



CLUSTERS AS A CHANCE OF THE GROWTH OF INNOVATIVENESS OF THE WOOD SECTOR COMPANIES IN POLAND

KLASTRE AKO KĽÚČOVÝ PRVOK INOVATÍNEHO RASTU SPOLOČNOSTÍ DREVOSPRACUJÚCEHO PRIEMYSLU V POĽSKU

Magdalena HERBEĆ

Abstract

The aim of this paper is to assess the possibilities of growth of innovativeness of the wood sector companies through utilisation of synergy effects connected with participation in clusters operating in the wood market and in its environment. Bearing in mind the presented concept of clusters, basic goals of and barriers to innovation activity of the wood sector companies in Poland are identified. The research was mostly based on the desk research method.

Keywords: clusters, innovation activity, wood sector in Poland.

Introduction

Companies operate in conditions of constantly growing competition on the domestic and foreign markets. The level of innovativeness of production processes and manufactured goods is an important factor in the process of building competitive position in the market. In the case of the wood sector its specific nature has a significant bearing on the drive of companies to achieve the desired economic condition and market position. The basic raw material used by the analysed companies, i.e. wood, is a natural raw material and its supply, to a large degree, depends on natural factors. Diverse level of modernity of particular production processes utilised by the wood sector companies, i.e. from traditional woodworking techniques and technologies to highly technologically advanced processes (found for instance in the furniture industry), also deserves one's attention.

The drive for innovativeness growth in globalisation conditions may prove that multiplanar relations of companies with the entities in their environment become more and more important. Therefore, a contemporary market player should perceive other players not only as parties to buy-and-sell contracts, but also as co-operators and prospects partners. A so-built network of connections decreases the probability of company exclusion from the flow of information and knowledge, thus from access to modern technological solutions. On the other hand, the named factors may be reflected in the level of business innovativeness. Hence, this paper was written with a view of assessing the possibilities of the growth of innovativeness of the wood sector companies through utilisation of synergy effects connected with participation in clusters operating in the Polish wood market and in its environment. The paper characterises the wood market (with a special emphasis placed on basic goals of and barriers to innovation activity of the wood sector companies in Poland) against the presented concept of clusters and their influence on company innovativeness. In the paper the wood sector is understood as an area of economy that encompasses the wood industry (i.e. manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and





plaiting materials – section C, division 16 of the Polish Classification of Businesses (PKD)), the pulp and paper industry (i.e. manufacture of paper and paper products – section C, division 17 of PKD) and the furniture industry (i.e. Manufacture of furniture – section C, division 31 PKD) [19].

The concept of clusters

There are many definitions of clusters, but according to the most popular, formulated by M. Porter, a cluster, alternatively called a bunch, is understood as "geographically proximate group of interconnected companies, specialized suppliers, service providers, companies operating in related sectors, and associated institutions (e.g. universities, standardization bodies, and industry associations) in a specific field based on commonalities and complementarities (...)" [20-21].

The economic science revealed an increased interest in clusters and business networks at the end of the 20th century. Such organisational structures were seen as a chance of improvement in competitiveness and innovativeness of companies, and eventually a chance of economic growth of the country. Moreover, creation of clusters and business networks is a manifestation of companies' reaction to changes occurring on modern market, such as establishment of global companies, shortening of product life cycle, and faster access to information.

In recent years developmental policy based on clusters has also gained popularity. A manifestation of this is taking clusters into consideration when national and international strategies are formulated. Clusters are also a subject of discussion at the European Union (EU) level, for EU regards clustering as one of nine strategic priorities of effective promotion of innovation and thus supports pro-cluster policy. In 2006 EU adopted Community Strategic Guidelines concerning cohesion in the period 2007-2013, in which member states and regions are encouraged to, among other things, promote strong clusters as part of their strategies of economic reforms [5]. In Poland in September 2012 a document entitled "The lines and principles of cluster policy in Poland by 2020" was published. This document is recommendation of the Working Group on cluster policy [11] and is based on the principles adopted in effective governmental documents, which, among other things, point out to the need to support economic development based on regional and local specialisations, especially within the framework of cluster initiatives [13-14,18]. Ruminating on the role of clusters as stimuli of company innovativeness, one should emphasise that the newly published document assumes that strengthening of innovativeness and competitiveness of the Polish economy is a strategic goal of future cluster policy. This goal is to be achieved based on intensification of co-operation, interaction and knowledge flow within clusters, and stimulation of new cluster creation. Moreover, the desired situation is to be created also through more focused and integrated public intervention, tailored to the needs of clusters [11].

