

# Research of Potential Cluster Development in Pannonian Croatia

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**Abstract**—The paper presents an analysis of linkages and structures of co-operation and their intensity like the potential for the establishment of clusters in the Central and Eastern (Pannonian) Croatia. Starting from the theoretical elaboration of the need for entrepreneurs to organize through the cluster model and the terms of their self-actualization, related to the importance of traditional values in terms of benefits, social capital and assess where the company now is, in order to prove the need to create their own identity in terms of clustering. The institutional dimensions of social capital where the public sector has the best role in creating the social structure of clusters, and social dimensions of social capital in terms of trust, cooperation and networking will be analyzed to what extent the trust and coherency are present between companies in the Brod posavina and Požega slavonia County, expressed through the readiness of inclusion in clusters in the NUTS II region - Central and Eastern (Pannonian) Croatia, as a homogeneous economic entity, with emphasis on limiting factors that stand in the way of greater competitiveness.

**Keywords**—Analysis of linkages, structures of co-operation, Cluster, Region

## I. INTRODUCTION

CLUSTERS are geographically concentrated, interrelated economic entities, specialized suppliers, service providers and associated institutions in a particular area that are representing the region or state [1]. In the entrepreneurial economy, the cluster is defined as the joint action of several related groups within a social activity. The term itself denotes a process which is conducted within the gathering something to the group, which from the economic point of view means union of other business entities that seek to achieve common goals. Cluster can be defined as a set of economic activities, economic entities, institutions, concentrated geographically (locally or regionally), who established a formal or informal relations between themselves, the horizontal and vertical, and the favour of the industrial sector through which they exchange information, knowledge and goods for the development of a common product [2]–[6]. Within the cluster entrepreneurs can more accurately plan production processes, reduce production costs, introduce information systems in the whole process and respond quickly to changes in the environment. Organizational structure of the cluster-system has been successful in terms of the interconnectedness of individual small, medium or large

companies that accept new forms of business thought and action, and above all, create a new business philosophy [3]. By saying that, we should especially emphasise that the competitiveness of each business entity depends primarily on its ability to accept the new world of knowledge and application of scientific achievements. In the theoretical sense now we can distinguish between national, international and regional clusters. [7]. Involvement of Croatia in the trend of international economy would allow increased exports. The Croatian economy clusterization process is just begun, and is developed just on the regional principle.

Regional cluster can be defined as geographically associated concentrations of independent companies [8]. Later in his work, Porter, as an element that makes the cluster, includes the institutions, referring to examples from the practice where some clusters contain institutions, and others do not [3]. Essential features of the cluster are active channels for business transactions, dialogue and communication. Without active channels, associated companies do not make social system and therefore do not operate under the auspices of the cluster. The success of some regional clusters redirected attention to the creation of external economies and the role of knowledge and local communities to encourage the competitiveness of related businesses. There are two main criteria that determine regional clusters. First, regional cluster constrains the geographical area with a relatively large number of companies and employees within a small number of related industrial activities. Second, although economic entities in regional clusters are collaborating with other companies and institutes for research and development, they are part of local networks, particularly the production system and therefore they are called regional innovation networks. According to the European Commission, Observatory of European SME's, Regional Cluster in Europe, there is a hierarchy of three concepts in the frame of clustering: Regional cluster are concentration of an independent companies within the same or similar industrial sectors in small, limited area, a regional innovation network is more organized, contracting, cooperation between companies, encouraged by trust, norms and agreements, in order to encourage innovation activities, regional innovation systems represent the collaboration of different companies and organizations for the development and dissemination of knowledge. These systems tend to connect subjects and also include horizontal cooperation. The concept of regional innovation systems encourage innovation process flow of ideas, information and knowledge within the clusters through the co-operation with companies, educational institutions such as universities, colleges, centers for the courses, institutes, agencies for technology transfer and financial institutions.

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These organizations possess important competencies, gather work force and collect the necessary funds to support regional innovation [1]. The most frequently mentioned four approaches to interpreting the processes of regional clusterization are: Industrial zone, California schools, Nordic School and Porter's concept of industrial clusters. Porter believes that the company capital gain competitive advantage in regional clusters because of better access to specialized and experienced workers, suppliers, specialized information and public goods, encouraging competitiveness and attract customers.

