

# Present state analysis of cluster initiatives in Serbian transition economy

GAJO M. VANKA<sup>1</sup>, WIM J.M. HEIJMAN<sup>1</sup>, ZORICA VASILJEVIC<sup>2</sup>

<sup>1</sup>*Department of Social Sciences, Economics of Consumers and Households Group, Wageningen School of Social Sciences (WASS), Wageningen University, Wageningen, the Netherlands*

<sup>2</sup>*Department of Agricultural Economics, Faculty of Agriculture, University of Belgrade, Belgrade, Serbia*

**Abstract:** The main goal of the paper is to determine the role of clusters in the economic development strategy of underdeveloped regions in the Republic of Serbia, especially their importance for small and medium-size enterprises. This research aims to provide answers to the question as to how to establish and develop functional clusters that will have a positive impact on the development and survival of the regional economy in Serbia. Considering the specific economic situation of underdeveloped regions in Serbia and the constraints concerning the availability of data necessary for research, a combination of qualitative and quantitative analysis has been employed. Due to the scarcity of data, it was necessary to collect data both directly from business subjects and from the official statistics. The paper presents the current micro and macro-economic background of the business environment in three sections. The first offers a theoretical sketch of the current geographic and economic theories and their relevance for the business clusters and competitiveness of the country. In the second section, the business location and cluster development tendencies in the country are described. Finally, the third section analyses the most productive industries in Serbia from the cluster development point of view. In the conclusion, recommendations are made which could act as appropriate guidelines for the business innovation strategy of the country.

**Key words:** business clusters, business environment, innovation, knowledge economy, location, micro and macro levels, Serbia

During the last two decades, the economic policies of countries all over the world have focused on macroeconomic stability as a key guarantor of development and prosperity, and increasingly emphasised the importance of microeconomic conditions. The ongoing structural changes have led to globalisation and shaped the information society, economy increasingly being based on knowledge. The conclusion of the European Council in 2000, through the Lisbon strategy (Ketels 2003), implies that Europe could become the 'world's most competitive and dynamic knowledge-based economy'. Maskell (2002) reports that an increase in productivity and knowledge transfers are the two most important benefits for the local geographical clusters (Bathelt et al. 2002). In this context, according to Ketels et al. it was shown that successful macroeconomic policies are only a prerequisite, but not a guarantee for a faster development (Ketels et al. 2006). Wealth arises at the microeconomic level, which is based on the quality of the business environment, operating practices and strategies of companies (Porter 1979;

Maskell and Kebir 2005). Porter (1998) states that geographical location still plays a significant role in the cluster competitive advantages and will continue to do so in the future, as global economy and innovations persist in their acceleration. Considering these circumstances, according to Krugman (1991b) it will be even harder to tap new knowledge from a distance in the future (Krugman 1991b). Therefore, a source of competitive advantage still lies in the local potential: knowledge, relationships and motivation which distant rivals cannot replicate (Krugman 1991a; Porter 1998). As Porter's (2000) theory explains, a faster transportation, new trade agreements and a better communication should diminish the influence of geographical location in the terms of competition. Nowadays, any company can source goods, capital, information and technology fairly easy over the globe, thus effecting the conventional wisdom about how companies and nations compete. Porter (1990) proceeds by claiming that the present competitive advantage can be gained by making a more productive usage of inputs, this in turn requiring a

continuous innovation. Porter also points out that clusters are geographic concentrations of interconnected companies and institutions in a particular field (Porter 1998). Therefore, the economic policy makers in Europe specifically expressed their support for the cluster development policy, as witnessed by numerous studies and analyses. However, the cluster concept is not new; it was discussed in the United States at the beginning of the twentieth century with the emergence of corporations and their increase in productivity. Since then, the clustering approach has been considered in the context of the ability to accept innovation not only at the corporate, but also at the regional level, and now at the national and multinational level. One of the sector components to encourage local economic development is related to the business clusters that form companies or entrepreneurs who are in the chain of related industries and services and who have certain common interests and needs. According to the cluster principle of economic development, instead of working on the development of individual companies, a group of industries in a key sector is given the option of developing new features in clusters as small and medium-sized enterprises and entrepreneurs; in this way, they are much more likely to develop technological capability and innovation. The cluster concept therefore brings about more an efficient development due to the collective efficiency of the small-scale industries in the cluster, the accumulation of knowledge and encouragement, the focus on regional development by creating opportunities for raising capital, as well as the increase in skills through joint efficiency. Small and medium enterprises and entrepreneurs can improve their efficiency via the clusters through horizontal cooperation, meeting the needs of large customers together, as well as through vertical cooperation and inter-corporate cooperation. Pre-competitive issues for local development related to the clusters certainly include the following: Who are the industry leaders in the local economy? Where are they associated/combined and concentrated? How can they be converted into an advantage for the industry? Which future benefits can be developed to encourage a faster and more effective local development? Considering the benefits outlined in the preceding paragraphs, it is clear that clusters offer many advantages in terms of efficiency, effectiveness and flexibility to the member companies comprising a cluster. As well as in the paper mentioned above, Porter (1990) states in another of his papers that he does not consider geographical proximity as a defining characteristic of clusters.

The local (regional) level primarily needs to:

- Initiate the gathering of industry leaders, champions and educational institutions to promote the idea of clusters for the purpose of forming a small initial fund of funds;
- Activate local centres for research, development and investment in projects and develop cooperation with the centres outside the municipality, promote the exchange of experiences with clusters in the region and interested associates as well as businesses abroad;
- Analyse and improve the logistics and transport, remove bottlenecks, lead special activities for the local government, customs, river authorities;
- Obtain foreign investments, form a centre for possible subsidies for certain problems related to clustering and co-financing;
- Make an analysis of competition and trends in supply, connections with suppliers and alternative suppliers for the missing inputs, the previously identified clusters of sub-contractors. The government should form some sort of brokerage service to help the clusters to find what they need;
- Diagnose, making the market potential and feasibility study of the domestic market (low prices but higher spending).

The focus of local governments should be on the clusters and on the benefits to the local development of the relationship between business, industry and support institutions. The local government should be a member of the cluster as a supplier of public goods and services, and it could also benefit from the development of clusters through the increases in tax revenues. It should also strive to increase the benefits of cooperation by providing the highest quality of services. The government could encourage cooperation through its influence on legislation, case law, and the organisation of training for professionals involved in partnership and cooperation.

