

# APPLYING TRIPLE HELIX CONCEPT TO DEVELOP WOOD SECTOR IN VUKOVAR-SRIJEM COUNTY

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## **Abstract**

*Wood sector is important development sector in Vukovar-Srijem County. Existing resources of high quality raw wood material, tradition of wood processing and good geographic location have potential for attracting investment, raising competitiveness and increasing employment. This paper accentuates the necessity of establishing strong collaboration between public, private and academic sector in order to develop new technologies and new products with high added value. After brief analysis of wood sector on national and regional level, basic indices for establishing Triple Helix institution are given.*

**Keywords:** *Triple Helix, regional development, wood sector, Vukovar-Srijem County*

**JEL Classification:** L6, L68, L73

## INTRODUCTION

Wood industry is an important segment of Croatian economy, which has proven comparative advantages: high potential of domestic raw materials, potential locations and relatively low investment in individual business processes and programs. All that can be targeted and used for acquisition of competitive skills necessary for sustainability in the market, which is characterized by growing competition and high requirements for suppliers of goods and services.

Croatian wood processing sector has a long tradition too. The first water-powered sawmill was founded in 1428 and the first furniture factory in 1884. The most known products were oak planks from Slavonian sawmills, which was the most attractive product on the market (Motik; 2013, 3). Forests and forest land makes 48% of Croatian territory, which is around 2,5 mil ha. Wood industry and forestry generate 3% of Croatian GDP (Kavran; 2014, 95). Furthermore, global demand for wood and wood products is expected to rise 3% per year (Radoš; 2014, 163). Evidently, wood industry in Croatia has growth potential, but for competitiveness on world's level, new technologies and new products with high added value are needed.

Vukovar-Srijem County is the eastern most Croatian county, covering an area of 2448 km<sup>2</sup>, accounting for 2,8% of Croatian territory (VSŽ; 2011, 16). Although it has an excellent geographical position and great potential in natural resources (i.e., unique oak forests), Vukovar-Srijem County is one of the least developed counties in Croatia (Singer et al.; 2014, 23).

Entirely forest areas (including famous Spačva basin with well known Slavonian oak) cover 69.383 ha, which makes 28,7% of the county area. At this area, the total wood stock is approx. 19 mil m<sup>3</sup> with average wood stock 344.000 m<sup>3</sup> of gross wood mass, managed by „Hrvatske šume“, Administration Vinkovci (VSŽ; 2014, 2). These are solid foundations for further development of wood industry towards final wood products, including furniture.

**Table 1.** Comparison of primary and secondary wood products and furniture import and export

	Production (mil. euro)	Import (mil. euro)	Export (mil. euro)
Primary and secondary wood products	624,2	147,4	537,5
Furniture	437,8	224,1	281,0

Source: Motik, 2014, 4.

Besides high export of primary and secondary wood products comparing to export of furniture shown in Table 1., many weaknesses were identified in studies and analysis of Vukovar-Srijem County wood-processing sector. Combined with strenghts, opportunities and threats they are showed in SWOT analysis in Table 2.

**Table 2.** SWOT analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Available high quality basic raw materials</li> <li>• Favourable geographic location</li> <li>• Long industry tradition</li> <li>• Possession of FSC certificate</li> </ul>	<ul style="list-style-type: none"> <li>• Export of high quality raw material</li> <li>• Old technology</li> <li>• Manufacturing of products with low added value</li> <li>• Poor work productivity and high cost of manufacturing</li> <li>• Low share of research, development and innovations in SME's</li> <li>• Underdeveloped infrastructure for technology transfer and commercialization of innovation</li> <li>• Poor market positioning</li> <li>• Inadequate investment in sector promotion</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Trend of usage of wood as ecological and renewable raw material</li> <li>• Higher demand for eco products at the developed global markets</li> <li>• Possibility to use EU funds</li> <li>• Decrease of production costs through using the renewable energy resources (bio mass) and effective energy management</li> <li>• Gaining skills and life-long education</li> <li>• Utilisation of KET technologies</li> <li>• Development of products in accordance with customers' needs, providing designing and furnishing services</li> <li>• Investing into the development and design implementation in order to develop brand of wood industry</li> </ul>	<ul style="list-style-type: none"> <li>• Globalisation of the world market</li> <li>• Global financial crisis</li> <li>• Price competition of low quality products from Asia</li> <li>• 'Grey' market in manufacturing furniture</li> <li>• Rise of the energy cost at the global market</li> </ul>

Source: Authors analysis.

