

Geographies of Cluster Internationalization: Inter-organizational Linkages on the Baltica

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Abstract The following research paper addresses the issue of cluster internationalization process. The methodological approach is based on analyzing pan-European projects of transnational inter-organizational cooperation, while giving emphasis on identifying networked linkages across the spatial reach of the Baltic region. Research results reveal a number of geographical locations that exhibit active cross-border regionalization processes, successfully implementing the international cluster initiative policies. A ponderable correlation between the level of urbanization of a territory and the number of ongoing international cluster initiatives is found. The distribution of international cluster initiatives in the Baltic region by specialization is presented, as well as the comparative analysis with the established cross-border clusters is given.

Keywords: *cluster internationalization, international cluster, cross-border cluster, transnational cluster, cluster initiative, cluster policy, Baltic region*

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1. Introduction

New contextual conditions of the modern economic activity highlight new strategic priorities in the development of border territories of the Baltic region. The use of cumulative innovative potential and achievement of synergy by combining the competencies of institutional actors located in a number of different countries provide promising odds to all stakeholders. National and pan-European strategies for the internationalization of regional economies of European countries have notably contributed to the formation of new types of foreign economic cooperation. One of the contemporary concepts of such international networking is an international cluster, formation of which is being actively supported in the process of implementation of programs for the creation and development of innovative clusters [1].

The European cluster policy group, mandated by the European Commission in 2008, as well as the TACTICS Reflection group have formed a number of specific recommendations for the European community on how to enhance the establishment of international clusters via initiated cluster policies [3,17]:

1) provide information support services, being a part of a unified database on existing clusters and cluster organizations;

2) promote the strategic and commercial partnerships of clusters by co-financing the national programs, reducing administrative barriers and proving concrete tools for international cooperation;

3) facilitate international mobility of cluster actors by extending the number of cross-border mobility programs, expanding the number of participants in international cooperation programs;

4) encourage the formation of transnational initiatives designed to create international cluster networks (e.g., CEE Cluster Network).

Baltic region currently represents one of the most favorable macro-regions for the formation of international clusters in Europe. Cluster policies of the Baltic region countries are developed at European, national and regional levels (with few exceptions, e.g. Russia) and define the priority development areas of the given territories. Realization of the process of internationalization and the promotion of international cluster initiatives (ICIs) in most countries of the Baltic region is carried out during the implementation of projects within pan-European programs for international cooperation [13]. In recent years, the Baltic states, Poland and Russia have joined the process of international clusters' formation.

2. A Brief Overview on International Cluster Concept

From the standpoint of the classical approach on the effects of globalization with regard to regional clusters, internationalization is seen as an exogenous factor that has a critical impact on the development of cluster (i.e. the organic cluster) at a certain stage of its life cycle [1]. In the studies of Martin and Sunley [9], Maskell and Malmberg [10], Kaiser and Prange [5] and a number of

other authors, the process of refocusing on global markets, and the development of an international network of actors is seen as a stage of transformation or rebirth (i.e. reengineering [2]) of a regional cluster. However, change in the angle of research towards *organized* [7] (i.e. *planned* or *engineered* [2,8,15,16]) international clusters gives us a contrary perspective. The internationalization characterizes the emergence phase of an international cluster, where concerted cluster policy is aimed at creating a globally oriented (i.e. born global) development strategy of regional institutions of two or more interacting countries in the framework of international cluster initiative (ICI).

The emergence and sustainable development of an international cluster presumes the formation of certain economic conditions, which act as a framework for mutually beneficial cooperation and exchange of competencies between all participants of interactions - the actors of the doubled triple helix model (i.e. the business, government, and university of the networking countries [12]). Creation and development of international clusters, either cross-border or transnational, is based on stimulating the development of international relations, which implies the use of a set of measures to create a single platform for cooperation in the framework of innovative industrial agglomerations. While according to ChristianKetels [6], one of the key areas of the cluster policy is to increase competitiveness of the regional institutions, with the cluster being not only as a subject of the cluster policy, but also as a tool for implementation of this policy. Hence, the role of public policy is to implement joint strategic actions focused on the formation of favorable conditions of the business environment and improvement of the effectiveness of ICIs. Therefore, formal bilateral and transnational initiatives on formation of unified clusters (i.e. international clusters) are of particular interest in the scope of this research.