Since the clusters tend to lead to a higher productivity, higher wages and increased salaries outside their own borders, local governments should promote the development of clusters as a visibly viable option.

Essentially, the local government needs to create a stimulating environment for the private sector in general, to reduce taxes, and to improve specific infrastructure investments in order to act through pre-financing as a precursor to the cluster development becoming a priority in terms of financial incentives, business premises, planning and building sites.

It is also extremely important to develop a system of support through:

- the education system that provides clusters with technology, engineering, skilled personnel and the possibility of continuous training and skill-building;

- the financial system that can enable joint ventures, microfinance, funds for beginners, capital investments into new equipment and working capital, micro-leasing to the chain of small suppliers;
- an innovation system that creates new technologies and provides access to new technologies, modern production processes, information;
- system infrastructure that supplies telecommunications, transport and removal of industrial waste;
- an appropriate legal system, less costly procedures, court decisions within the shortest time, socially effective control, environmental protection and natural resources, intellectual property rights;
- a higher quality of life, improving the local education system, personal security of citizens, the variety of leisure opportunities, and development of local attractions for businesses;
- increasing the corporate advantages for local firms by increasing the benefits of location, relationships within the local community, the motivation that distant rivals cannot achieve.

As the format of clusters (i.e. conditions to support their formation) is relatively demanding, the following options of cooperation are therefore put forward for consideration, not only for clusters but also for other, possibly looser forms of business networks.

*Mutual communication and information:* In order to develop the relationships between business people who deal with a specific chain of production or services, incentives are desirable, even by the local authorities. Their exchange of views and information, and in particular, the possibilities for joint work in the interest of all, is certainly useful from the standpoint of the local community. Of course, they could often find the reason for the contacts, but the initial impetus of creating a network can speed up the process and bring about good results fast.

*Joint research:* One possibility for the gathering is a joint research within a high school or research organisations that support or finance those companies interested. Potentially positive results of research create a basis for the long-term cooperation of the entire industry.

*Joint marketing:* When the producers have formed groups within one sector, it is already possible to organise joint marketing efforts toward consumers at the national level, as well as toward the domestic and foreign investors, in order to attract additional investments.

*Joint education of workers:* For one group at local level, it may be far easier to organise, with the government assistance, the training program for its employees. Training of the labour force can be partially

or fully financed by public sources, but the organisation and execution of training should be left to the existing educational system, which in some cases, particularly in smaller, geographically remote and less developed communities, can be achieved within the cooperation and joint performance with the private sector. A specific element of this topic is retraining. Many employees and even more unemployed people in Serbia have inadequate or outdated formal and informal qualifications. Because of the economic crisis during the 1990s and the transition of the economy, many occupation groups became redundant and unnecessary, and those people who belonged to them now find it difficult to gain employment. One such example is the metal or chemical profession. Workers with obsolete skills, for which there is an insufficient demand, should be re-qualified in accordance with the current trends and demand for labour. The task of improving the workers' knowledge and skills is the responsibility of the National Employment Service (NES), together with those interested in the private sector, but local authorities must also be included in the process, especially in cities where unemployment is high and where the NES is not working effectively.

Krugman (1999) states that working together in a cluster allows firms to operate more productively in sourcing outputs, accessing information, technology and needed institutions, coordinating with related firms and measuring and motivating improvement. Concerning labour, the firms in vibrant clusters have the opportunity to access the existing pools of specialised and experienced employees, therefore lowering their recruitment (search and transaction) costs. As the cluster principle is well-known in industry, it has the power to attract talented people from other locations. As well as skilled labour, a cluster can offer an extensive, specialised supplier base that can lower the transaction costs and the risk associated with distant suppliers. This can minimise the need for an inventory and eliminates the import costs and delays; furthermore, as local reputation is important, this lowers the risk of overpricing or renege on contracts. Geographical proximity improves communication with suppliers and gives suppliers an easier access to service support. This develops a relationship of better understanding of the needs through formal and informal contacts, more favourable contracts and a higher quality of specialised services. Another aspect of cluster cooperation is that of the linkages that develop within the cluster. Complementarities can appear in many forms, depending on the industry and business environment. Companies are pushing each other to achieve a synergetic effect on production, because their businesses

are lined in such a way that the good performance of one can enhance the development of the others. Porter (1998) underlines that geographically dispersed companies are less likely to recognise and capture such linkages. Another form is the coordination of activities across the firms to optimise their collective productivity. Complementarities between firms can help join bidding and scale benefits on contract tenders, or joint marketing of products and services. Companies in clusters benefit from the cluster's reputation as a whole, as well as the actions such as fair trades, trade magazines and marketing delegations. A cluster constantly invests in marketing of location and industry, thus attracting buyers and making a landmark for the region. Clusters are also of interest to buyers, as they offer a wider choice of suppliers, lowering the risk of cooperation and allowing multi-sourcing from a single location. They can stretch from manufacturers on one side to sales channels and customers on the other, involving governmental and other institutions like universities, standard-setting agencies and trade associations. The benefits for the companies within clusters are the multiple linkages and synergetic effects that help them to downsize costs, share knowledge, boost innovation and increase sales and exports. Cooke (2002) describes how the companies working with government institutions and other agencies already had influence on policy makers. However, synergy, as such ties are called by some authors, involves more intimate links with the government departments that may be lobbied or accessed to provide support or take soundings about the desirability of the regulatory change. This may be particularly important for Serbian clusters, as small enterprises are not able to influence policy makers significantly, nor fight for the benefits or protectionism in any form. As a cluster, however, they would have the negotiation power of larger companies and would be able to pursue important issues regarding their business industry. As the companies are operating in the same geographical region, the local rivalry is highly motivating and the performance is easier to measure due to the shared general circumstances. This is particularly important for financial institutions that can accumulate knowledge about the cluster and use it to monitor the performance. In order to become highly productive, companies have to employ sophisticated methods, use advanced technology, and offer unique products and services to the market.

