustere/

clusters, including cross-border clusters. She highlighted the role of the big cities in the economic development. According to her, big cities have the role of what what we call it nowadays „urban poles of development". In his work „The competitive advantage of the nations", Michael Porter (Porter, 1990) adopts the same point of view. According to him, the economic success of a country or a region depends on the complex interaction of a group, factors which are what we call it today „Porte'r Diamond": the demand, the firm strategy and rivalry, production factors, the supply chains and the horizontal integration.[1]

All these points of view have lead to a commonly accepted model „triple helix" that unites representatives of different institutions with a cluster, and namely:

1. enterprises - represing the economic side of the cluster;
2. universities and research institutes- representing the suppliers of innovative solutions that are related to the needs of the enterprises members of the cluster.

The experience from Romania has shown the three partners of the model „triple helix" don't cooperate, even more they don't know each other so they don't have the chance to discuss with each other. In this regard, the necessity to adapt and reshape the model into the „four leaf clover"is clearly seen so as the work of the three participating institutions could be catalyzed by the involvement of a fourth institution that could be a consultancy firm in the domain of technological transfer and innovation, technological transfer center, etc. Of course, the participants of the model have all different needs and contribute differently; therefore, these have to by harmonized. The following table presents the above mentioned needs and contributions of the participating institutions[2]:

Table 1. The interests of different participants of the "Four Clover" model

Partners	**Contribution**	**Advantages**
Educational institutions	Research, elaborations, transfer of know how	-The curricula is adapted to the demands of the market; -New laboratories sponsored by the industry; - continuous learning; - increase of research centers;
Industry	Cooperation, the availability of production capacity	- increase of added value; -other competitive advantages;
Public authorities	Mediator, dissemination of information at the local, regional, and central level,	- central, regional, and social economic development;

[1] http://clustero.eu/despre-clustere/
[2] http://clustero.eu/despre-clustere/

	support	
Consultants	Trnasfer of know-how, coordination, dissemination of information at the national and international level.	-added value; -participation in an innovative network;

Source: adapted by the author: http://clustero.eu/despre-clustere/

Since 2008, the Ministry of Economy, Commerce and Business (MECMA), the General Department of Industrial Policy has made an ample effort directed towards the identification of existing and emerging clusters in Romania. In this regard, a new map-making of the existing clusters in Romanian as for the month of April 2011 has been initiated. As a result, a number of 35 clusters in their different stages of development have been identified. A system of evaluation indicators of the economic performance of the existing clusters as well as the potential of diverse industrial sectors has also been elaborated. Different domains with a potential to constitute some poles of rivalry such as automotive, ICT, electrical engineering, agro-food, wood industry have been identified.

On July the 1st, the meeting to for the Association of Clusters from Romanian took. Among the participating members, one can enumerate about 15 clusters and namely:

- The Textile Cluster ASTRICO NE, from Piatra Neamt, represented by the ASTRICO Association.
- The Textile Cluster "Traditions- Manufacture-The Future" SE (Focsani), represented by the Association Traditions- Manufacture- Future
- The Maritime Cluster SE: Constanta, represented by the Foundation Ronomar
- The Textile Cluster "Innovative Building"", Bucuresti, represented by IDS Architecture Construction SRL
- The Romanian Textile Concept Cluster, Bucuresti, Represented by the Associaton Romanian Textile Concept.
- The Agro Food Cluster Bucuresti Ilfov, represented by INMA
- The Electronic Cluster Elincrus Bucuresti, represented bu the Association of Promotion of the Electronic Technologies
- The ICT SV Cluster, represented by ARIES Oltenia
- The Touristic SV Cluster, represented by the Association for the Promotion of Tourism , Mehedinti
- The Agro Food Vest Cluster, represented by the Commerce and

Agriculture Chamber, Arad
- The Renerg Center Cluster, represented by ADR Center
- The Green Energy Covasna Center Cluster, represented by the Association Green Energy
- The Agro Food Covasna Cluster, represented by ASIMCOV
- The Pro Wood Covasna Cluster, represented by KOFA Association
- The Electro-technical ETREC Center Cluster, represented by the Association of Regional Electro-technical Cluster, ASCRET Brasov.