3. Materials and Methods

The object of our study is international cluster initiative (ICI) phenomenon, which is understood as common concerted actions targeted at creating sustainable stakeholder network of two or more countries as to jointly co-create market value in the context of co-opetition. The subject of research is the process of ICIs formation in the Baltic region. The research is based on the following hypothesis: the most active ICIs arise in the regions with existing examples of international clusters. That is the presence of an international cluster can be seen as an indication that the region possess favorable economic and political conditions for the development of international business, scientific and technical cooperation as well as the regional business community is aware of the distinct benefits of participation in the cluster.

Objective of the study is allocation of patterns in the process of ICIs formation in the Baltic region. In order to achieve this goal it is necessary to complete the following steps: 1) to determine the cross-border regions in the Baltic macro-region, that have ICIs; 2) to characterize the distribution of ICIs in the identified regions (e.g. by specialization); 3) to identify patterns in the geographical dispersion of ICIs.

Since the main tool (i.e. the financial support instrument) for creating ICIs in the Baltic region are pan-European programs for international cooperation (e.g. Interreg OKS, Interreg Nord, InterregSverige-Norge, InterregSyddanmark-Schleswig-K.E.R.N., Interreg Neighbourhood Programme, Intranet, Pomerania, LatLit, Derreg, EstLat, Kohla-jarve, Centralbaltic, Southeastfinrusnpi, etc.) [13], we analyze the projects, which are financed and realized under the framework of these programs for a period from 2007 to 2013 based on the following criteria: the purpose of the project, the scope of its implementation, the participating regions and territories.

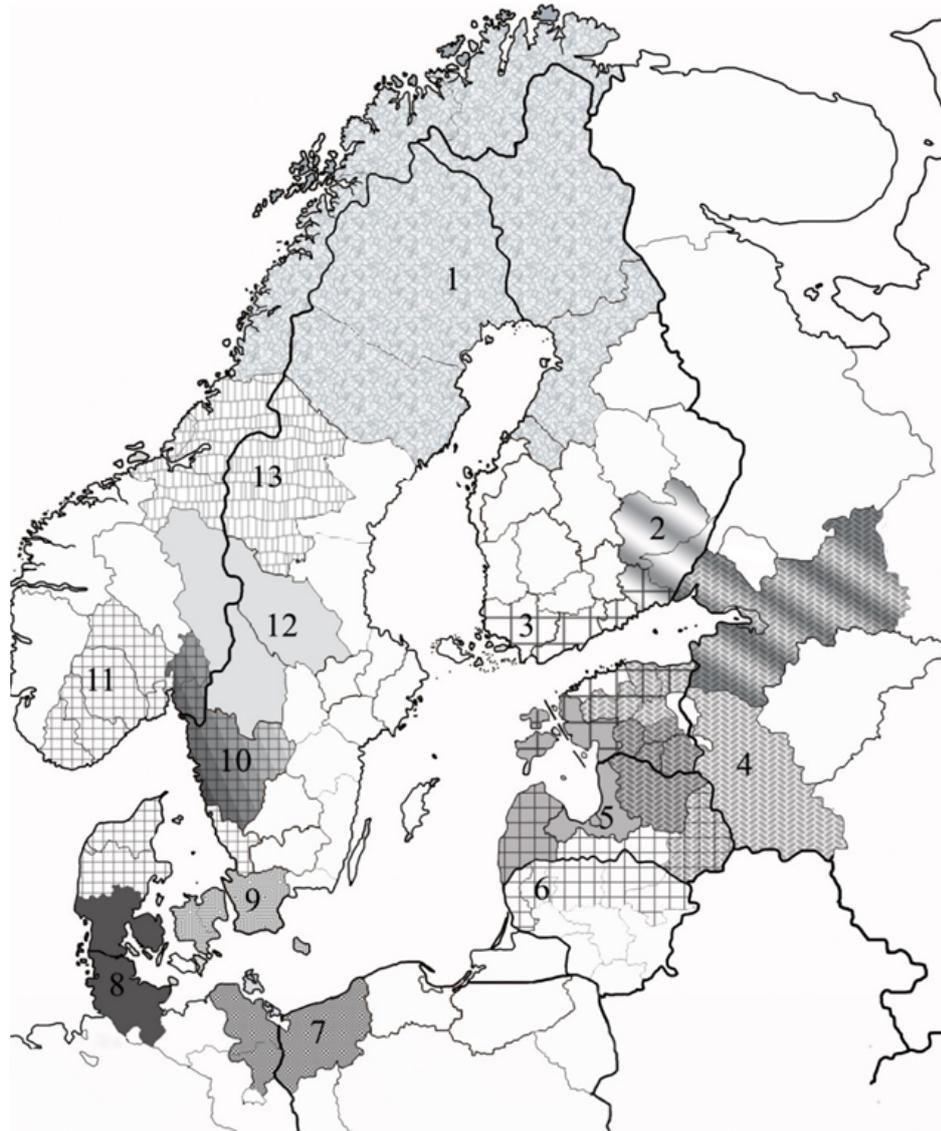
Among the full range of projects for international cooperation, authors highlight those designed for international business cooperation. We identify the geographical areas, which demonstrate the concerted actions of the authorities and other stakeholders destined to build a *cluster-like environment* [4] in a certain industry or a number of interdependent industries. While it should be noted that in most cases the project aim does not state the straightforward objective to create an international cluster. Such specific and clear focus of projects is inherent only in some regions of the Baltic region (e.g. cross-border territory of Russia and Finland). This dictates the necessity to adopt the principle of qualitative judgment of the projects' description, as well as to acquire additional information from various sources. As an information base of research were also used statistical data from Eurostat in the context of NUTS 2, official documents and materials of respective programs, projects, regional authorities, as well as scientific publications, which provide empirical evidence on clusters in the given areas, in order to obtain a qualitative assessment of the situation.