This necessitates a good business environment represented by developed infrastructure, educated employees, loose government restrictions and a fair legal system. As previously mentioned, a close

relationship between the companies in the cluster bring about benefits to innovation because of the information flow, new ideas, market research and peer pressure. Buyers are often part of the cluster and through them, the companies can gain a better overview of the market situation and development. This gives them a head-start in early learning about evolving technology, component and machinery availability, services and marketing concepts. In addition, more mature clusters can offer the necessary flexibility and capacity, so that the companies can experiment at lower costs and wait for moments when innovation is favourable. On the other hand, clusters offer a significant local market that can secure the existence of a new company until it grows strong enough to outsource products and services to the outside of the cluster. In addition, financial institutions more willingly finance new companies within a cluster, having already developed a mutual understanding and trust. Clusters attract foreign direct investments and other outside firms who perceive the benefits of a specialised, leading edge business location. The state, often along with sectorial associations, can perform an important function in providing institutional support to industrial districts. At the national level, the state influences working of the industrial districts, both directly and indirectly, through the macroeconomic policy framework (Nadvi 1992; Schmitz 1995). Fiscal, monetary, trade, labour, industrial, sectoral and regional development policies, as well as infrastructural development programs, all affect the cluster production conditions.

## MATERIALS AND METHODS

Considering the specific economic situation of underdeveloped regions in Serbia and reserves about the availability of information necessary for research, many authors use a combination of the qualitative and quantitative data analysis (Saxenian 1994; Schmitz 1995; Nadvi and Barrientos 2004; Kesidou 2007). Some authors (Marsland et al. 1998; Brannen 2005) argue that the validity of the research data would be greater or better if both methodologies were used in combination. During the various investigations of the economy of the region, similar problems have been identified by other researchers: very little valid data is available; there is a lack of core data, an inefficient administration in enterprises, local governments, institutions and so on. The above mentioned problems necessitated the collection of data directly from businesses through the following steps:

- analysis of geographic areas and regions of Serbia (based on the official statistics data);
- analysis of secondary sources of information, official statistics and data of business associations as well as other relevant sources;
- analysis of the Serbian economy in underdeveloped regions and economic entities (companies, entrepreneurs, cooperatives, agencies, institutions etc.) and identification of the problems in the business (based on the questionnaires);
- interviews and cooperation on joint projects with domestic and foreign experts in the subject area;
- analysis of how the existing clusters in Serbia are functioning and testing the models for establishment and development of clusters.

Combining the quantitative and qualitative analysis can potentially be very useful in explaining the situation in which we find companies and clusters in less developed regions, as well as in answering important research questions (Brannen 2007). This research has used the data sets from different types of research in order to cover different but complementary aspects of the clusters' establishment and development. The qualitative analysis complemented by the quantitative analysis provides more information in depth as well as a comprehensive overview of the situation (Bresnahan et al. 2001). For the qualitative analysis in this particular research, results were used from surveys of companies, information on the regions in which firms operate, interviews with experts in the subject area (with the relevant representatives of companies, government agencies, experts from universities, cluster managers, representatives of scientific institutions and so on) as well as the results of specific projects. The survey was conducted in several stages and in cooperation with various institutions and experts. The primary research objective was to determine the potential for the establishment of clusters and to define the direction of the cluster development in the future. The primary study analysed 270 companies.

Initial analysis indicated the existence of certain limitations in the research:

- The obtained data were not always valid and accurate.
- Managers or employees did not always want to share business information.

The questionnaires therefore had to be adapted for the use of both qualitative and quantitative data analysis. A sample of 270 companies was divided into two parts. In the first part of the sample, the quantitative analysis was applied. The results obtained were checked and verified on the second part of the sample.

The second phase of research was done in collaboration with the Network of the E-development Association and GfK researching agency. This level of research aimed at determining the present state of the existing clusters in Serbia and their ability to connect with commercial areas in the region. The third phase of research was done in collaboration with fellow researchers, economy experts and business analysts from Serbia, Croatia, Slovenia, Italy, Hungary, Sweden, Germany, India and China. Through interviews, brainstorming, and joint participation in workshops and projects, the results obtained in the previous phase were analysed and checked as well as used to define the basic processes, activities, rules and recommendations that are an integral part of the research. The research was conducted in 2010 on a sample of 14 cluster initiatives both in Serbia and some other mentioned countries.

### **Primary research**

In the primary research, the goal was to review the state of the economy in the analysed areas (Central Serbia and Vojvodina Province) and to determine the potential and requirements inherent in establishing business clusters.

The primary research includes:

- analysis of the situation in the selected regions
- analysis of particular industrial segments
- defining business segments which may be interesting for further analysis in the domain of clusters
- selection of important companies from the selected business segments
- analysis of enterprises from the aspect of cluster development opportunities.

### **Substrate for the analysis of the selected region**

In order to get the most realistic results, it was necessary to collect data from the studied geographical area in relation to the following parameters:

- Geographic location
  - relief characteristics, climatic conditions
  - affiliation (land, water, air)
  - historical significance
  - geographical origin of investors and present partners
  - the position, place and role in the environment
- Demographic characteristics.
- Education, training, research/scientific/educational institutions, innovation.
- Resources (natural, material, human).

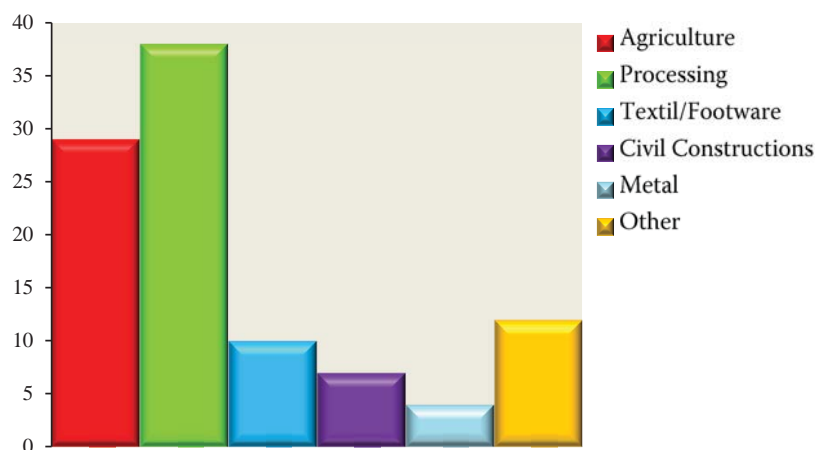


Figure 1. Sample structure

- Infrastructures (roads, railways, electricity, water supply).
- Industry and SMEs (small and medium enterprises)
  - type of industry
  - the structure and participation of individual industry segments – industrial zone
  - the structure, size and number of companies involved in certain activities
  - the most important enterprises in the industrial areas and their importance and influence on the wider geographical area. The characteristics of those geographic areas investigated significantly affect the results of research. The analysis of the potential industrial segments in the region presents a key element of research concerning the possibility of establishing a business cluster. By determining the real economic potential of the region, the study focuses on the business segments and those companies that could be a part of the cluster or have been already linked in some form of business network. During the research, the authors found some owners or managers of enterprises who hold a negative opinion about the establishment of the business networks or clusters, despite in fact being connected to a cluster. One of the reasons for such behaviour was the tendency to sustain the competitiveness of their own company within the cluster, or to prevent the creation of new competitive clusters.