Analysing the importance of clusters for the improvement of company innovativeness, one should stress that previous research indicates differences in cluster operation in developed countries and developing countries. In the latter the depth and range of clusters is often smaller than in developed countries [21]. Therefore, herein presented possibilities of clusters, in terms of their influence on the improvement of company innovativeness, may be less visible in economic practice of developing countries than in that of mature economies.





Innovativeness in the wood sector in Poland

In economics the term "innovation" is treated as a phenomenon closely connected with creation of knowledge and its diffusion to production of material goods and services [7]. When assessing the innovativeness of the wood sector companies, one should keep in mind specific features of this sector, for the wood sector is described as a mature industry, which description stems from the fact that it utilises a natural raw material, which can be processed relatively simply¹. This, to a large degree, limits introduction of significant modifications and increase in the share of modern techniques and technologies. However, it does not mean that there is no possibility of improvement in products and production technologies, especially when wood is utilised in crumbled form. It should be stressed though, that the supply of wood as a natural raw material also is important, for this feature contributes to, among other things, constant stimulation of the demand for raw wood material. On the other hand, the ecological nature of raw wood material, which is visible at every stage of the production process (from logging to final utilisation), also is conducive to demand for technological processes as well as for improved products [10].

The wood sector is also characterised by very diverse industries, with specific production processes and different assortments of manufactured products intended for defined customers. On the other hand, the diverse production processes are reflected by various levels of modernity of utilised techniques and technologies. Moreover, from the point of view of the possibilities of innovative development of the wood sector, the fact that in Poland this sector is characterised by large dispersion, is of importance. In 2011 the share of micro-enterprises (i.e. business entities employing up to 9 people) within total number of business entities within the wood and furniture industries was the same and equalled 91% in both cases, and within the pulp and paper industry it was 85% [25]. This kind of company size structure may be interpreted two ways. On the one hand, majority of small and medium-sized enterprises in the sector evidences the strong individual entrepreneurship and stimulates competitiveness. On the other hand, business entities operating on a smaller scale often have smaller capital resources, which may make it difficult for them to meet market challenges, such as for instance the presence of giant companies in the market.

Generalising, within the Polish wood sector innovations are basically technical and technological in nature and concern mainly changes occurring in material structures of products. One can discern such trends as: i) striving to obtain products of new and improved physical and chemical properties and better parameters in terms of quality and durability; ii) modifying the properties of wood products in order to find more applications for them; iii) strengthening the phenomenon of material substitution; iv) striving to save on raw material, energy and labour [10].

Outlay on innovation is a sign of the interest of companies in innovation activity. In 2010 in the wood sector this outlay amounted to MPLN 960.6 and it was 5% of outlay on innovation in the processing industry. The greatest outlay on innovation activity was observed in the pulp and paper industry (i.e. MPLN 389.5), and the smallest in the wood industry (MPLN 254.8), whereas the outlay in the furniture industry amounted to MPLN 316.3. The

¹ According to the Organization for Economic Co-operation and Development (OECD) the classification of industries of 1997, which is based on technology share, considers the wood sector (and industries within it, including the furniture industry and paper industry) a low technique industry. The category of low technique encompasses industries in which outlay on R&D is 1% or less of the sales value [16].





noticeable smallest volume of investment in innovations observed in the case of companies within traditional wood industry (mainly the sawmilling industry) stems from specificity of processing within this industry, for the companies within traditional wood industry utilise solid wood, i.e. a natural raw material that does not require significant modifications, and thus application of modern techniques and technologies [10]. The outlay on innovation activity in the case of more concentrated pulp and paper industry, characterised by a smaller number of companies, but more technologically advanced production process, is more than half greater than in the case of traditional wood industry. It is worth adding, that public funds only accounted for 8% of total outlay on innovation activity in processing industry [4].

Despite the differences in the scale of outlay on technical creation in the wood sector and processing industry, its structure was similar in both cases. However, it should be noted that the share of this outlay in individual wood industries was diverse. In the wood sector the greatest percentage of investment in innovation was intended for machines and machine tools. In the furniture industry this index amounted to 58%, in wood industry to 72%, and in pulp and paper industry to 83% (compared to processing industry – 53%). In terms of outlay on R&D the furniture industry stood out (13% compared to pulp and paper industry 0.5% and wood industry 5%). It should be stressed that the analysed group of outlay on innovation activity takes into consideration the following categories: purchase of knowledge from external sources, purchase of software, investment outlay on buildings, structures and land, investment outlay on machines and technical devices, personnel training connected with innovation activity, marketing concerning new and significantly improved products, and R&D activity [4].