The main goal of the association is the promotion, relaunch, and economic development of Romanian through the support of creation, development, and cooperation among clusters at a regional, national, and international level[1]. The majority of the existing clusters are cross-border and have been created within cross-border projects Some examples of such projects can be:

❖ The Program for Cross-Border Cooperation Romania-Bulgaria 2007-2013- the project *TRANS - TOUR - NET(* (the creation and the marketing of the cross-border touristic products)[2]*;*

❖ The Operational Program The Development of Human Resources 2007-2013, Axa 5, DMI 5.1- the project A safer future *the employment in the workforce, and the decrease of unemployment)*[3]*;*

❖ the program *Black Sea Basin Joint Operational Programme 2007 – 2013 – project Black Sea TRADENET*(The project has encouraged and facilitated intra-regional partneships and cross-border cooperation, for a sustainable development in the Black Sea Basin, based on resources, activities, and networking of common interests*)*[4]*;*

❖ The Program South East Europe SEE- INNOFOOD SEE – The establishment of a series of innovative mechanisms of support and the increase understaning of the food innovation and research and technological development potential in the region of South East Europe[5].

It is important to mention that different categories of participants within the collaboration model established within the cluster have various interests and contributions, and these all have to be harmonized. As a result of this, the benefits of different particpants of the clusters can be grouped as following:

↳ ***For enterprises:***

[1] http://clustero.eu/asociatia-clusterelor-din-romania/
[2] http://www.ccina.ro/proiecte/finalizate/trans-tour-net
[3] http://www.ccina.ro/proiecte/finalizate/un-viitor-mai-sigur
[4] http://www.ccina.ro/proiecte/finalizate/black-sea-tradenet
[5] Camera de comerț, industrie, navigație și agricultură Constanța/ Chamber of Commerce, Industry, Navigation and Agriculture http://www.ccina.ro/proiecte/finalizate/inno-food-see

- cooperation at an inter-sectoral level to obtain economic advantages;
- cooperation in the technological and product acquisition process;
- the facility of a increased flow of information and technological transfer;
- the development of an integrated marketing;
- access to the funds dedicated to associated structures: European and national;
- support from the public authorities;
- the increase of competitiveness;
- economic costs;

- ***For the public authorities***

- it supports the social and economic development of the region
- it contributes to the decrease of unemployment
- it supports the promotion of the region nationally and internationally;
- it supports the development of infrastructure;

- ***For universities and research institutes:***

  - it determines to adapt school curricula to the economic realities;
  - stimulates research and innovations;
  - it develops new laboratories and modernizes the research infrastructure with the help of enterprises
  - stimulates cooperation in the scientific domain and the transfer of know-how

- ***For intermediary organizations***

- brings new clients;
- develops new products and new services;
- competitive advantages[1].

In order to make a general analysis of the effects of the functioning of cross -border clusters, the following indicators should be analyzed:

- the level of employment in the region where the enterprises participating in the clusters are situated (the unemployment rate, the number of jobs available as compared to the number of people able to work);
- the relation between the average wage within the cluster and the average wage in the region;
- the level gross Regional product, created by the enterprises of the cluster;
- the degree of diversification of the region economy where the cluster functions;
- the complexity of the infrastructure and the level of its functioning in the region of the cluster;
- the level of industrial production volume within the cluster as compared to the regional level;
- the level of investments in the participating enterprises as compared to the

[1] http://www.trec-cluster.ro/ro/content/membrii-clusterului

regional level etc.

After a detailed analysis of the results of these indicators , we can identify the following advantages for the participating entities resulting from the cooperation within the clusters:

For the member enterprises:

- cooperation at an inter - sectorial level to obtain economic advantages;
- cooperation in the technological and product acquisition process;
- the facility of a increased flow of information and technological transfer;
- the development of an integrated marketing;
- access to the European and national funds dedicated to associated structures;
- support from the public authorities;
- the increase of competitiveness;
- economic costs;

For the member public authorities:

- the support of the social and economic development of the region;
- the decrease of unemployment;
- the promotion of the region both on a national level and internationally.
- the support of the infrastructure development;

For member universities and research institutes:

- the adaptation of school curricula to the economic realities;
- the stimulation of the research and innovation;
- the development of new laboratories and modernization of the research infrastructure with the help of enterprises;
- the stimulation of the applied research and the technological transfer through tight collaboration with the economic field
- the cooperation in the scientific domain and the transfer of know-how

For intermediary member organizations:

- the attraction of new clients;
- the development of new products and new services;
- competitive advantages[1].

In conclusion, we can mention that the cross-border cooperation hat takes the form of clusters, first of all, fosters the development of the regions through the transfer of technologies, the employment of the residents of this regions, the enhancement of the potential of the universities and other educational institutions and research centers situated in these regions, the enhancement of the capacities of the regional

[1] http://www.trec-cluster.ro/ro/content/membrii-clusterului

businesses. This will in its turn result into socio-economic development of the region (through the increase of salaries, living standards, demands of the consumers, the development of enterprises, the products and their quality).

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