CROATIAN WOOD INDUSTRY – CLUSTERS, COMPETITIVENESS AND PERSPECTIVES OF DEVELOPMENT IN THE FRAMEWORK OF EUROPEAN UNION MEMBERSHIP[1]

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Summary

The aim of this paper is to determine the possibilities of development of the Croatian wood industry and wood industry clusters after joining the EU. It analyses and compares the situation in the wood industry in the markets of the EU and Croatia: the importance and characteristics of the wood industry and clusterization in the wood industry. Results show that there are many clusters in the EU wood industry, the most frequent occurring in the Italian economy which is well known for its furniture. Clusters in the EU are big organizations with many enterprises and prominent specialization while Croatian clusters include a small number of firms. Recommendations for increasing competitiveness based on this research include: building a network of wood clusters in Croatia and connecting it with similar clusters in the EU; directing the Croatian wood industry toward production of furniture with high added value and toward increased use of wood as a renewable energy source (production of pellets).

Key words: wood and wood-based industry; EU; Croatia; clusters; competitiveness.

1. INTRODUCTION

Croatian accession to the EU has brought about the fundamental advantage of a completely liberal access to a market of 500 million people. It is necessary to contin-

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uously build elements of competitiveness at all levels (company, industry and national economy) in order to create the conditions for achieving better results and success on the global market. Competitiveness is a broad term that is determined by macroeconomic determinants (monetary determinant, fiscal policy, exchange rate policy, education of the population, etc.) on the one hand, while on the other hand it is determined by the characteristics of enterprises (size, strategy, customers, related and supporting production, technology, employees, etc.). The concept of competitiveness is presented in detail and explained by Porter (1990, 1998). The development of a market economy encourages the formation of a large number of small and medium enterprises that represent a dynamic adjustment to market requirements. However, at the same time it is much harder for them to achieve a greater market share and they are more often affected by competition with larger and stronger companies. The concept of clusters incorporates a number of enterprises, as well as supporting scientific research institutions, chambers, etc. that can, through common activities and cooperation, contribute to competitiveness. The cluster policy tries to act on: strengthening the competitiveness of enterprises, strengthening the competitiveness of regions, improving the structure of economic activities and connecting public, business and scientific research sectors into networks.

Wood-based industry in Croatia, just like in other European countries consists of a large number of small and medium-sized enterprises that face difficulties in reaching a good market position and becoming competitive. Wood industry is a resource-intensive industry and as such does not have a high added value (compared to ICT, pharmaceuticals, etc.), but it is important for the Croatian economy (notable share in employment, export and rural development). (Croatian Chamber of Economy, 2010; Pirc, et al, 2010)

Croatia has encouraged the development of clusters through financial support where part of the clusters was formed through a bottom-up approach (the idea was launched by the members themselves), but a top-down approach has also been applied (Croatian Export Offensive) where 6 clusters was to be created (in order to increase Croatian exports).[3]

The strategy for the development of clusters was adopted in 2011 and it contained many goals among which we emphasize: strengthening clusters and cluster members, business internationalization and export growth, efficient use of program funds and EU funds. (Ministry of Economy, 2011b)

It can be observed that the cluster policy has become an integral part of the medium and small enterprises policy. The cluster policy has been recognized as an important factor for increasing competitiveness, but there are certain difficulties in connection to monitoring clusters and their effectiveness for its members. Because these difficulties have still not been systematically taken into consideration, the exact,number of active (functioning) clusters cannot be stated with certainty.[4]

[3] According to the Ministry of Economy, Labour and Entrepreneurship the Project Clusters - alliance to success was launched in 2005 and in the period 2005 - 2011 more than 46 initiatives was co-financed by 31.9 million kuna. These clusters bring together 504 companies and 25,063 employees (Ministry of Economy, 2011a).

[4] According to the data from the Croatian Chamber of Economy there are 54 clusters in Croatia.

In the EU there are a number of initiatives and policies that encourage the formation and promotion of clusters. They are usually part of national policies, but also joint projects at the EU level are developed with the aim of networking clusters and increasing technological readiness such as: *European Cluster Excellence Initiative, High Level Advisory Group on Clusters*, *European Cluster Alliance, European Cluster Policy Group, European Cluster Organisation Directory, European Cluster Collaboration Platform, European ProCluster Association* (Tijanić, 2011). Programs such as Horizon 2020 (ex FP7) and the Structural Funds also stimulate cluster activities.

This applies generally to the cluster policy framework in the Republic of Croatia and the EU.

The aim of this paper is to determine the possibilities for developing the Croatian wood industry and wood industry clusters after Croatian accession to the EU. The research focuses on analysing the wood and furniture sector in the EU with an emphasis on cluster development in the Croatian wood industry. We would like to answer the following question: how the Croatian wood industry can benefit from EU accession. The issue of the impact of technological development, innovation, and regional community in which a cluster is formed (Novakova, 2011) should not be neglected, but these issues will not be covered in our analysis. Research is carried out by using the following methodology: analytical presentation of the importance of wood industry, data synthesis on the number of clusters, the regional distribution of clusters in wood industry in the EU-27, and a case-study on the example of Italian clusters in the field of furniture production.

This paper is organized as follows: section 2 presents a review of relevant literature with an overview of legal framework and development of wood industry in the Republic of Croatia and European Union. Section 3 gives the overview of the number and development of clusters in the EU's wood industry with a special emphasis on the Italian case, and the forth section presents the conclusion with recommendations for further development of the wood industry and clusters in the EU framework.