Significant influence on resolving outnumbered weaknesses is expected from research, development and innovation projects, which should be prepared and implemented by Triple Helix institution. In resolving these weaknesses, Triple Helix institution should use and target:

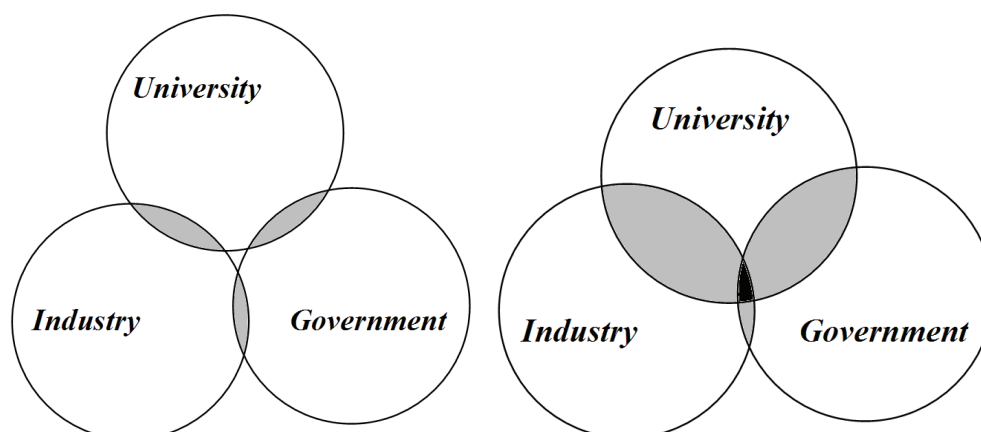
- industry: small and medium enterprises from wood sector and large companies with development potential,
- university: education, scientific and research institutions,
- government: regional and local government units.

## COMPETENCE CENTRE AND TRIPLE HELIX CONCEPT

Competence Centres are legal entities that conduct research projects for development or production and develop competencies in certain areas. Furthermore, competence centers are focused on development and applied research and its commercialization, as well as supporting and strengthening intellectual property rights in specific subject areas and branches of competence (Fleischhaker et al.; 2008, 8).

In last 20 years Triple Helix developed into a widely accepted conceptual framework which brings together knowledge, consensus and innovations of three (or four) major social actors: university - government - industry (and civil society) (Etzkowitz & Leydesdorff; 2000, 3). Therefore, Competence centre is positive example of Triple Helix concept application, showed in Figure 1. which emphasizes importance of communication and collaboration of all three entities involved: university, industry and government - not just two of them.

**Figure 1.** Negative and positive application of Triple Helix concept



Source: Lawton Smith & Leydesdorff; 2012, 3.

Competence Centres have recently been recognized as an important instrument for resolving the so-called European paradox - European Union, as one of the leaders in the R&I with proven quality of human resources, can't succeed in converting innovations in market value.

### UNIVERSITY-INDUSTRY-GOVERNMENT

Faculty of Forestry, University of Zagreb and Croatian Forest Research Institute have knowledge and research capacities that are not used in wood industry as they should be. One of the Competence centres demanding task will be to link wood industry with these research and innovation capacities in order to fulfil its goals. Faculty of Forestry is strengthening and developing part of the formal education related to technical and technological wood processing topics (Šumarski fakultet; 2015). Croatian Forest Research Institute's principle objectives are conservation and preservation of stability, productivity, biodiversity and genetic resources of forest ecosystems, using natural rejuvenation and the achieved level of sustainable forest management (Hrvatski šumarski institut; 2015).