## II. WAY OF CLUSTERING TOGETHER

Industry cluster includes companies and related industry vertical (buyer-supplier) or horizontal (common consumers, technology, etc.) In Croatia, vertical specialization in trade and export of lower quality is dominant [4].

An important document that supports the bottom-up approach to development is the Croatian Regional Development Strategy (Strategy and Capacity Building for Regional Development). The strategy is based on the standard European aspects in development of strategies: compliance with local interests and projects, partnership approach, linking the interests of private, public and civil sectors. The strategy highlighted the need to reduce the gap in development among regions with the need for faster development of underdeveloped counties. A way of creation and functioning of clusters is based on the primer organizational features of entrepreneurship, or the definition and classification of activities required to achieve strategic goals and business plans, grouping these activities in accordance with the available human and material resources, optimal allocation of available resources according to groups of activities, awarding each group of activities with an authorized and qualified leader to oversee and implement these activities, the horizontal and vertical linking group activities, the awarding authority coordinators of the business, ensuring the smooth flow of information from the top to the bottom of the organizational structure and vice versa.

In the European countries, today, different approaches to the development of clusters are present. Countries like Denmark, France, the Netherlands, Portugal and Great Britain have different political clusters for national and regional level, Ireland has had a long tradition of competition in which clusters occupy a special place, Sweden among the developed countries was last to launch a national program of development of clusters, and Belgium and Spain cluster policy explicitly define the regional level. Germany, Italy, Austria, Belgium and Denmark have their own specific cluster policy. But it is crucial that the policies of clusters are implemented to promote economic development and structural changes, often by increasing the (regional) innovation capacity, it is based on advanced business cooperation and networking that may require stimulation of social processes, policies that also include connecting companies with a regional technological infrastructure, education and facilities for research and development. In the process it self, it is important to seek for introduction of new technologies in regional networks of small

and medium enterprises, and creation of regional innovation systems. Policies are emphasizing the role of public and half-public organizations as intermediaries in encouraging the creation of entrepreneurial networks and joint projects. Especially in the initial stage of creation of clusters the presence of a third party is required in order to help building of mutual trust of members of clusters and formation of business networks. All policies emphasize the need to increase innovation capacity and knowledge management in companies. Particularly important are policies that focus on the essential encouraging of the creation of specialized factors and specialized knowledge in regional clusters.

Central role in promoting clusters and social capital played OECD, as a key element of economic recovery post-communist Central, Eastern and South-eastern Europe (CESEE) and constructed a strong link between the clusters and social capital. [9]. Social capital consists of three dimensions. The first is trust, meaning of witch is: the initial willingness to cooperate not only with family members or companions. Second dimension is to associate. Association and the adequate joint action allow the direct experience of cooperation and its benefits, such as the realization of interests that are outside the scope of individual effort. The last, third dimension, respect for norms, which can be called civilized, at the same time is the result of the first two dimensions and their support [10]. Social capital in the real world of economy is a kind of entry ticket for the business. Social capital is more expressed on global than at the regional level [11]. Because of the institutional dimensions of social capital where the public sector has the best role in creating the social structure of clusters, and social dimensions of social capital in terms of trust, cooperation and networking, in the paper is analyzed how far entrepreneurs recognize their business and relationship with other participants in the business environment in Brod posavina and Pozega slavonia counties, and it is expressed through the readiness of inclusion in clusters with emphasis on limiting factors that stand in the way of greater competitiveness.