2. LITERATURE REVIEW – ABOUT WOOD INDUSTRY IN CROATIA AND IN THE EUROPEAN UNION

2.1. Characteristics of wood industry in the EU

Trends on the world wood and wood products market are influenced by globalization, where developed economies are faced with losing competitiveness versus developing economies which gradually take a more prominent position. The change in the power on the global market resulted in decreased employment in the EU and U.S. while China and South-East Asian countries take a dominant position. China is the largest furniture exporter in the world. Its wood furniture industry has become an important part of the country's forestry economic development. Country's furniture industry has influenced the formation of three big industrial areas, namely, the Eastern Pearl River Delta, the Yangtze River Delta, and the Bohai Rim Region (Yang et al, 2012).

Ratnasingam and Ioras (2003) warn about the sustainability of the Asian wooden furniture industry due to stagnating productivity and rising exports of low-value. Contract furniture is not sustainable in the long-term as other cheaper manufacturers emerge. Industry liberalization with the use of skilled workers, and not industrial policy, are the strategic elements for sustainability.

The EU has approximately 180 million hectares of forest and other wooden land, which accounts for approximately 5% of the world's forests. Forested area of the EU is slowly increasing (contrary to what is happening in many other parts of the world). Europe's wood industries face on-going structural changes induced mainly by technological innovation, expansion and relocation of production, first of all to the new member states and neighbouring countries of the EU. The output in furniture grew considerably in Eastern European countries, while Western countries lost ground (Clutier et al. 2007, Drayse 2011).

Rametsteiner et. al (2006) have researched the effects of globalization on the position and challenges of European forestry industry. Globalization of enterprises and markets is shading away the borders of national forest clusters and intensifying competition between nations and governments in the field of future investments and location of production This industry is affected by globalization through internationalization of forest-based industry, changes in the world market (new competitors from Southeast Asia, cheaper production in new member states), climate change, limited resources, importance of innovation and ICT technologies, sustainable competitiveness etc. This author pointed out the problems of this industry: decreased employment in the forestry sector, with related effects on rural areas; low attractiveness of forestry, decreased importance of the forest sector in national economies; decreased economic attractiveness of forestry in specific conditions, further liberalization, climate change threats, energy security issues, as well as societal changes, forest industry relocation, globalization of sourcing natural resources. Fragmentation of forest ownership, more specifically small management units, without economies of scale and scope is a major obstacle to an economically viable and competitive forestry in the EU. Significant regional differences in forests and forestry in the EU imply that there is no uniform pattern or solution. 7 types of forestry are present in EU27 and the transition countries of Eastern Europe are presented as: "…regions dominated by restitution issues, weak, broken, private forestry tradition, weak infrastructure, and uncompetitive domestic forest industries in Eastern Europe". The Southeast European region's forest sector will enjoy substantial future growth because of increased productivity and lower production costs.

Forests are affected by a broad array of EU policies and initiatives which currently promote sustainable forest management with the following objectives:

- create and preserve jobs and otherwise contribute to rural life;
- protect the environment by preserving soil, minimising erosion, purifying water, protecting aquifers, improving air quality, absorbing carbon, mitigating climate change, and preserving biodiversity;
- monitor the state of forests to meet environmental agreements;

- improve the competitiveness of forest-based industries in the internal market;
- promote the use of wood and other forest products as environmentally friendly products;
- reduce poverty in developing countries by furthering forest law enforcement, fair trade conditions and halting deforestation and illegal logging (Eurostat, 2013).

Here we should highlight "The EU forest action plan" from 2006 that underpins support for sustainable forest management and the multi-functional role of forests. The plan is a framework for forest-related measures and is used to coordinate EU initiatives with the forest policies of Member States. The "Green paper on forest protection and information in the EU: preparing forests for climate change" published in 2010, aimed to stimulate debate concerning the way climate change modifies the terms of forest management and protection, and how EU policy should develop as a consequence.

Forestry is also an important part of the rural development policy in the EU (Eurostat, 2013). The following EU member states have more than half of their land area covered by forests and other wooded land: Finland, Sweden, Slovenia, Estonia, Spain and Latvia.

Regarding the stock of forest and other wooded land in EU-28, the biggest shares belong to: Germany (14.3%), Sweden (13.8%) and France (10.6%). The EU produced 433.7 million m^3 of roundwood and 101.2 million m^3 of sawnwood in 2011. Sweden produced the most roundwood (71.9 million m^3), followed by Germany, France and Finland (each producing between 50 and 56 million m^3). Total production of roundwod in 2012 was by 7.3% lower than the peak level recorded in 2007. Germany and Sweden were leading sawnwood producers and accounted for 21.3 and 16.1% respectively of the EU27 total output in 2012. It must be noted that the use of wood as the source of energy has a growing importance in the framework of the Europe 2020 strategy. One of its goals is to increase efficiency of energy use and increase the use of renewable energy. Among renewable energy sources, biomass plays an important role and wood and wood waste provides 47.8% of energy from organic, non-fossil materials of biological origin. EU-27 is the largest global producer of wood pellets (10.5 million tonnes in 2012) and the production rose by 57% between 2009 and 2012 (Eurostat, 2013).