4. Research Results

Over the past decade, there has been a significant increase in the number of research and policy projects on clusters, as well as on international cooperation in the field of business cooperation. Most of the projects within the Baltic region receive EU funding via particular pan-European programmes, with a co-financing theme for some of the participating countries (e.g. Russia). On average, the share of ICIs of the total number of projects for international cooperation implemented in the Baltic region is 23.4%. Figure 1 shows the cross-border territories of the Baltic region, which exhibit examples of identified ICIs.

The largest share of projects that affect or are directed towards the establishment of international clusters of the total number of projects for international cooperation is typical for the border area of Finland (province of South Savo, North Savo, South Karelia, Kymi, Uusimaa and HämePaijanne) and Russia (Leningrad Oblast, including St. Petersburg and the Republic of Karelia) – 40%. However, the remarkable percentage is due to the small number of cross-border cooperation projects (only 36 in total; e.g. compared to 104 in Bothnian Arc, 72 in Jutland and 70 in Oresund), as well as to the chosen specialization area of the projects - organization of business cooperation of small and medium enterprises of the two countries. Regions Jutland (37%), GO (34%) and Skagerrak (30%) also entered into four regions, with about one third of

projects being aimed at creating international clusters (Figure 2).



- | | |
|---|---|
| 1 – Bothnian Arc region – Sweden and Finland, 22%; | 2 – border territories of Finland and Russia, 40%; |
| 3 – border territories of Estonia and Finland, 28%; | 4 – border territories of Estonia, Latvia and Russia, 26%; |
| 5 – border territories of Latvia and Estonia, 11%; | 6 – border territories of Lithuania and Latvia, 10%. |
| 7 – Pomerania region – cross-border territory of Germany and Poland, 16%; | 8 – Jutland region – Denmark and Germany, 37%; |
| 9 – Oresund region – Denmark and Sweden, 18%; | 10 – GO region (Ostfold - VastraGotaland) – cross-border territory of Norway and Sweden, 34%; |
| 11 – Skagerrak region – Denmark, Sweden and Norway, 30%; | 12 – Inner Scandinavia – cross-border territory of Norway and Sweden, 17%; |
| 13 – Nordic Green Belt – cross-border territory of Norway and Sweden, 15%.* | * <i>percentage describes the proportion of projects aimed at establishing international clusters out of the total number of projects for international cooperation</i> |

Figure 1. Territorial unions of the Baltic region marked based on actual implementation of international cluster initiatives

Jutland (37%), GO (34%), Skagerrak (30%), Estonia-Finland (28%) cross-border regions have a high socio-economic potential. Considerable human resources of the Baltic region are concentrated in the countries that represent these cross-border regions, namely Denmark, Sweden, Germany, Norway, Finland and Estonia. The density of population living on the territory of the administrative-territorial entities within the considered cross-border regions is higher than in other regions of the same countries. In addition, these regions are characterized by an increase in the number of working age population. It should be noted that the inflow of human resources is assumed to be a positive factor for the

development of clusters. While the population and employment indicators are the ones to be most frequently used in cluster mapping and cluster benchmarking research.