## III. CLUSTER POLICY IN CROATIA

In the recommendations for increasing competitiveness, regional development and development of clusters [12], cluster policy in Croatia highlights goals; uniformity of regional development, human resource development, with the intent to keep the population in a particular area opening prospects of labour and employment, strengthening the competitiveness and economic restructuring on the basis to facilitate access to technology, information resources, finance and market information. Recommendation is to promote local development initiatives and instruments of regional development as well as establishment and functioning of network of regional development agencies, encouraging the already existing "self-developed" local development and entrepreneurial initiatives, the establishment of development agencies / centres with particular purpose, aimed at specific sectors and the needs of local industries, by developing agencies for technological development and research centres, by analysing possible areas for development of clusters and

cluster-training manager. Research has shown that positive changes are present in the period 2002-2005. in entrepreneurial activities in all regions, mostly in Slavonia and Baranja, Lika and Banovina, and northern Croatia, which led to the reduction of differences between regions [13]. Institute for International Relations, in the meaning of clusters, can hardly say that in Croatia there are clusters in general [14]. According to Ministry of Economy data base (3rd International conference of clusters, 2009.), which in 2005. started co-financing of project "Clusters - a joint product", so far launched 46 clusters and cluster initiatives in which 404 entrepreneurs were associated with about 25,000 employees. Clusters are originating from different regions in Croatia and in various industries such as wood, medical equipment, manufacturing equipment, utilities, food and metal. Most clusters in Zagreb, then Varazdin, Osijek baranja, Istria and Medimurje County. Since 2005. until 2008. in order to support the establishment of clusters the line ministry has allocated 17 million kuna, and 2009th year to encourage cluster development is planned to allocate five million kuna. Between the extremes of these statements is shown time and the fact that there is a clear message to the cluster policy, institutional support and communication structure in Croatia, there is no feedback connection from the level of local entrepreneurs to the national level. Clusters remain rather empty concept with a lot of initiatives that rely on external funding and consultants, so there are no clear lines of responsibility. There is recognition of the importance of government incentives for small and medium enterprises in clusterization established as one means of achieving that goal. Unfortunately, the general problem of bureaucracy and inefficient public administration, combined with the lack of common strategy and inefficient system of introducing the policy, which applies to Croatia. Entrepreneurs and local business interests as crucial participants in the process of clusterization, absent from the political process and have no clear communication channel with the relevant authorities, and with it the policy of the cluster does not mention the possible recognition of the importance of social capital.

Results of extensively conducted research in Denmark, Ireland and Wales [11], and research in 12 regions in the UK [15], which were carried out in order to promote cooperation between medium and small businesses with the aim of improving the capacity of innovation, has shown that the level of social capital is associated with the level of economic effects.

Despite all recommendations, experiences of different countries and regions, it is found that clusters are not uniform, that competitive advantage can work in specific circumstances, and this is usually the case when the cluster was built on a well established natural resource or industrial capability. According to the data of Croatian Employers' Association in Croatia, there are examples that offer potential for clustering at the regional level. Existing conditions can be used at the regional and local level, starting with a systematic revision of the base of small and medium-sized enterprises in selected sectors and their links with local training and technical infrastructure. In this sense, it is necessary to determine whether there are preconditions to create or the potential for the establishment of clusters in Brod

posavina and Pozega slavonia County that can be applied to the regional level (Pannonian Croatia).

Economy of Central and Eastern (Pannonian) Croatia, compared with the other two NUTS II regions have bad indicators. Pure economic power of Central and Eastern (Pannonian) Croatia is reflection of war devastation, a consequence of the transition [16] and it is linked with various forms of distrust [17], [18], which is not characteristic only of Pannonian Croatia but it is expressed in this area in greatest volume. Despite the poor economic indicators of Central and Eastern (Pannonian) Croatia there are still industries presenting the traditionally held subsistence level of the Counties itself. Many of traditional industries by increasing competitiveness can become drivers of development at the regional and national level. These are in Brod posavina County and Pozega slavonia County: furniture manufacturing industry, wood processing, metal industry and metal processing industry. Clusterization is one of the possible processes that can increase competitiveness in the conditions of existence and other important self-organization requirements. Are there preconditions to create or the potential for the establishment of clusters in Brod posavina and Pozega slavonia County is just to be examined by the present traditional industries, which is representing a form of state for other counties within the region because of its homogeneity.

#### IV. METHODOLOGY

For the purposes of this analysis survey was done in beginning of 2010. The aim of research was to determine whether there is potential for the establishment of clusters in the area of Brod posavina and Pozega slavonia County, as part of a homogeneous statistical areas of Croatia [19] - Central and Eastern (Pannonian) Croatia.