Wood industry of Vukovar-Srijem County consists of wood processing companies, mostly small and medium-sized enterprises, gathered in Vukovar-Srijem County Wood Cluster. It is an association registered with the State Administration Office in Vukovar-Srijem County as a nonprofit legal entity. The association was founded with the aim of promotion, development and

improvement of wood industry in Vukovar-Srijem County and its mission is to create new jobs and business opportunities in the region by fostering entrepreneurship in wood industry and facilitating SME's internationalisation activities. There are 25 members, including supporting institutions: Vukovar-Srijem County, VSC Development Agency Hrast Ltd. and Wood Technical Secondary School Vinkovci. VSC WC acts in close partnership with local and regional government, national cluster organisations (Croatian Wood Cluster), other SME intermediaries, service providers, research and knowledge institutes. Wood Cluster of VSC is a member of Croatian competitiveness cluster of wood-processing sector, within Ministry of Economy, Agency for Investments and Competitiveness. (Vukovar-Srijem County Wood Cluster; 2015)

Vukovar-Srijem County as a regional government unit, together with its institutions and agencies, cities and municipalities will form strong base of Triple Helix alliance.

## COMPETENCE CENTRE FOR SLAVONIAN OAK

The main idea of establishing Competence Centre for Slavonian oak is to provide a platform for the research and development in wood sector and to encourage constantly developing competencies in this field. As Triple Helix concept is based on cooperation between public, scientific and private sectors, so should Competence Centre conduct scientific research and encourage their commercialization in order to enhance competitiveness of business sector (Fleischhacker et al.; 2008, 6).

General aim of the Competence Centre for Slavonian oak is set on: Starting the positive trends in the timber industry and establishing technology platform that will serve as a development support for wood-processing industry whose main activities are based on the processing and using oak tree.

Competence Centre should:

- encourage cooperation between scientific community and entrepreneurs, and promote development and applied research, to improve the level of innovation and commercialization and intellectual property protection,
- create a foundation for continuous transfer of technology and knowledge, necessary for an active competition and strengthen the competitiveness of the entities involved,

- provide entrepreneurs with advanced business support services in order to improve the level of added value of their products,
- offer an answer to the previously identified problems especially in the area of product development, improvement of production processes, application of standards, development of human and organizational capital, building brand and market position as well as application of new technological solutions.

In order to function and to be able to offer services, Competence Centre should ensure a strong and stable base of scientists to launch research and also build relationships and trust with entrepreneurs to test and apply the research results. Aggravating circumstance is absence of university centre in the narrower and wider area of Centre. This will be resolved by cooperation with Faculty of Forestry from Zagreb University and Croatian Forest Research Institute from Jastrebarsko – two most significant scientific and research institutions in forestry and wood technology sector in Croatia. Since the operation of the Competence Centre directly depend on public funding, significant support will come from Vukovar-Srijem County, Republic of Croatia and European Union.

Research and development are the starting points for future Competence Centre. In order to formal organization become a Centre of Competence it is necessary to ensure the preconditions for research and transfer of research results to companies within the wood sector.

Important result of operational functioning of Competence Centre will be establishment of spin-offs. Therefore, the Competence Centre in collaboration with Vukovar-Srijem County Development Agency and Technology Park, will be a support institution for startup companies that are planning to set up in wood sector. With these activities, Competence Centre will be connected to a common idea for strengthening the competitiveness of the wood sector entities. Therefore, special attention should be on creating content of Competence Centre for the application of alternative and smart materials, new technological solutions in production processes and product design, adopting advanced production technology and supporting innovations at all levels. Using new ICT technologies should increase efficiency in the consumption of raw material, improving communication throughout the production chain from primary products to the end customer and provide adequate monitoring system for forest management and logistics. Significant impact could have application of nanotechnology, too.



## CONCLUSION

Wood sector in Vukovar-Srijem County has proven comparative advantages and therefore biggest potential to boost development of the region - in accordance with smart specialisation strategy.

To do that, wood sector as private sector, needs to overcome existing weaknesses, by applying Triple Helix concept and meeting universities and government - establishing a Competence Centre for Slavonian Oak. Research, development and innovation projects of Competence Centre should result in new technologies and new products with high added value – crucial for the development of wood sector and the region itself.

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