### Analysis of industrial segments in the region

Analysis of the potential of the industry segments had two objectives. The first was that among several industry segments in a given region, the segment

with the greatest potential was to be chosen. The second was to identify those factors that are most important for the further development of the cluster. The results indicated that the greatest potential is held by industrial sectors that are connected with agriculture, particularly in the region of the Vojvodina Province (Figure 1).

If the data obtained in this research is compared with the data obtained in the research conducted in 2005/06 by the Research Centre – Centre for Strategy and Competitiveness in Stockholm, it can be concluded that Serbia has more in common with developing countries than with the countries in transition. In developing economies, there is a focus on agriculture and food in relation to the base processing industry. In transition economies, there is an equal mix of industries, including capital-intensive and high-tech industries (Figure 2).

The factors selected in the analysis as the most important suggested directions for further development in the process of clustering. The analysis of the economic segments' potential has shown which factors are critical, the most critical being the following:

- Ability to change the ways of using the existing technology (re-invention);
- Changes in laws and regulations;
- Seasonal variations in the industrial segments;
- Ease of entry into the market (barriers to market entry);
- Possibility of obtaining a loan;
- Technological changes in scope.

After determining the industrial segment with the greatest potential in a particular region, the selection took place of important companies in the selected industry segments and the companies they are cooperating with (suppliers, transport companies, equipment

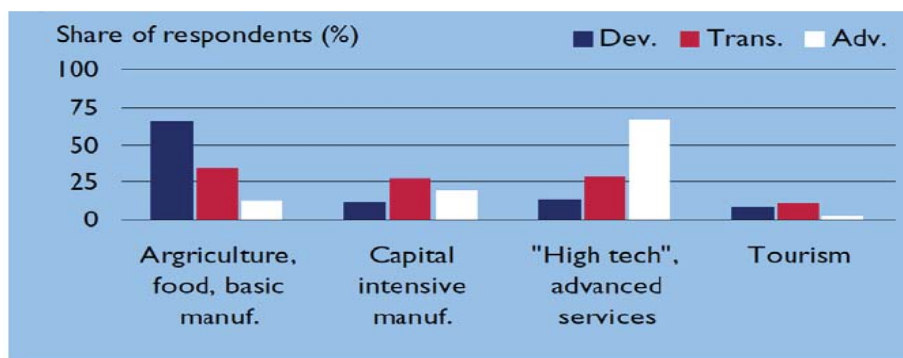


Figure 2. Development of business segments in relation to the development of the country

manufactures, education and scientific institutions, selling companies, supporting services). The major problems and existing links with other firms were then analysed in the selected enterprises, based on a questionnaire.

## RESULTS AND DISCUSSION

### Results of the primary research phase

In this research, 270 different business organisations were analysed, of which most were small and medium-size enterprises, agricultural cooperatives, agencies, and so on. Since the questionnaire included a number of quantitative and qualitative indicators, the following statistically processed results are shown for a number of indicators from 140 of the companies analysed (the first part of sample). These results were compared with the data obtained from the other group of companies (130 companies in the second part of sample). The results suggest the following conclusions:

- It is necessary to develop a business structure that will support the analysis of supply and demand in international markets and enable more suitable methods of purchasing, transportation, maintenance, providing repair services etc.
- It is necessary to develop a business structure that will provide adequate channels of product distribution globally and to ensure the collection and analysis of information on demand characteristics of new markets.
- It is important to strengthen the strategic development of those areas with comparative advantages, in order to avoid the unnecessary import of materials, parts or finished products and thus to enhance the competitiveness of the economy (Porter 2003).

The general model of the establishment and development of clusters will integrate these elements through the following mechanisms: application of modern technology, boosting entrepreneurship development, training and development of stakeholders and development of marketing and branding of the region.

In practice, people tend to react negatively to any kind of change initially. Connecting enterprises and cluster development is a new practice, and those engaged in business are very careful about it. Although the research shows that 90% of them agree with the idea of companies forming a cluster, when compared with the data obtained from another group of companies, the data shows that only a very small number of companies are really ready to be connected into a cluster. The data showed that 76% of respondents anticipate stagnation or declining revenues in the future. The qualitative analysis led to the conclusion that the reasons for this lie in the enterprises' very low level of competitiveness. Companies are losing the existing markets and it is very hard for them to fight for the new ones. Introducing companies into the clusters could significantly increase their competitiveness. The data obtained in the survey shows very poor conditions in terms of the IT. Almost 25.7% of the companies that were analysed do not have any internet connection, while 40% have a dial-up connection that is unfit for the office use. Only 18% have a cable internet that has a large enough capacity to enable business use and the exchange of documents. The results of the present study also speak about the level of knowledge and the awareness of the needs and potentials of the IT technology and the importance of using the Internet, as 72.9% considered that the existing connections are appropriate. In such an environment, it is difficult to be competitive. The data confirm the previous conclusions. Although only 2.9% believe that this