The research is based on qualitative and quantitative methodologies. The research was conducted on a sample of entrepreneur representatives in metal and wood processing in Brod posavina and Pozega slavonia counties where the survey method was used. The discussion was opened and individual interviews were performed. The questionnaires for the research were then distributed by email and fax in order to reach a critical sample of 60 companies. 14 companies did not reply. The aim of the questionnaire is to find connections that respond to identified linkages, size and missing points which exist in their companies, business or organization.

#### V. RESEARCH RESULTS - LINKAGES AND STRUCTURES OF CO-OPERATION; BUSINESS AS IT IS

Among the participants, the representatives of companies were average age of 31.5 years, the most common age of company is of 17 years; the median was also 17 years. 75% of the companies are less than 20 years. The average number of employees in the companies examined is 92,4 employees, the median is 89 employees, and 75% of companies have less than 125 employees.

In addition to questions about the general data of the survey respondents (company size, number of employees, type of activity, year of foundation) posed the question: What kinds of mentioned relationships, in what kind of intensity, can be

identified as existing in your business, company or organization, grade 1 = not present anything of the above; 5 = strong / high presence. Definitions and description of the link collective activities are presented to respondents.

Linkage for collective action	Definition and description
Vertical supplier links	Relationships with individual customers or suppliers used to provide a better service. These are usually based on interpersonal relationships although they can be supported with contracts
Horizontal supplier links	The ability to contact other firms for information, assistance, referrals and learning. Built up through reciprocity over time and previous knowledge of each other. They are seen by businesses as a safety net and a "bank of goodwill"
Horizontal formal collaboration	Collaboration between a smaller numbers of companies (less than ten) for joint activity. Relationship supported by formal agreement or contacts
Formal associations	Membership clubs, trade associations and networking groups that are set up by service providers
Gaining access to common assets and resources	Government bodies (local, regional, national and international) that provide services, education and infrastructure which individual companies could not provide themselves. Some private sector organisations can provide these goods if there is demand from companies (e.g. training colleges)

The results of this part of survey are shown in Figure 3 and 4, which are showing the vertical orientation of doing business in metal and wood processing in Brod posavina and Pozege slavonia counties.

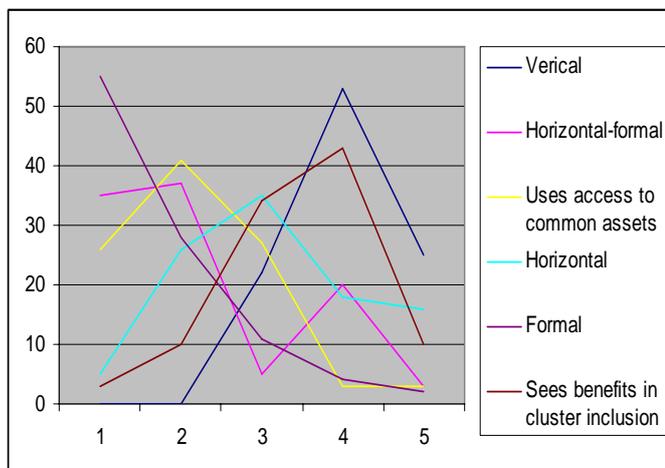


Fig. 1 Linkage for collective action in metal and wood processing in Brod posavina and Pozege slavonia counties

In analysing the returned questionnaires vertical linkage is considered as important and formal-linkage was considered as not important. There were no correlations found between the size of the companies and number of employees with the type of linkage. 94% of respondents see the benefits of their company being member of the clusters.