Cross-border regions, that are leading in the share of ICIs of the total number of projects for international cooperation, characterized by a significant concentration of industry and high rates of employment in the industrial economy (25 to 35%, on rare occasions from 15 to 25%). The level of GRP by PPP in these regions is above average for the EU-27 (especially in metropolitan areas). High concentration of employment in a particular area of economic activity is one of the signs of emerging or an

existing cluster (see: E. Feser, E.M. Bergman, D. Cortright). For example, the region Inner Scandinavia has one of the highest rates in the Baltic region of employment in construction and became one of the regions in which the projects have been initiated to establish an international cluster in the field of construction. A similar

trend is observed in other regions. Figure 3 shows the defined areas of ICIs' specialization in the Baltic region, whereas Table 1 reflects on the number of cross-border regions of a given country that participate in ICIs of a certain specialization.

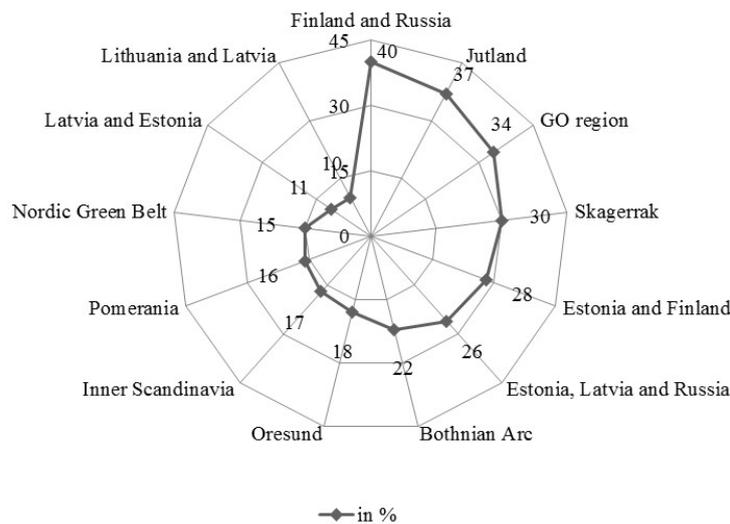


Figure 2. The share of international cluster initiatives of the total number of projects for international cooperation in cross-border region, in %

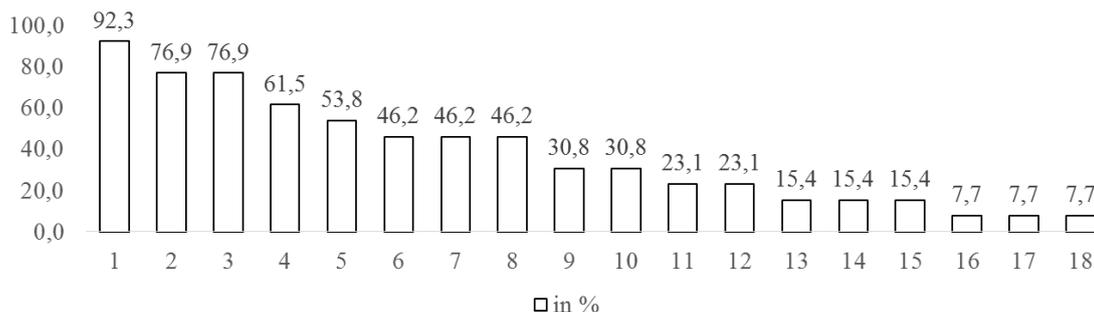


Figure 3. The share of cross-border regions in the Baltic macro-region with the respective specialization, in %