way of doing business is not applicable, only 13% actually use e-banking and as many as 32.9% lack information about it. The results show a significant underdevelopment of the sales channels. Given that most of the enterprises interviewed were small and medium-sized, it is evident that they have limited opportunities for advertising, as well as for the development of alternative sales channels or exhibiting at fairs on so-called trade shows. This should take into account the structure of the products or services offered, as not all products are suitable for sales through alternative channels. On the other hand, it is evident that only 4.3% of companies attend such fairs, which also holds an important message. The detailed analysis showed that the reason for this inability to develop alternative distribution channels or to participate at the fairs is because of the financial reasons, liquidity problems, a lack of skilled workers and a lack of quality information. The influence of the environment on corporate performance can be significant. From the standpoint of employment possibilities in the companies, most requirements exist for the workers in manufacturing (55% of respondents), then in the domain of sales (35.7% of respondents) and finally for the managers (26.4% of respondents). If one takes into account that companies still employ a significant number of workers in production or sales in relation to the number of managers, it is clear that there is a great amount of the unused potential for new managers, specialists in marketing (23.6% of respondents) or engineers (19.3% of respondents). This data also indicates how to direct the energy for the future professional training of labour and in which domains the cooperation with educational institutions should be developed. One piece of very important information obtained by the qualitative analysis is related to the significant problems of small and medium-size enterprises in developing countries or countries in transition – the separation of the functions of ownership and management, i.e. the transfer of the rights of control and governance of the managers by the company owners. More than one quarter of the companies have a need for a new management. These figures show realistic problems that occur in the labour market. Although the official reports claim that Serbia holds the advantage of the low costs of labour and skilled specialists, this is not quite true. The research has shown that Serbia has significant problems with skilled labour, given the lack thereof; the statistical data indicate a lack of the appropriate personnel in the production, management and commercial operations in the Serbian economy. The data indicates the need for a

stronger cooperation between educational institutions and economy subjects which can be achieved by grouping the demands of the economy, as well as through the harmonisation of educational plans and programs with the clearly defined requirements of the economy. The general model of cluster development would have to target this segment.

The data obtained on the categories that are crucial for the successful business operations of companies have much to tell us about the current state of the Serbian economy. The primary importance of the production functions is as the main creator of a new value. Secondly, it is a managerial function that creates an adequate environment for business operations and directs the company to achieve better results compared to the existing capabilities. Third in rank is the selling function, which allows the product or service to find a way to the customer. However, the research shows a significant problem in the business, namely a lack of development processes and innovation. That is reflected in the fact that only 6% of the companies believe that engineering has a significant stake in the business enterprise.

#### **Results of the second level of research – analysis of the existing clusters**

There are currently over 30 cluster initiatives in Serbia. The most important are the following: AC Serbia – a cluster of auto parts manufacturers; BIPOM Cluster in Belgrade; a health tourism cluster in Kanizsa; Istar 21 Cluster in Novi Sad; JATO Cluster in Subotica; “Royal Holiday” Fund in Kraljevo; MEMOS cluster in Indjija; Tourism Cluster Srem in Ruma; Passage Cluster in Pancevo; Netwood Cluster in Kragujevac; Shoemakers in Knjazevac; Cluster ICT NET in Belgrade; Tourism cluster of the Palic micro regions, in Subotica; SPA cluster; Agro-cooperative cluster, in Horgos; Fungiland, in Vrsac, Aluminum cluster in Pancevo; Sombor’s Farmsteads Cluster in Sombor. The research was conducted in seven clusters of Serbia such as: the BIPOM cluster, the FUNGILAND cluster, the JATO cluster, the MEMOS cluster, the KANIZSA cluster and the cluster of ICT NET (Network), which was created by merging the two existing clusters: the Serbian Software Cluster and the Cluster for integrated electronic systems – “Embedded.rs”. The total of 34 companies participated in the survey, located in different industries and regions, therefore forming a good representative of the general picture. The survey was conducted at the company level, while the analysis part has been carried out at the cluster



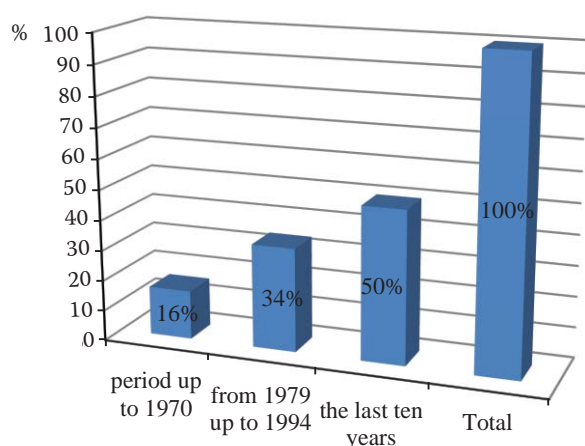


Figure 3. Year of establishment

level in order to detect the significant similarities and differences in their responses and attitudes. Information that was collected in the survey was processed in the SPSS program, and before the data analysis, the error checking and data “cleaning” was conducted. In order to find significant differences in the descriptions of the relationship between the responses from different clusters and different companies, the Pearson Chi-Square tool was used. The most common variants of quantitative analysis are the Pearson Chi-Square test and the Chi-Square test of the probability ratio. This test the null hypothesis that the frequency distribution of certain events observed in the sample is consistent with a particular theoretical distribution.

If the period when the cluster was established is analysed, we can see that 16% of the surveyed companies were established before 1970, while 34% were founded in the period 1979–1994. The great majority of companies (50%) were established in the last ten years. Concerning the number of members within the clusters, 75% of the clusters have about 20 registered members, 17% of them between 70 and 100 members and 8% over 100 members. It should be taken into account that most clusters are registered upon the

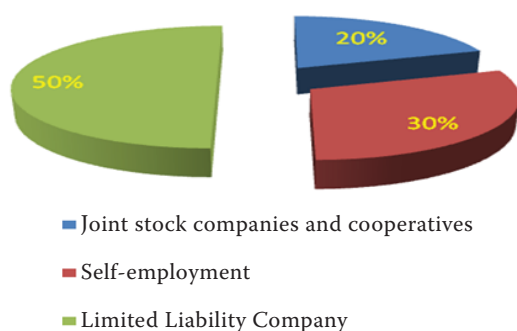


Figure 4. Form of organisation

recommendation of the Ministry which has set the requirement that the cluster must have a minimum of nine businesses and three institutions, directly influencing the number of clusters. Clusters which have a larger number of participants are mostly developed as professional associations.

Concerning the organisational status, 50% of the companies which were analysed are limited liability companies, 30% run by self-employed individuals, and about 20% are joint stock companies and cooperatives (Figure 3, 4).