About 455 000 enterprises were active in wood-based industries across EU-27, which represents more than one fifth (21.4%) of manufacturing enterprises.[5] They are characterized by economics of scale and many downstream wood-based industries had a relatively high number of small and medium-sized enterprises. The trends in EU's wood industry are decreasing: the total number of enterprises fell by 9.1% between 2005 and 2010. The biggest decrease was registered in furniture manufacturing (-13.3%). Wood-based industries generated 1 590 billion EUR of gross value added (8.5% of man-

[5] Wood-based industries cover a range of downstream activities including woodworking industries, large parts of furniture industry, pulp and paper manufacturing and converting industries, as well as the printing industry.

ufacturing industry) and employed 3.6 million persons (11.6% of manufacturing total). In the period 2000-12 manufacturing employment in EU-28 fell by 17.0% while the largest losses among wood-based industries were recorded in furniture manufacturing (28.6% fewer persons employed). (Eurostat, 2013)

Table 1: Main indicators for wood-based industries, EU-27, 2005 and 2010

Acitivity (NACE Rev.2)	Number of enterprises (1000s)		Gross value added at factor cost (EUR billion)		Number of persons employed (1000s)	
	2005	2010	2005	2010	2005	2009
Manufacturing	2 322	2 130	1 630	1 590	34 644	31 000
Wood-based industries (16+17+18.1+31)	500	455	152	135	4 388	3 588
Manufacture of wood and wood products (16)	198	184	35	31	1 280	1 030
Manufacture of pulp, paper and paper products (17)	20	21	40	41	730	658
Printing and services related to printing (18.1)	133	120	41	32	978	821
Manufacture of furniture (31)	150	130	36	30	1 400	1 080

Source: Eurostat (2013).

By analysing recent data, a slight recovery in the wood products market can be detected: after the crisis and the fall in production in 2008 and 2009, a slight growth in the production of roundwood and sawnwood can be noted.

The development of wood industry is not equally distributed among EU member states, and cluster development has a different significance in the EU.

Viitamo and Bilas (2002) warn about the change in the EU forest sector after the Eastern enlargement and develop a holistic approach to discern various forms of industrial competitiveness in selected candidate countries. Forest industry has a different significance and while its importance is the highest in Latvia and Estonia (a quarter of manufacturing industry), followed by Slovenia, Poland, Lithuania, and Slovakia (share between 11% and 15%) with decreasing trends. They pointed out the need for: promotion of balanced growth of forest-based industries that is of special importance for meeting the requirements of the Kyoto Protocol; facilitation of technology diffusion and spillovers from the West to the East and the implementation of appropriate FDI policies and effective country specific restructuring programs; creation of a science oriented policy-research framework to enhance the competitiveness of the European forest sector. Kies et. al. (2009) and their case study reveal decisive impacts of the forest sector on regional employment especially in rural areas of Germany. Regional industrial clusters and pairwise patterns of co-agglomeration of sawmilling, wood-based panels, wood-based construction and furniture industries are identified in geographical space. The pronounced spatial variability within Germany's forest sector is linked to regional

factors influencing geographic location, size and regional association of the industries under study.

By applying shift-share, Osses et al. (2013) find that regional trends of the value chain of the European wood-based panel and furniture industry move in the opposite direction from overall economic trends. Countries of Eastern Europe are faced with large-scale structural changes in employment in wood-based industries, which reveal themselves as much more dynamic in comparison with their equivalents in Western Europe. This is linked to considerable shifts of employment from West to the East.

Christensen et al. (2012) examine how to monitor the development of clusters and develop tools to analyse the performance of their work. Phases in which clusters can be found differ between world renowned clusters and clusters in transition.

Gorynia et al (2007) found that companies in the furniture cluster in the region of Wielkopolska (Poland) are afraid to enter into co-operative relationships, especially with competitors. They do not see either the benefits accruing from co-operation with rivals or a connection between locally available resources and their competitive position.

Many studies have been conducted on the example of the Finnish forest industry that is highly competitive and characterized by a high-tech approach. Salo, Gustaffson and Mild (2004) derive a prospective evaluation of Wood Wisdom, a national research program for the Finnish forestry and forest industries and outline a framework where summative and formative evaluations are linked to three levels of the innovation system. Viitamo (2003) indicates the role of new technologies (developing more advanced ICT products) with the purpose of creating competitive strategies in the international market. The report examines the relationship between services, manufacturing, technological progress and organizational factors, which generate competitiveness in industrial clusters. Growth is most effective when service-intensity of the production processes and the knowledge intensity of services can be increased. Finland has a remarkable share of wood industry in global terms and in export orientation, thus making internationalization the main characteristic of Finish forest industry. It outperforms the rest of the world by all indicators of relative comparative advantage indexes or exports per capita. Internationalization through exports is reaching its limits and the main strategy of growth has shifted to international acquisitions and mergers. In the case of forest industry three areas that should be improved/changed were pointed out: revision of governance structures and increase in organizational flexibility (removing obstacles for external procurement of services and reorganizing publicly produced services); revision of corporate strategies of the forest industry to create more innovative and creative transaction relations on the service markets; in the domain of technological competitiveness the Government should be more active in securing long-term availability and development of the skill base.