Table 1. Number of cross-border regions with the participation of the country, which exhibit international cluster initiatives, in units

country	Total	Corresponding type of specialization*																	
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
Denmark	3	3	3	3	3	1	3	-	1	2	1	-	1	-	-	-	1	-	-
Sweden	6	6	5	5	5	2	3	1	4	2	1	-	2	-	-	1	-	-	1
Germany	2	2	2	1	1	2	1	1	2	1	-	-	-	-	-	-	1	-	-
Norway	4	4	3	3	3	2	1	-	3	-	-	-	2	-	-	1	-	-	1
Finland	3	3	3	3	2	1	2	3	1	2	2	1	1	1	-	1	-	1	-
Poland	1	1	1	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-
Lithuania	1	-	-	1	1	1	-	1	-	-	-	1	-	-	-	-	-	-	-
Latvia	3	2	1	2	1	2	2	2	-	-	1	2	-	1	2	-	-	-	-
Estonia	3	3	2	2	-	2	2	2	-	1	2	1	-	1	2	-	-	1	-
Russia	2	2	1	1	1	1	2	1	-	-	1	2	1	2	1	1	-	-	-

*Note: A – environmental technology; B - life science; C - R&D and nanotechnology; D – energy; E – tourism; F – ICT / IT; G – agriculture; H - culture and the arts, incl. film industry; I - transportation and logistics; J – food processing; K - forestry, incl. wood processing and furniture industry; L - fishing and fish industry; M – metallurgy and metalworking; N - chemical industry; O – construction industry; P – maritime; Q – business services; R - social sector.

The main directions for the formation of international clusters in the Baltic region countries are environmental technology, life science, research and development, and nanotechnology. Such distribution can be explained by the exceptional interest of countries – initiators of the projects, to exercise bi-national and transnational synergies in developing high-tech sectors of the economy (Table 1). International cluster in this case is used as one of the

cluster policy tools, aimed at developing an innovative economy and being the successor to industrial policy mechanisms. In most regions of the NUTS 2, included in Jutland, GO and Skagerrak cross-border regions are marked with consistently high performance in funding the research sector, more than 3%. Only in few of them relating to Denmark, Germany and Norway the figure is slightly lower: from 1 to 2%. More than one fifth of the

economically active population of Jutland, GO and Skagerrak are engaged in the research and development activities, with the share of researchers being about 1% of the total employed population. Highly urbanized areas of these cross-border regions are marked with high rates of patent applications to the European Patent Agency: 150-250 applications per million inhabitants, with an average European level (EU-27) being 111 applications per million inhabitants.

Yet another observation deduced from the research findings is the variety of specialization areas supported by each country via ICIs. Russia is engaged in 13 different

specialization areas of ICIs within the cross-border cooperation with Latvia, Finland and Estonia. However, to date there are no evidence on international clusters formed with the participation of the Russian Federation. For comparison, Sweden – a country-leader in the number international clusters in the macro-region has a relatively small number of key development areas (i.e. specializations), while being represented in large number of cross-border regions with ICIs. Comparison of the specialization areas of ICIs and organized international clusters in the identified regions is presented in the [Table 2](#).

Table 2. Areas of specialization of international clusters and initiatives in cross-border regions of the Baltic region

№ S.*	Cross-border regions with allocation of		
	clusters	initiatives	clusters and initiatives
1	-	Skagerrak; Bothnian Arc; Inner Scandinavia; Nordic Green Belt; Pomerania; Latvia and Estonia; Estonia, Latvia and Russia; Estonia and Finland; Finland and Russia	Oresund; GO; Jutland
2	-	Skagerrak; Bothnian Arc; Nordic Green Belt; Pomerania; Latvia and Estonia; Estonia and Finland; Finland and Russia	Oresund; GO; Jutland
3	-	Skagerrak; GO; Inner Scandinavia; Lithuania and Latvia; Latvia and Estonia; Estonia and Finland; Finland and Russia	Oresund; Bothnian Arc; Jutland
4	-	Oresund; Skagerrak; Bothnian Arc; Inner Scandinavia; Nordic Green Belt; Lithuania and Latvia; Finland and Russia	Jutland
5	Bothnian Arc	GO; Nordic Green Belt; Pomerania; Lithuania and Latvia; Estonia, Latvia and Russia; Estonia and Finland	Jutland
6	-	Skagerrak; Jutland; Latvia and Estonia; Latvia and Russia; Finland and Russia	Oresund; Bothnian Arc
7	-	Pomerania; Lithuania and Latvia; Latvia and Estonia; Estonia and Finland; Finland and Russia	-
8	Oresund	Bothnian Arc; GO; Nordic Green Belt; Jutland	-
9		Bothnian Arc; Estonia and Finland	Oresund; Jutland
10	Jutland	Latvia and Estonia; Estonia and Finland; Finland and Russia	Oresund
11	-	Skagerrak; Lithuania and Latvia; Estonia, Latvia and Russia; Finland and Russia	Bothnian Arc
12	-	Skagerrak; GO; Finland and Russia	-
13	Skagerrak; Bothnian Arc	Estonia, Latvia and Russia; Finland and Russia	-
14	-	Latvia and Estonia; Estonia, Latvia and Russia	-
15	-	Inner Scandinavia; Finland and Russia	-
16	-	Jutland	-
17	-	Estonia and Finland	-
18	-	Nordic Green Belt	-