The companies have shown significant differences in terms of their response to the question regarding the type of companies that form clusters in Serbia. Most of the sample companies are limited liability companies (about 50%). For example, in the BIPOM cluster, all companies are of this type. The sample shows that the different clusters consist of different types of companies, depending on the type of industry. The FUNGILAND cluster has three companies with one owner – the producers of mushrooms, which are actually privately owned farms. On the other hand, the MEMOS cluster has 5 private workshops that belong to the cluster. Usually, larger companies were previously state – owned and were then privatised, which was the situation in two companies of the JATO cluster. There is no general rule as to what types of companies form the clusters in Serbia, because there are all different sizes, types of ownership and types of organisations.

The majority of companies (90%) have their core business in production and the delivery of services. Also, most of the companies that are part of the clusters in the sample are manufacturing companies, but there is also a relatively high percentage of service companies. Some companies offer both production and services, but only one company within the analysed clusters offers the IT products and services. The KANIZSA cluster clearly indicates that it is not an industrial cluster, but rather the combination of services and tourist industry, spa centres (spas) and hotel chains. The conclusion that most of the clusters are the production type highlights the opportunities in the future for the development of the network services clusters.

Out of all the cluster member companies, 95% produce the final products and only 5% of them produce semi-products. In 90% of the cases, computers are used for accounting purposes, the Internet and electronic mail, and a very small number of cluster member companies use the computer for the e-commerce and technological purposes (Figure 5, 6).

Serbian companies use computers mainly for accounting and during the manufacturing process. About 25% of the companies use computers to communicate,

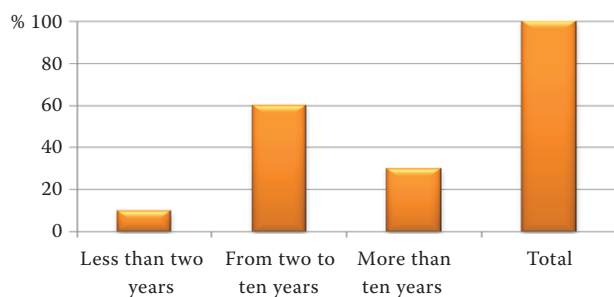


Figure 5. The shape of the final product

and only one for e-Business. Serbian companies do not use all the features of the IT systems, leaving the potential for further development in the automation of some processes.

About 60% of companies have at their disposal the equipment which is between 2 and 10 years old, 30% dispose of the equipment older than 10 years and only 10% of companies use the equipment which is less than 2 years old.

In these responses, there were significant differences among the clusters in the sample. The ICT NET (Network) Cluster, the BIPOM and the KANIZSA clusters have mostly a brand new machinery and equipment, while the MEMOS cluster has mostly the used and older technology. It is evident that the FUNGILAND cluster has invested into new machinery and equipment, suggesting that the agricultural sector in Serbia is striving for prosperity and stable growth. The JATO cluster includes companies that have both new and old machines. From the global point of view, 17 companies responded that their tools are of a new brand, which could indicate that clustering has had positive effects on the process of production and sales modernisation.

Regarding the question concerning competition, there were no significant differences in responses between the clusters. Most of the surveyed companies (60%) believe that there are several competing companies in their region and they do not feel threatened, nor do they attach a great importance to encountering the competition. Another interesting opinion is that 35% of companies feel that they have no direct competitors in the range of their services and products. This situation can be seen as quite alarming, since these companies do not feel the pressure of the stimulus, and they are therefore unwilling to invest into know-how and innovation. If we analyse the response at the level of clusters, again we can see differences between clusters. It is obvious that the FUNGILAND cluster is an example of a new business in Serbia, since mushrooms were not traditionally grown in the past. This cluster was established when the producers gathered around a large company that

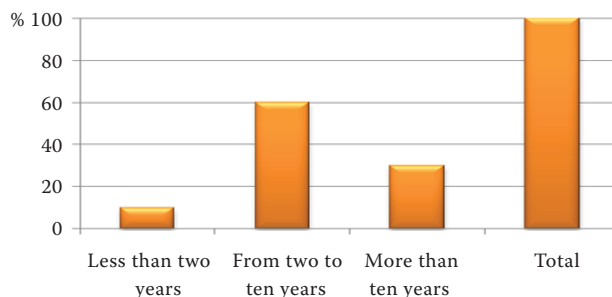


Figure 6. Age of equipment

deals with processing (treatment), to meet the needs of the Serbian market and in order to export to the neighbouring countries. Another aspect is that the FUNGILAND and KANIZSA clusters are located in small industrial districts – Kanizsa and Vrsac. In contrast, the BIPOM, the ICT NET (Network), the JATO and the MEMOS clusters are located in the developed industrial districts – Belgrade, Subotica and Indjija, in which there are many different industries. Certainly, these second group of clusters have more “substitutes” in their local markets, and the competition is much stronger.

About 45% of the surveyed cluster members responded that there is some form of cooperation in solving the common problems, while 40% stated that there is no such relation among the members of the cluster, and 5% answered that they participate in this way in the creation of strong competition in the market. The Pearson Chi-Square index shows that there are no significant differences between clusters. Only 2 of 33 companies responded that they have contact with the competition and cooperate more than necessary in order to overcome legal and manufacturing problems. In the FUNGILAND, JATO and MEMOS clusters, more than half of the companies have a contact with the competition, but they are at the grass root level and do not involve cooperation. On the other hand, 40% of companies do not cooperate, they do not share information or work on the common problems. In this way, they have to use more resources to achieve fewer benefits. In the current stage of the market development in Serbia, the cooperation between competitors is very weak and there is no mutual trust.

On the question about suppliers, 45% of respondents reported that they have suppliers from other districts, 35% from the same district and 30% from the same city. This question allowed multiple answers, as the suppliers may come from the local environment, as well as from the other regions and outside of the country. For example, the companies from the BIPOM cluster are dealing with suppliers from the same city of Belgrade and the region, but

they also have suppliers from distant areas. The MEMOS and JATO clusters use materials (plastic and metal) which have to be imported, so they have some regional vendors and suppliers from distant areas. Generally, it is evident that the clusters in Serbia are still failing to attract suppliers to be closer to them, which does not mean that they do not use the scale economies in the procurement organisation. Finally, 60% of respondents have suppliers which reside in the category of small and medium-size enterprises, and 30% in the category of large companies. Concerning this issue, the clusters had significantly different responses. Depending on the industry, clusters have different channels of procurement, quality standards, dynamics of procurement, stocks (inventories) of materials and guarantees. It is interesting that 42.9% of respondents did not want to answer the question, while 62.5% of respondents did not want to declare their suppliers.