2.2. Wood industry in the Republic of Croatia

Croatia has a long tradition of wood industry, abundant high-quality resources (almost half of the Croatian territory is covered by forests and forest land) and

high-quality human resources. It is a resource which is abundant in that country, and because of this it has a comparative advantage in that branch. However, it is not enough to succeed in foreign markets, because the performance depends not just on the availability of resources but also on subtle factors, such as investment in knowledge, technology or design. Croatia is a small country and a small furniture producer in the EU which accounted for 1.2% of the EU roundwood production in 2011. Wood industry in Croatia accounts for about 0.8% of GDP, employs one-third of employees in the manufacturing industry (20968 employees in 2012) and accounts for 7% of Croatian exports. This sector is dominated by small and medium enterprises, with 1390 companies and only 6 large enterprises. Export and import of wood products are mostly oriented toward Italy, Germany, Slovenia, Austria and other EU member states. The main problem is that 64% of wooden export consists of raw wood material (sawn timber and elements) while furniture export accounts for only 35% of total wood export. The share of furniture import is 61%, while wood and wood products represent 39% of total wood import (Croatian Bureau of Statistics, 2013). In 2009, domestic and foreign demand decreased which resulted in the reduction of export and import in wood industry. An important characteristic of wood industry is low consumption compared to other EU member states which have a trend of increasing consumption of wood products (especially Finland, Austria).

In the following section economic indicators of wood industry are analysed: production, exports, imports, consumption, sales on domestic market (PDP-DT), share of sales on domestic market (HD) and the base and chain indices for the period 2008 to 2012 (according to the methodology provided by Pirc et al., 2010). Data about production have been collected from FINA reports - they are originally expressed in HRK but we have recalculated them into EUR (using the annual average exchange rate HRK/EUR of the Croatian National Bank). Data about export and import come from the Croatian Bureau of Statistics (Statistical Yearbook) and are originally expressed in EUR. It is important to note the change in classification: the earlier classification (NKD 2002) of wood industry contains sections DD 30 and DN 36. The new classification (NKD 2007) contains the following sections: 16 (Manufacture of wood and of products of wood and cork, except furniture; manufacture) and section 31 (Manufacture of furniture).

Table 2: Main economic indicators of wood processing and furniture market from 2008 to 2012

Year	Production in mn EUR		Export in mn EUR		Import in mn EUR		Consumption in mn EUR		PHPDT		HD	
	16	31	16	31	16	31	16	31	16	31	16	31
2008	644.3	505.1	351.1	249.9	272.4	331.6	565.5	586.8	293.1	255.2	51.8	43.5
2009	530.7	436.6	273.0	197.1	202.4	260.0	460.1	499.4	257.7	239.5	56.0	47.9
2010	537.8	413.8	304.9	225.8	175.1	219.9	408.0	408.0	232.9	188.1	57.1	46.1
2011	584.3	430.5	351.7	238.1	178.6	228.5	411.2	420.8	232.6	192.3	56.6	45.7
2012	649.5	419.3	366.7	239.0	162.6	217.9	445.4	398.1	282.8	180.2	63.5	45.3
Mean	589.3	441.0	329.5	230.0	198.2	251.6	458.1	462.6	259.8	211.0	56.7	45.6

Source: author's calculation.

Table 2 presents the main findings in the period 2008-2012: production in section 16 has slightly increased by 0.8%, while production in section 31 has decreased by 17%. Export in section 16 has increased by 4.4% and in section has decreased by 4% (Table 3). Import for sections 16 and 31 have decreased by 40% and 34%, respectively (Table 3). Production, consumption and trade trends can be seen in Figures 1 and 2.

Figure 1: Production and consumption of wood industry in Croatia in period 2008-2012

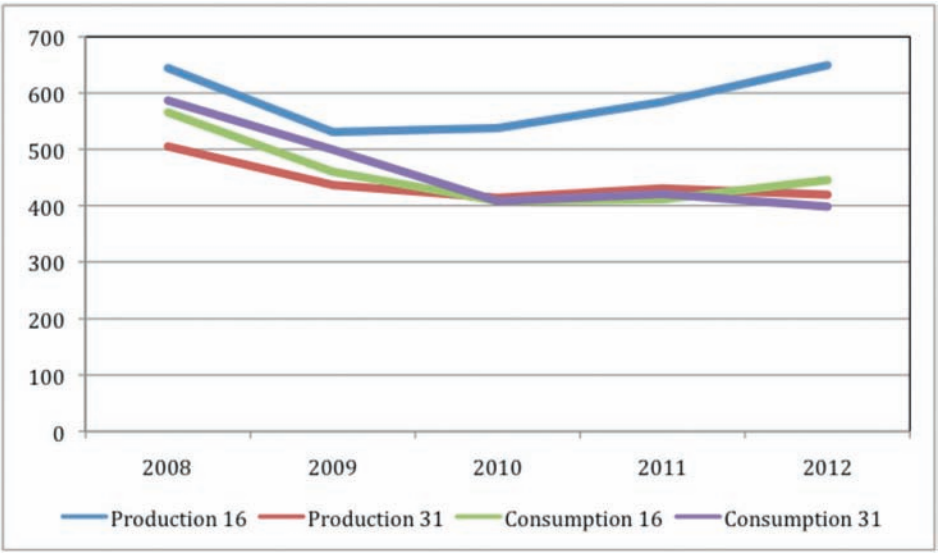

Figure 2: Production, export and import of wood industry in Croatia in period 2008-2012