The innovation activity of companies within the wood sector, as in processing industry, was mainly aimed at increasing the assortment of products and services, improving product or service quality, entering new markets or increasing market share, increasing production capacity, and improving production flexibility. Substitution of obsolete products or processes, reduction of unit labour costs, reduction of unit material intensity, mitigation of burden to the environment, and improvement of health and safety at work were less significant for the companies as regards their innovation activity [4]. In the period 2008-2010 in the wood sector more than half of companies active in the sphere of innovations, pointed out to broadening of product and service assortment as an important goal of innovation activity (in processing industry it was 54%). Other important goal was the improvement of the quality of products or services (more than 45% of the wood sector companies active in the sphere of innovations, and 50% in processing industry). Entering new markets or increasing market share through innovation activity was on the agenda of 43% of companies within the pulp and paper industry and 43% of companies within the furniture industry, whilst the wood industry companies accounted for 36% of companies active in the sphere of innovations. The reason for this may be specificity of production in the wood industry stemming from the dependence on direct access to raw wood material and its prices. In this case the low degree of raw material processing and narrower assortment offered by traditional wood industry are also of importance.

Similar to basic economic activity, also innovation activity is not free from various hindrances. In the case of the wood sector companies main barriers to innovation growth were the following: i) economic factors (which encompassed: lack of financial resources in a company or company group, lack of financial means from external sources, too high innovation costs); ii) factors connected with knowledge (i.e. lack of qualified personnel, lack of information on technologies, lack of information on markets, difficulties in finding partners





for co-operation in the field of innovation activity); iii) market factors (i.e. market captured by dominating enterprises, uncertain demand for innovations). The rest of the factors, i.e. lack of the need to carry out innovation activity and lack of demand for innovations, were less hindrance as regards innovations [4]. It is characteristic that in all the industries of the wood sector the greatest hindrance to innovativeness growth were economic factors, which were pointed out by almost every third wood sector company on average in the period 2008-2010. Market factors were also important barriers, i.e. market captured by dominating enterprises and uncertain demand for innovations (20% of the wood sector companies). It is worth noticing that economic and market factors were the main barriers to innovation activity also in processing industry.

The role of clusters in improvement of the innovativeness of the wood sector companies in Poland

Clusters operate in various areas of economy and, depending on the features characteristic of individual economy sectors, one can see the differences between innovativeness levels and technological advancement of cluster members. In the wood sector first clusters in Europe were established in Scandinavian countries [2]. Despite the increasing interest in business networks and clusters, there still is a cognitive gap in the field of cluster operation in economic practice, including in the Polish wood sector². It is estimated that there are 173 clusters and cluster initiatives in various economy sectors in Poland [1]. This means an increase in their number by 44% compared with 2008 and evidences the intensive development of such structures in Poland [17,24]. In 2010 6 clusters and 7 cluster initiatives were identified in the Polish wood sector [1]. In the period 2008-2010 approximately 0.2% of total number of companies within the wood industry, 0.2% in furniture industry, and 0.3% in pulp and paper industry co-operated in the field of innovation activity within the framework of cluster initiative. It is worth stressing that one tenth of companies, which jointly worked on innovations in the wood industry (i.e. 8.6%), were associated in cluster initiatives. In the case of the pulp and paper industry and furniture industry this number was even smaller, for it was respectively 5.4% and 5.8%. For comparison, in processing industry 0.7% of total number of companies co-operated in the field of innovation activity within the framework of cluster initiative, which accounted for 11.5% of total number of enterprises co-operating in the field of innovation activity [4].

The subject literature emphasises that cluster participation is in various ways beneficial to companies. This is connected with relatively better conditions of company development that are found in a cluster. A manifestation of this is, among other things, access to information, specialist knowledge and new techniques and technologies. Amongst the benefits of cluster membership there also is the possibility of co-operation (in various ranges) with other cluster members, including entities rendering specialist service and scientific institutions. Due to the nature of relations between cluster members, i.e. co-operation while at the same time maintaining competition conditions, there is a belief that clusters influence also company innovativeness³. One of the factors which implicate innovativeness within clusters is competitive pressure between cluster participants. The comparisons made between companies create in companies the need to distinguish themselves in the market. As a result, the pressure

² Hitherto the subject of clusters in the wood sector was discussed in literature to various extents [9,15,17,24].