Almost all surveyed cluster members have an equal number of customers in the city, county and other countries. In comparison to the previous question regarding the cluster suppliers, the companies have been apparently successful in attracting customers to their proximity. More than half of the companies in all clusters have organised sales in all three categories – in their cities, region and other regions. Proximity to the customer base may result in a better understanding of market needs and trends. It is interesting that all companies in the JATO and BIPOM clusters have sold their products in distant regions – this probably amounting to exports. It is highly unlikely that all these companies had the ability to operate at a distance before they joined the cluster.

Up to 80% of the customers of the surveyed clusters belong to the categories of small and medium-size enterprises and 20% belong to the category of large enterprises.

Only one third of the companies are selling products to big corporations, while 80% are selling to the entrepreneurs and mid-size companies. This data provides an insight into how the clusters are covering the market, and how they can be developed and improved. The second conclusion would be that every cluster has at least one company that does business with corporations. It is obvious that the companies need to work more with the corporations, given that

they bring the possibility of significant and long-term business.

More than half of the surveyed cluster companies (55%) responded that the competition in their territory has an average level, while 20% said that it is strong, 15% said it was unfair and 5% answered that it is weak or absent (Figure 7).

It is interesting that 30% of the cluster companies responded that it is important for them to exchange information with competitors, 16% responded that their cooperation is essential in the defence of "personal interest" as a lobby in the bodies (organs) at all levels, 16% answered that it is important for staff training, while 16% replied that it is important for the joint use of infrastructure and 18% saw such cooperation as essential for improving the conditions for access to credit. In regard to this, companies have expressed what kind of cooperation they are most interested in. These are important motivational factors for companies in Serbia in terms of inclusion in clusters. Again, the companies provide a variety of answers, and approximately 30% are interested in all of methods of cooperation. Members of the MEMOS cluster are obviously aware of the opportunities for cooperation, and are ready to develop ties with other companies in order to resolve the usual legal and political problems, including presentations to banks, investment funds, and an association for the development of employees. This is extremely important in cases where companies want to train employees in the use of new machinery, and when the training sessions are expensive and usually held abroad. Similar responses can be seen regarding the sharing of machinery, indicating that companies recognise the benefits of cooperation, sharing of production capacity and use of the same technology. Almost half (45%) of the surveyed cluster member companies responded that they maintain relationships with scientific/research institutions, and the other 55% answered negatively. In each cluster, there are companies that are involved in cooperation with universities and research institutes, but also there are enterprises which do not engage in such collaboration. It is clear that in the current situation most of the companies are not strong enough to invest in innovation projects, so they do not intend to cooperate with universities and R & D institutions. Business

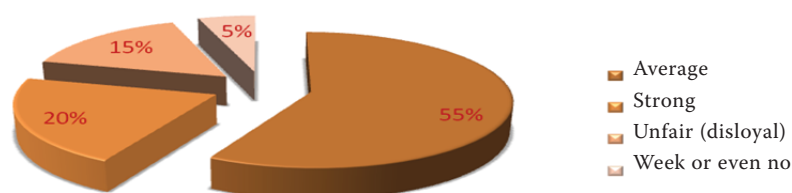


Figure 7. Form of competition

relationships with these potentially important institutional partners are not yet sufficiently developed in Serbian companies and clusters.

On the question concerning participation in trade fairs, 45% of the sample companies responded that they participate regularly in trade fairs and 55% of them do not participate. Concerning international economic cooperation, 30% responded that they are interested in international economic relations in order to obtain new partners as the potential investors, 40% are interested because of exports and the ways of organising production, 15% are interested due to the new product design, 10% are interested due to the possibility of joint ventures (investments) abroad, and 5% because of imports.

## CONCLUSION

An important part of the research presented in this paper is the position and role of the existing clusters in the economic development strategy of underdeveloped regions in the Republic of Serbia. One of the first dilemmas in the establishment and development of the clusters is the motive or expectations of the companies participating in the clusters. For the companies that have already been in the cluster or have expressed a desire for the cluster networking, the main motives are a better approach to international markets and the establishment of cooperation with other companies, organisations or clusters. The next important issue is to strengthen the supply chains, that is to say, strengthening links between suppliers and customers, because they believe that costs can thus be reduced and competitiveness increased. Thirdly, it highlights the significance of clusters in a volatile (unstable) business environment, where a cluster provides a greater safety, reduces uncertainty and creates conditions for the establishment of certain rules of operations and cooperation. An expectation was that the innovative development and the easier access to technologies could be one of the important factors, but on the scale of the motives it took the fifth place, behind the need for education. The reason for this is that the companies do not see, in the short term, the benefits that arise from such cooperation. Cooperation is in fact even avoided, through the fear that it might lead to stealing of the ideas. In this respect, it is necessary to develop specific protection mechanisms as well as the confidence among the participants of the cluster. For an establishment of clusters, an element of tradition is important in the cooperation, such as artisan cooperatives, agricultural cooperatives and

commercial complexes in Serbia, all of which had a lot in common with the modern concept of clusters. Companies in Serbia have a long history of cooperation. The significant influence on the development of clusters has been through the chambers of commerce, such as in the case of the Auto-Cluster of Serbia, or through the support that different ministries or international organisations have provided to the companies. Clusters are also very important for the local community. In the local market, the companies are motivated to unite themselves into the clusters in order to remain competitive and to ensure future contacts. Without development, local enterprises would start to disappear, and that would negatively affect the standard of living in the local community. When the cluster is established on strong foundations, it uses the local community as an engine of development. This is the case with Indjija, a small town in the Vojvodina Province within Serbia that has managed to attract a large number of companies in a small town with 30 000 inhabitants. The local city government has supported the development of entrepreneurship and created a simple and flexible local operating system. Indjija has hosted several foreign direct investors which successfully employed people from Indjija and the surrounding towns, even from the capital city of Belgrade. A higher economic activity in the region leads to higher revenues from the taxes collected. Participation in major projects and sustainable development are also high-ranking motivational factors for the micro and small companies to form clusters. For instance, thanks to the cluster, small companies from undeveloped areas can be present at a business fair or trade show in Berlin, and they can sign a contract or find a partner. This, without the clusters, would be very difficult or impossible for them. The problem of the clusters in the less developed regions is still the structure of management that governs companies, most being managed by the entrepreneurs but not by the professional management. Business owners do not yet recognise the benefits of hiring skilled and competent managers, but they prefer to conduct their businesses on their own. They have therefore often been confronted with problems in understanding all the benefits that clusters can offer to their companies, and they are also less flexible and willing to accept changes. Innovations in the clusters are a significant factor of success, but in the case of Serbia they are at a rather low level. Clusters have not yet evolved to the level of the common research and development, except for the JATO cluster which has a department for development. Given that clusters are a relatively new way of organising business in Serbia, the com-