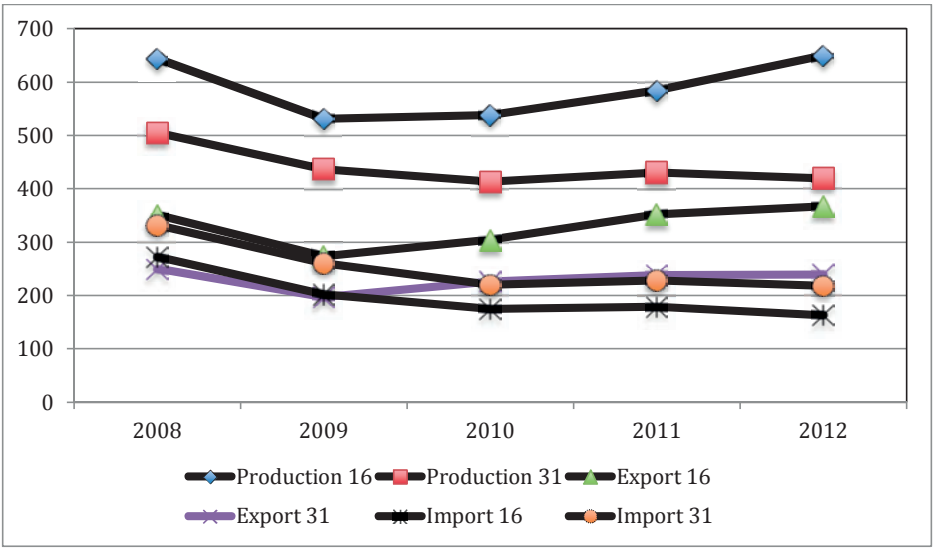

Table 3: Base and chain indices of wood industry in the period 2008-2012

Base indices; 2008=100												
Year	Production		Export		Import		Consumption		PHPDT		HD	
	16	31	16	31	16	31	16	31	16	31	16	31
2008	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2009	82.4	86.4	77.7	78.9	74.3	78.4	81.4	85.1	87.9	93.8	108.1	110.3
2010	83.5	81.9	86.8	90.3	64.3	66.3	72.2	69.5	79.5	73.7	110.1	106.0
2011	90.7	85.2	100.1	95.3	65.6	68.9	72.7	71.7	79.3	75.4	109.1	105.1
2012	100.8	83.0	104.4	95.7	59.7	65.7	78.8	67.8	96.5	70.6	122.5	104.1
Chain indices												
2008	…	…	...	…	…	…	…	…	…	…	…	…
2009	82.4	86.4	77.7	78.9	74.3	78.4	81.4	85.1	87.9	93.8	108.1	110.3
2010	101.3	94.8	111.7	114.5	86.5	84.6	88.7	81.7	90.4	78.5	101.9	96.1
2011	108.6	10.0	115.3	105.5	102.0	103.9	100.8	103.2	99.9	102.3	99.1	99.1
2012	111.2	97.4	104.3	100.4	91.0	95.3	108.3	94.6	121.6	93.7	112.3	99.1

Source: author's calculations.

From Table 3 it is obvious that in comparison with 2008, the highest change in 2012 happened in import and consumption. Consumption was reduced by 21% (for section 16) and 32% (for section 31) and import fell even more prominently. Logically, the results is orientation of a higher share of domestic production toward the domestic market- the HD (base) indices indicate the rise of 22.5% for section 16 and 4.1% for section 31.

Following a huge fall in production, export, import and consumption, in 2009 the market began a slow recovery evident from chain indices.

Efforts to create a framework for functioning and guiding the development of wood industry have appeared in recent years. Several should be pointed out:

1. Operational programme of development of wood processing industry for the period 2006 - 2010 which tried to stop the trend of exporting sawn timber and move to stronger exports of finished products (through the project "Wood comes first" ("Drvo je prvo") financed by 8.4 million kuna.
2. *Development Strategy* of the wood industry until 2012 was adopted in order to protect the furniture from the East. Under this program 222.4 million HRK of aid was allocated for energy saving, environmental protection, education.
3. Operational programme of developing the wood processing industry for the period 2011 - 2014 centred on creating a multiple increase in the value of timber products through high degree of finalization characterized by high quality, design and distinctiveness. The long-term goal was to develop wood processing and furniture manufacturing as an economically successful, profitable business with balanced, competitive and sustainable development, one which follows world trends. Funds available for grants amounted to 284.5 million HRK.

4. Strategic guidelines for the development of the wood-processing sector 2013-2020 (MINGO, 2013) define priorities for developing the sector:
   a. develop optimal models of procurement and supply the wood-processing sector with sufficient amount of high-quality raw materials,
   b. improve the business environment and strengthen the competitiveness of the wood-processing sector;
   c. strengthen excellence in the wood-processing sector and intensify investments in final processing through research, technological development and application of innovation and advanced technologies (KET);
   d. develop human capital, knowledge and skills;
   e. invest in the development and promotion of design and
   f. build local wood industry brands.

SWOT analysess of wood industry in Croatia was performed by Vlahinić-Dizdarevic and Uršić (2010) and the Institute of Economics (2009) and they indicated the following strengths: raw material base, comparative advantages, tradition in wood production, export orientation. Weaknesses were much more numerous, and we will mention only some of them: poor structure of production, fragmentation of production, low labour productivity and profitability, low investments, falling behind in technological development, absence of brands, etc. Notwithstanding many weaknesses, there are also many opportunities for the development of this industry: attracting foreign direct investment, connectivity and building partnerships, cluster development, increase in exports of finished wood products, etc. We should emphasize the positive impact of Croatian EU accession on the increase in demand and output. Threats include: unfavourable economic and investment policy, uncontrolled expansion of sawmill capacity, poor use of raw material, bad structure of sectors, lack of brands, structural changes in competitor countries (Ministry of Agriculture, 2013).