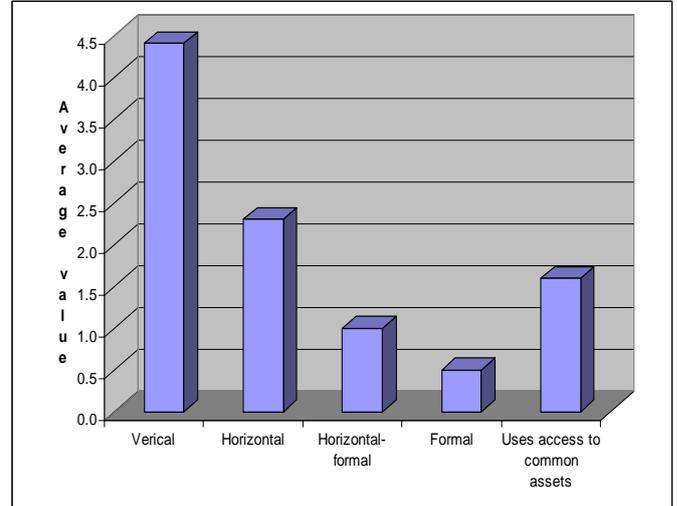


Fig. 2 Average quotations on linkages in metal and wood processing in Brod posavina and Pozege slavonia counties

Fig. 2 showing that average values extracted from the given quotations indicate a clear vertical orientation. On the question of whether you see your cluster on the local (county level), regional (various neighbouring counties), national or international level shows that the sphere of the interest for potential cluster primarily on a national, then on a regional level.

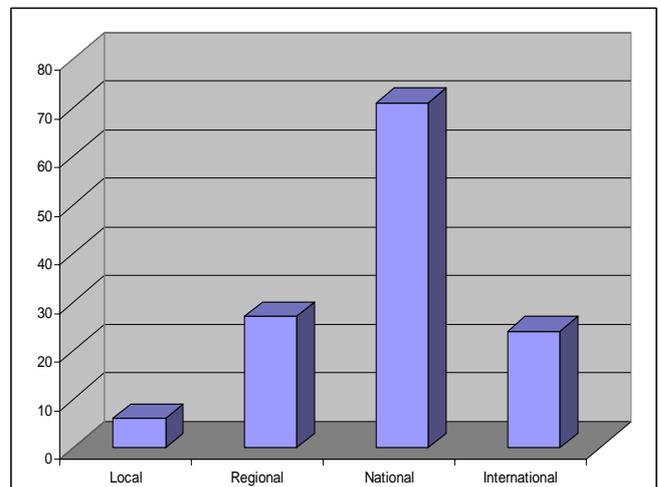


Fig. 3 Geographic interest sphere of potential cluster in metal and wood processing in Brod posavina and Pozege slavonia counties

Only 24 cases indicated a broader cross border view. The summarised value of all four options is >100% due to the fact that some answers indicated more than 1 level, mainly regional and national. The answer to the question of what you believe is missing that would've been a part of the beginning of the creation of a cluster, with the rounding of one or more questions, is shown in Fig. 4.