panies within the clusters have not yet developed a strong sense of mutual cooperation and trust within the clusters. Enterprises in developing countries are usually not aware of all the advantages offered by the cluster. Usually, the short-term motivation factors for cluster establishment – such as training, going to fairs, obtaining the cash funds, business associations and so on – prevail. It was also noticed that there is a great difference between the needs of the companies and the willingness of the ministries and local governments to finance them. The reason for this very frequently lies in the lack of legal regulations and legal framework for financing the actions of clusters. In practice, the clusters often arise as a result of horizontal cooperation between enterprises. Institutions and service companies are involved primarily on the basis of the recommendations of the state or because of a personal acquaintance, so the clusters in many cases look like the trade and professional associations. In this way, the cluster loses its flexibility and lowers its real competitiveness. Without a proper cooperation within the supply chains, the cluster initiative results neither in lower prices, nor in the increased performance, the reliability of delivery or a higher quality of products and services. Better ties with suppliers are one of the benefits that members have within the clusters. Clusters have a greater bargaining power and they can reduce the costs of inputs and transportation, and maintain good quality – in essence; they act as one big company. They can generate a wider range of choices and adjust their output requirements. Development of good relations with members of the cluster is of crucial importance, but also between the cluster and the environment. The combination of good communication and mutual understanding brings about a synergistic effect and a shared vision. This further implies the ability to relocate certain functions to the level of clusters – such as marketing, accounting, legal affairs, PMO (Project Management Office) and logistics. The companies which are members of the cluster can obtain all of these functions at significantly lower prices.

## REFERENCES

Bathelt H., Malmberg A., Maskell P. (2002): Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Danish Research Unit for Industrial Dynamics, Economic Development Quarterly*, 14: 97–107.

Brannen J. (2005): Mixing methods: the entry of qualitative and quantitative approaches into the research process.

*International Journal of Social Research Methodology*, 8: 173–184.

Brannen J. (2007): Working qualitatively and quantitatively. In: Seal C. et al. (eds.): *Qualitative Research Practice*. Sage, London.

Bresnahan T., Gambardella A., Saxenian A. (2001): Old economy inputs for new economy outcomes: cluster formation in the new silicon valleys. *Industrial and Corporate Change*, 10: 835–860.

Cooke P. (2002): *Knowledge Economies*. Routledge, London.

Fujita M., Krugman P.R., Venables A. (1999): *The Spatial Economy: Cities, Regions and International Trade*. MIT Press, Cambridge, London.

Kesidou E. (2007): *Local Knowledge Spillovers in High Tech Clusters in Developing Countries*. Technische Universiteit, Eindhoven.

Ketels C. (2003): *The Development of the Cluster Concept: Present Experiences and Further Developments*. Paper prepared for NRW Conference on Clusters, Duisburg, Germany.

Ketels C., Lindqvist G., Sölvell Ö. (2006): *Cluster Initiatives in Developing and Transition Economies*. ISBN 91-974783-2-6. Available at [www.cluster-research.org](http://www.cluster-research.org), [www.sse.edu/csc](http://www.sse.edu/csc)

Krugman P.R. (1991a): Increasing returns and economic geography. *Journal of Political Economy*, 99: 483–499.

Krugman P.R. (1991b): First Nature, Second Nature, and Metropolitan Location. NBER Working Papers 3740, National Bureau of Economic Research, Inc., Cambridge.

Marsland N., Wilson I., Abeyasekera S., Kleih U. (1998): *A Methodological Framework for Combining Quantitative and Qualitative Survey Methods*. Report for DFID Research Project R7033, Department for International Development, University of Reading.

Maskell P., Kebir L. (2005): What Qualifies as a Cluster Theory. Working Papers No. 05-09. Danish Research Unit for Industrial Dynamics (DRUID), Copenhagen.

Nadvi K. (1992): Flexible Specialization, Industrial Districts and Employment in Pakistan. Working Paper No. 232. ILO World Employment Programme, Geneva.

Nadvi K., Barrientos S. (2004): *Industrial Clusters and Poverty: Towards a Methodology for poverty and Social Impact Assessment of Cluster Development*. United Nations Industrial Development Organization, Vienna.

Porter M.E. (1979): How competitive forces shape strategy. *Harvard Business Review*, 57: 137–145.

Porter M.E. (1990): *The Competitive Advantage of Nations*. Free Press, New York.

Porter M.E. (1991): Towards a dynamic theory of strategy. *Strategic Management Journal*, 12: 95–117.

Porter M.E. (1998a): Clusters and the new economics of competition. *Harvard Business Review*, 76: 77–90.

Porter M.E. (1998b): *Clusters versus Industrial Policy*. On Competition. HBS Press, Harvard.

Porter M.E. (2000): Location, competition, and economic development: local clusters in a global economy. *Economic Development Quarterly*, 14: 15–34.

Porter M.E. (2003): The economic performance of regions. *Regional Studies*, 37: 549–578.

Saxenian A. (1994): *Regional Advantage: Culture and Competition in Silicon Valley and Route 128*. Harvard University Press, Cambridge.

Schmitz H. (1995): Small shoemakers and fordist giants: tale of a super-cluster. *World Development*, 23: 9–28.

Arrived on 12<sup>th</sup> October 2011

---

*Contact address:*

Gajo Milan Vanka, Wim Heijman, Wageningen University, Costerweg 50, Building no. 400, 6701 BH Wageningen, The Netherlands

Zorica Vasiljevic, University of Belgrade, Nemanjina 6, 11080 Belgrade, Serbia

e-mail: gajo.vanka@telenor.rs; gvanka@leomail.tamuc.edu; vankagajo@yahoo.co.uk; Wim.Heijman@wur.nl;

vazor@agrif.bg.ac.rs; vazor@sezampro.rs

---