Figurić, Greger and Posavec (2004) recommend the shift in the Croatian wood industry toward strategic alliances which can foster growth within the world industry, and create opportunities for small countries to preserve their authenticity and identity. They analyse both the opportunities and disadvantages of economic alliances. Interviewed subjects express their positive attitudes about entering strategic alliances both locally and internationally.

Croatian wood industry has recognised the need for forming clusters and there are several of them: Wood Cluster of Northwestern Croatia, Cooperative "Slavonian oak" (Slavonski hrast); Wood Cluster headquartered in Delnice; Cluster "Wood-furniture" ("Drvo-namještaj") proposed within the framework of the Croatian Export Offensive; Cluster "Croatian Interior" ("Hrvatski interijeri d.o.o."), Wood cluster of Vukovar-Srijem County, Wood cluster of Virovitica-Podravina County (VIRIDIS). Additionally, in January 2013 the Croatian competitiveness cluster of the wood- processing sector was founded. Kersan-Škabić (2011) conducted a survey about the activities of

wood clusters that existed at that time, as well as the effects of these clusters on their members. Results of the research indicated that although there were several clusters in the wood industry of the Republic of Croatia, only the Wood Cluster of Northwestern Croatia had largely fulfilled the expectations of the members. There were obvious results in the fact that new companies were established, joint activities were conducted and the cluster performed in export markets. It is important to mention that clusters are fragmented because of regional identity, and that all analysed clusters have a small number of members and their financial efficiency is questionable. On the other hand, it is positive that the need to link small businesses and crafts is recognized as well as the possibility that the existing clusters form a network of wood clusters, which would create better conditions for the production of sophisticated and high-value products that have a significant share in Croatian exports. At the same time, Croatia would have a comparative advantage in their production.

3. CLUSTERS IN WOOD AND WOOD-BASED INDUSTRIES IN THE EUROPEAN UNION

The future development of Croatian wood industry should be more oriented toward clusters and their benefits. As the above analysis has shown, the wood sector is highly developed in EU countries and Croatian producers have to work on technological development and high level of manufacturing of wood products.

Cluster policy in the EU is carried out at the EU level, national and regional level (Dragičević and Obadić, 2013). The cluster concept is very accepted in the field of wood and wood-based industries and Table 3 in Appendix presents clusters in EU-27. According to Cluster Observatory Data there are 54 cluster organizations (among them there are two science parks, one regional agency, and one university transfer office) in EU-27. Most of them are located in Italy in the field of production of furniture.

More qualitative analysis of cluster importance can be made through star assessment. The European Cluster Observatory shows the extent to which clusters have achieved this specialized critical mass by measuring three factors: size star, specialization star and focus star), and assigning each cluster 0, 1, 2 or 3 Stars depending on how many of the below criteria are met.[6]

[6] Size Star: if employment reaches a sufficient share of total European employment, it is more likely that meaningful economic effects of clusters will be present. The size measure shows whether a cluster is in the top 10% of all clusters in Europe within the same cluster category in terms of the number of employees.
Specialisation Star: if a region is more specialized in a specific cluster category than the overall economy across all regions, this is likely to be an indication that the economic effects of the regional cluster have been strong enough to attract related economic activity from other regions to this location, and that spillovers and linkages will be stronger. The specialisation measure compares the proportion of employment in a cluster category in a region over the total employment in the same region, to the proportion of total European employment in that cluster category over total European employment. The measure needs to be at least 2 to receive a star.
Focus Star: if a cluster accounts for a larger share of a region's overall employment, it is more likely that spill -over effects and linkages will actually occur instead of being drowned in the economic interaction of

Table 4: Number of clusters with three, two or one stars in EU-27 wood and furniture industry in 2011

Countries	3 stars	2 stars	1 star	Number of employees
Bulgaria	0	0	1	8283
Austria	0	0	5	25111
Belgium	0	0	1	5288
Czech Republic	0	1	0	9076
Denmark	0	0	1	9080
Estonia	0	0	1	8829
Finland	0	0	1	2824
Germany	0	1	1	17154
Hungary	0	0	1	5785
Italy	1	3	3	122743
Latvia	0	0	1	10713
Lithuania	0	1	0	21563
Malta	0	0	1	2256
Poland	1	3	8	95420
Romania	1	3	1	90726
Slovakia	0	0	2	12364
Slovenia	0	1	0	9738
Spain	0	0	2	18365
Sweden	0	0	1	3952

Source: European Cluster Observatory, http://www.clusterobservatory.eu

According to Table 4, it is evident that the largest number of clusters in the EU has one star which describes their importance in the share of employment and specialization of specific regions in EU member states. Only three countries: Italy, Poland and Romania have clusters at the level of three stars which shows that wood and/or furniture industry in very important in some of their regions. Italy also has the biggest number of employees in that sector. Table 5 gives more details about clusters in wood and furniture industry in Italy.

other parts of the regional economy. The focus measure shows the extent to which the regional economy is focused upon the industries comprising the cluster category and relates employment in the cluster to total employment in the region. The top 10% of clusters which account for the largest proportion of their region's total employment receive a star.