³ The subject of relations between innovativeness and interactions between organisations in networks was addressed in literature to various extents [3,8,22-23].





for innovations grows. On the other hand, through contact with cluster members, companies have easier access to information on, for instance, customer needs, progress in technique, availability of components and machines, service and marketing concepts etc. [21]

From the point of view of the improvement of company innovativeness, creation of co-operation conditions for cluster members, who can involve their resources in execution of common projects (for example working on new product or service), is of great importance, for more and more often innovations are created as a result of new application of already possessed resources [12]. This fact is especially important to the Polish wood sector, the structure of which is dominated by micro- and small enterprises. In general, companies of that size have limited capital and are characterised by deficit of human and technological potential. Joining resources of enterprises of similar business operation profile in order to execute common projects reduces unit outlay, especially in small and medium-sized enterprise sector (SME sector). Co-operation between cluster members may make it easier for enterprises to overcome economic barriers and other connected with attainment of individual goals of innovation activity. Thanks to common activities companies may minimise not only the costs (through their distribution among a group of companies and/or use of public support), but also the risk of innovative project failure, i.e. the factor that often discourage single entities from taking up such initiatives. Also co-operation in the field of production and marketing is helpful for the wood sector companies, which desire to use innovation to broaden their assortment of products and services, improve their quality, and enter new markets. Despite a number of available possibilities of co-financing of investment in new technologies, especially financing of R&D from external sources (national and foreign), still a small percentage of companies use this form of financing. In the period 2008-2010 in the area of industrial processing companies, which received public financing for innovation activity from the programme supporting national, regional and cluster co-operation, accounted for 3.1% of companies using support programmes. In the wood sector this number was similar and equalled 4.5% of companies in the wood industry and 2.0% in furniture industry. No such company was observed in the pulp and paper industry [4,12].

Variety of entities involved in multiplanar relations also is of great importance to the development of companies and the improvement of innovativeness of cluster participants. Especially the presence of scientific institutions in clusters may contribute to increasing the role of these entities as information sources, especially for micro- and small enterprises. It is estimated that national companies seldom co-operate with scientific institutions in order to develop new technologies [12]. This also concerns the wood sector, where the share of outlay on R&D in the structure of outlay on innovation activity is relatively small. This may evidence, among other things, lack of interest in co-operation with scientific institutions. Therefore it is stressed that cluster membership provides an opportunity to establish cooperation with scientific entities operating in the company environment (for instance such cooperation may be established after technological needs of a group of companies are jointly identified). Moreover, it is important that the group of micro- and small-sized enterprises is dominated by imitators, and not by innovators implementing state-of-the-art technologies [12]. Comparing this to the Polish wood sector, which is dominated by micro- and small-sized enterprises, one may think that the interest and involvement of these entities in innovation activity may be increased, among other things, through their participation in training, seminars, conferences, and through execution of projects together with scientific institutions.

The increase in utilisation of the cluster potential may also be facilitated by national or regional development strategies based on clusters. An example may be the Bayern region in





Germany. Research carried out in Germany and concerning the influence of cluster-based policy on the innovation level in the region in the period 1990-1999 revealed that the introduction of such programme increased the possibility of company innovativeness in target industries from 4.6 to 5.7 basis points and decreased expenditure on R&D by 19.4% on average [6]. Increased possibilities (for companies) of obtaining access to external knowledge sources and properly qualified R&D personnel, and of co-operation with scientific institutions from public sector also were observed in the analysed industries [6].

Analysing the importance of clusters for the improvement of company innovativeness, one should also mention that sometimes participation in a cluster may a barrier to innovations. Such situation especially may appear when entities associated within a cluster are characterised by the same attitude towards competition, for it is harder for the cluster members to implement new ideas, when group beliefs are strengthened. When the cluster has operated for a relatively long time, it may be more difficult for its member to identify the need for change, and they also may be afraid of results of changing previous relations with other companies. In situation, where clusters avoid drastic innovations due to the possibility of losing former resources, they put a cluster member "(...) in a position not worse than that of a company operating in isolation (...)" [21]. However, it is worth noticing that internal stiff rules confining innovations also may become one of the reasons for the cluster decline [21].

Conclusions

Changes occurring in environment of business entities mobilise them to improve utilised technologies, enhance product quality, customise products etc. In the Polish wood sector innovations are basically technical and technological in nature and concern mainly changes occurring in material structures of products. The low level of innovativeness of the wood sector is, to a large extent, a result of utilised production processes, including relatively simple wood processing (especially in traditional wood industry). However, one may expect to see manifestation of the innovativeness of the wood sector industries in the form of improvement of products and production technologies, especially in industries utilising wood in crumbled form. Membership in clusters may enable companies to partially reduce wood market-specific barriers to the growth of innovativeness and attain goals assumed for innovativeness. The activities of clusters for the improvement of company innovativeness are of special importance to small and medium-sized enterprises, which dominate the structure of the wood sector in Poland. Access to information, knowledge and technology, which is offered by clusters, may increase the interest and involvement of small and medium-sized enterprises in innovativeness in innovativeness.

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Contact:

M.Sc. Magdalena Herbeć Wood Technology Institute Wood Industry Economics Department Winiarska St. 1 60-654 Poznań, Poland e-mail: m_herbec@itd.poznan.pl