*Specialization type: 1 – environmental technology; 2 - life science; 3 - R&D and nanotechnology; 4 – energy; 5 – tourism; 6 – ICT / IT; 7 – agriculture; 8 - culture and the arts, incl. film industry; 9 - transportation and logistics; 10 – food processing; 11 - forestry, incl. wood processing and furniture industry; 12 - fishing and fish industry; 13 – metallurgy and metalworking; 14 - chemical industry; 15 – construction industry; 16 – maritime; 17 – business services; 18 - social sector.

Comparative analysis of international clusters and initiatives according to specialization areas, as well as their geographical scope indicate a number of patterns:

Firstly, priority areas for ICIs in the Baltic macro-region coincide with major existing international clusters (eco-technology, life sciences and nanotechnology, R&D [14]). This distribution is explained by the fact that Nordic countries and Germany seek to establish international clusters based on existing competencies, meanwhile, the Baltic countries, Poland and Russia anticipate the prospect of a particular industry and its attractiveness with regard to global competitiveness and prerequisites to future cooperation in the scope of the Baltic region;

Secondly, less than half of the regions with ICIs have formed international clusters (mainly Scandinavia and Germany), which indicates the difficulty of forming a system of international cluster interactions and necessity to possess generally high level of economic and innovative development of the participating countries and a significant potential in a particular area;

Thirdly, the Baltic countries, Poland and Russia correspond to a number of specific promising areas of

cooperation, including agriculture, forestry, and manufacturing industries.

5. Conclusion

Formation and development of international organized clusters is a long and complex process that requires the member states to have a strong innovative capacity, globally competitive economy, as well as a significant amount of annual investments in the sphere of science and education, and in support of ICIs and international clusters that are already formed.

The state plays a key role in the formation of a favorable environment for international clusters, resulting in the creation of appropriate economic framework conditions and to simplify the system of inter-organizational interactions between institutional spheres of the respective countries. The border regions should sign agreements on cross-border and transnational cooperation as to facilitate and simplify the process of staff mobility and financial flows; integrated cross-border regions are to

be established with relevant committees, aimed at promoting active social and economic integration of the two (e.g. Oresund region) and more countries (e.g., Skaterrak region).

Due to the fact that innovation is a key characteristic of an international cluster and the driver of ICI, universities are regarded as growth points and the core of the cluster. This is despite the membership of large TNCs in a cluster. Providing the leadership position to universities, by delegating the role of coordinator for interactions, financial flows, management structure of ICI and the cluster organization (Note 1), gives the country an opportunity to gain access to the latest technologies and innovative design of the market-leading companies (TNCs in particular). In turn, increasing innovative capacity helps to attract even more interdependent and competitive enterprises to the region. University start-ups (i.e. small innovative enterprises) will eventually become competitive enterprises, while universities remain as the key centers of competence influencing the development of a market for innovative technologies and anticipating companies' needs in specialists (Note 2).

The role of the business sector in the formation and development of international clusters is the commercialization of research results, created by universities or in partnership projects (Note 3), as well as investment funding for specific projects within the overall university specialization. In other words, a commercial enterprise can initiate development project of a narrowcasting applied technology in the key research areas of a specific university. Thus, ICI requires presence of international actors of all three major institutional spheres in the system of cluster interactions, namely university-business-government, as each of them has a specific role and appropriate features. Absence of at least one of the system components, weak linkages (i.e. lack of coordination) between the actors or a failure to fulfill their duties, disables the switch from the cluster initiative to a functioning international cluster.

Note

Note 1: International organized clusters, as well as ICIs are generally registered as subdivisions of universities.

Note 2: Universities anticipate the need for specialists in new promising areas a few years ahead of the labor market demand.

Note 3: Typically, a joint university – business research project takes place in private-financed laboratories, which

are based on university infrastructure, while directed on development of highly specialized technology.

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