Table 5: Clusters in wood and furniture industry in Italy

Name of cluster	N. of enterprises	N. of enterprises less than 49 employees in %	N. of employees (2010)	Export (2011) in million euro
Distretto del mobile della Brianza	3200	98,4	24424	1504
Distretto del mobile classico della pianura veneta	2474	98,9	11006	324
Distretto della sedia	1790	98,6	10191	540
Distretto dell'arredamento e metalmeccanica di Marsciano	…	…	…	…
Metadistretto Veneto della filiera legno-arredo	4523	95,0	43251	2367
Distretto del mobile (The Furniture District)	700	…	12000	…
Distretto del mobile dell'Abruzzo centro-settentrionale	…	…	…	…
Distretto del mobile di Forlì	430	98,0	3345	172
Distretto del mobile di Matera	2400	98,5	11803	424
Distretto del mobile d'arte di Bassano	1640	98,7	9674	347
Distretto del mobile di Pesaro	2031	95,8	16784	664
Distretto del mobile di Poggibonsi	3755	99,4	11376	432
Italian Chair District	…	…	…	…

Source: www.distretti.org, www.italian-chair-district.it, www.distrettodelmobilelivenza.it

Italian clusters exist in the furniture industry and they help build the competitive advantage in that branch. Small and medium sized enterprises are prevalent in Italian clusters (industrial districts). All clusters include a very large number of companies (between 430 in Distretto del mobile di Matera and 3755 in Distretto del mobile di Poggibonsi). Some of the clusters specialize in production of particular furniture: chairs or classic furniture (Distretto della sedia and Italian Chair District, Metadistretto Veneto del legno-arredo), upholstered furniture (Distretto del mobile di Forli, Distretto industriale del mobile imbottito di Matera), hotel furniture (Distretto del mobile di Forli), kitchen furniture (Distretto industriale del legno e mobili di Poggibonsi-Sinalunga), etc. It is also necessary to bring attention to the cluster in the north of Italy: Distretto del mobile Livenza (Furniture District) which is located in the regions of Friuli Venezia Giulia and Veneto where wood industry enterprises employ about 35% of total employed persons in the manufacturing industry. This cluster is located close to Croatia and Croatian clusters and wood industry enterprises could find a way to cooperate with and network with it.

There is also a cluster association (La Federazione dei Distretti Italiani) that incorporates all clusters in the manufacturing industry.[7] The main purpose of the Federation is to enable dialogue between business networks and supply chains in various districts using procedures laid down by region. The objective is to foster relations with

[7] Today it brings together 50 clusters in the manufacturing industry, 75 000 enterprises; 489 000 employees.

industrial policy makers at both national and Community level, as well as to launch international relations with other districts, economic and cultural organizations, to promote studies and research in the field of economic, financial and technological development, foster connections between institutional traders, economic, cultural and scientific shareholders as well as to raise awareness about the widespread need for policies in order to develop local systems and networks.

Clusters in Italy are a good example of how small enterprises can cooperate and succeed on the market with growing competition from China and other Southeast Asian countries that produce cheaper furniture.

4. CONCLUSION

Success and importance of clusters depends on many factors, such as the identity of the initiator of the establishment, the organizational structure, the motives of members and functioning. The problem is that in developing countries clusters often do not occur "naturally" at the initiative of companies which belong to the same branch of activity, but the state or the local community often impose this idea on local businesses, who do not know what expect from such an association.

Wood industry in the EU and Croatia is facing a decrease in production, trade and employment in the crisis years. Recovery is very slow and inadequate for achieving the desired level of production and employment. Croatia faces a very deep fall in consumption and import, which has caused an increase in the placement of wood products on the domestic market. The solution for Croatian fragmented wood industry should be a more integrated approach and better cooperation among producers.

Croatia has developed a cluster approach and several clusters have been formed in wood industry, but their activities have not proved to be satisfactory for theirs members. Croatian producers in wood industry should be more oriented toward joint activities provided by clusters because their chances of survival (due to their size and production orientation) on the large EU market are very slim. Croatian clusters are very fragmented and small (in numbers of enterprises and numbers of employees). They should seriously consider the possibility of building a Croatian network of wood clusters and this step could foster the connection with the clusters in the EU where the Italian case shows very good experience in connecting a large number of firms and specialising in specific field of furniture production.

Future development of wood and wood-based industries in the EU is guided by the strategy Europe 2020 in which one of the specific objectives is an increased use of renewable energy. Further orientation of Croatian wood and wood-based industry should take this into account and put a greater emphasis on the use of wood in green building, bioenergy and the production of pellets as a renewable energy source, all fields in which the EU recorded the highest growth in the previous period. On the other hand, there is room for increasing furniture production, which has a higher added value especially if we take into account that Croatia is a net importer of furniture.

Although trends on the global market are changing, recovery after the global economic crisis suggests that there is area for the development of wood industry and this is the direction that domestic production and exports should take. This will certainly have implications for the development of rural areas, but also for the manufacturing industry in general.