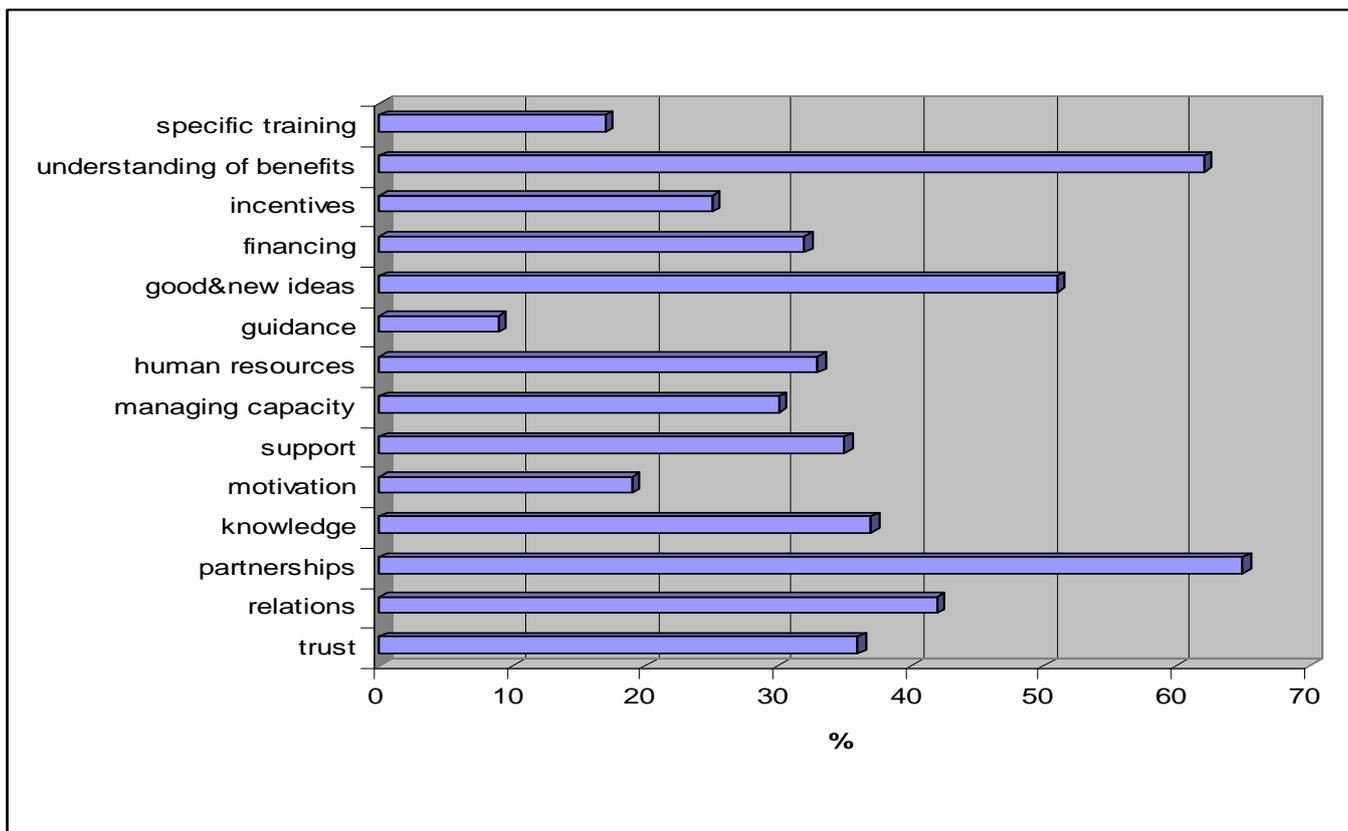


Fig. 4 The lack that prevents inclusion in clusters in metal and wood processing in Brod posavina and Pozega slavonia counties

Fig. 4 is showing that the respondents expressed a lack of information, innovation and connectivity, as an indicator of the level of social capital as the base for inclusion in the cluster. The issues networking, innovation and information need to be tackled if one wants to prepare the grounds for the establishment of a cluster in the Brod posavina and Pozega slavonia counties and in the other counties in Panonian Croatia. One should understand the relation between four elements in Figure 6; trust, relations, partnerships and knowledge, is the simplest view of social capital level. Knowledge needs to be shared. In order to share something with someone else you need to have trust in the other. If there is no trust, one is not able to create relations and without relations there is no establishment of partnership. Innovation is a known as a driver for development, and highlighted the lack of new ideas should be eliminated by establishing a clusters independently of the activities in which they are created. Understanding of the benefits can be solved through good information which is based on communication. The questionnaire shows in general that human capital is missing; motivation, managing capacity, human resources, guidance and specific training ( $\leq 30\%$ ), whit which survey participants indicate satisfaction about mentioned elements.

#### VI. CONCLUSION AND IDEA FOR FURTHER RESEARCH

Conducted research provides the basic recommendations for cluster management in metal and wood processing. It is related to Brod posavina and Pozega slavonia counties, with

possibilities of extended activities to the NUTS II level, Central and Eastern (Panonian) Croatia through the need for further research and encourage the pooling for the subjects, acceptable way:

- Build up a critical mass of information, knowledge, skills and technology to allow groups of companies to seize new organisational models and technologies as viable business opportunities
- Invest in network management and social capital building through the training of network mediators and the selection of cluster managers, among other things.
- Increase productivity through joint communication and information links, specific education and training programmes and local supply chains.
- Increase innovation through joint research and development and outsourcing of research and development.
- Enhance openness by enabling new members to bring in new knowledge, resources, technology and experience and by encouraging linkages with international network structures.

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