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APPENDIX

Table 6: Clusters in the furniture and wood industry in the EU-27

Countries	Name	Web address
Furniture		
Austria	Möbel & Holzbau Cluster	www.m-h-c.at
Austria	Clusterland Upper Austria	www.clusterland.at
Austria	Green Building Cluster of Lower Austria	http://www.ecoplus.at
Czech Republic	CCCM The Cluster of Czech Furniture Manufacturers	www.furniturecluster.cz
Czech Republic	Moravskoslezsky energeticky klastr	www.msek.cz
Denmark	Danish Innovation Centre for Furniture and Woodvorking Industry	www.moebelcenter.dk
Germany	Cluster Forst und Holz Bayern gGmbH	www.cluster-forstholzbayern.de
Germany	Wald-Zentrum	www.wald-zentrum.de
Hungary	Magyar Bútoripari Klaszter Hungarian Furniture Industry Cluster	www.mabuk.hu/index.htm
Hungary	Pannon Wood and Furniture	www.panfa.hu
Italy	Centro Studi sull'Impresa e sul Patrimonio Industriale	www.studimpresa.vi.it
Italy	Distretto del mobile della Brianza	www.distretti.org
Italy	Distretto del mobile classico della pianura veneta	www.distretti.org
Italy	Distretto della sedia	www.distretti.org
Italy	Distretto dell'arredamento e metalmeccanica di Marsciano	www.distretti.org
Italy	Metadistretto Veneto della filiera legno-arredo	www.distretti.org
Italy	Distretto del mobile Livenza The Furniture District	www.distrettodelmobilelivenza.it
Italy	Distretto del mobile dell'Abruzzo centro-settentrionale	www.distretti.org
Italy	Distretto del mobile di Forlì	www.distretti.org
Italy	Distretto del mobile di Matera	www.distretti.org
Italy	Distretto del mobile d'arte di Bassano	www.distretti.org
Italy	Distretto del mobile di Pesaro	www.distretti.org
Italy	Service Center for furniture wood	www.clacsrl.it
Italy	Distretto del mobile di Poggibonsi	http://www.csm.toscana.it
Italy	Italian Chair District	www.italian-chair-district.it
Lithuania	Lithuanian furniture cluster	www.furniturecluster.lt
Romania	City Hall Sighetu Marmatiei	www.primaria-sighet.ro
Romania	Transylvanian Furniture Cluster	http://www.transylvanianfurniture.com
Slovenia	Slovenian Wood Industry Cluster	grozd.sloles.com
Spain	Agrupació Moble Innovador de Catalunya (AMIC)	www.amicmoble.org
Spain	CEMER	www.cemer.es
Spain	Clúster Sociosanitario de Extremadura	www.clustersalud.es
Spain	Universidad Politecnica Valencia	www.upv.es
Sweden	Möbelriket Furniture Kingdom	www.mobelriket.se
Forest products		
Germany	Wald-Zentrum	www.wald-zentrum.de

Portugal	aiff Associação para a Competitividade das Indústrias da Fileira Florestal	http://www.aiff.org.pt/
Sweden	The Paper Province	www.paperprovince.com
Forestry		
Austria	Holzcluster Steiermark	www.holzcluster-steiermark.at
Austria	Holzcluster Salzburg	www.holzcluster.at
Austria	TecNet Holz-Cluster	www.holzcluster-noe.at
Czech Republic	Moravskoslezsky energeticky klastr	www.msek.cz
Estonia	Tartu Science Park	www.teaduspark.ee
Estonia	Wood building cluster of Estonia	www.estoniantimber.ee
Finland	Lappeenranta Innovation	www.lprinno.fi
Finland	North Karelia Centre of Expertise	www.carelian.fi
France	Industries et Pin maritime du futur	www.ipmf.fr
Germany	Cluster Forst und Holz Bayern gGmbH	www.cluster-forstholzbayern.de
Germany	Wald-Zentrum	www.wald-zentrum.de
Poland	Śląski Klaster Drzewny	www.igsilesia.pl
Portugal	aiff Associação para a Competitividade das Indústrias da Fileira Florestal	http://www.aiff.org.pt/
Slovakia	Narodne Lesnicke Centrum National forestry centre	www.nlcsk.sk
Spain	FEIM- Spanish Federation of Wood Industries	www.feim.org
Sweden	DalaBIT	www.dalabit.se
United Kingdom	Scottish Forest Industries Cluster	www.forestryscotland.com

The Observatory's definition of Furniture includes the following NACE 2.0 industries: 16.21 Manufacture of veneer sheets and wood-based panels; 16.22 Manufacture of assembled parquet floors; 23.49 Manufacture of other ceramic products; 31.09 Manufacture of other furniture.

Source: Cluster observatory, http://www.clusterobservatory.eu/

HRVATSKA DRVNA INDUSTRIJA – KLASTERI, KONKURENTNOST I PERSPEKTIVE RAZVOJA U OKVIRU ČLANSTVA U EUROPSKOJ UNIJI[8]

Ines Kersan-Škabić [9]

Sažetak

Cilj rada je utvrditi mogućnosti razvoja hrvatske drvne industrije i klastera u drvnoj industriji nakon ulaska Hrvatske u Europsku uniju. Analizirana je i komparirana situacija u drvnoj industriji Europske unije i Hrvatske: značaj i obilježja drvne industrije i klasterizacije u drvnoj industriji. Rezultati pokazuju da u drvnoj industriji EU-a postoje brojni klasteri koji se najčešće pojavljuju u talijanskom gospodarstvu koje je prepoznatljivo (poznato) po proizvodnji namještaja. Klasteri u EU su velike organizacije s puno poduzeća i istaknutom specijalizacijom, dok u Hrvatskoj klasteri uključuju mali broj poduzeća. Iz provedene analize proizlaze sljedeće preporuke za porast konkurentnosti: stvaranje mreže klastera u Hrvatskoj i povezivanje sa sličnim klasterima iz EU; usmjeravanje prema proizvodnji namještaja s visokom dodanom vrijednošću i prema većoj upotrebi drva kao obnovljivog izvora energije (proizvodnja peleta).

Ključne riječi: *drvo i drvna industrija, EU, Hrvatska, klasteri, konkurentnost.*

JEL klasifikacija: *L68, L70*

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