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HARDWOOD TRADE IN SELECTED COUNTRIES OF EASTERN EUROPE

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ABSTRACT

This study focuses on trade of hardwood products in selected countries of Eastern Europe, specifically the Czech Republic, Slovakia, and Hungary. It was supported by a survey conducted with companies producing products made of hardwoods. It monitors trade trends in the wood products industry, specifically focusing on lumber, wooden veneers, furniture production, musical instruments, and wooden accessories. It also addresses the current and potential import and use of the US hardwood lumber in these countries. The study is also pointing out the shortcomings of the monitored markets. The online questionnaire and follow-up phone calls were used to obtain information from companies in countries of interest. Results showed that 83.3% of Czech respondents already use imported hardwoods in their production, followed by Hungary (69.2%) and Slovakia (54.6%). Despite the relatively high values of imported hardwood products, the overall results show that there is only a small potential for an increase in import of the US hardwoods in the wood products industry in chosen countries. The utilization of tropical hardwood species will continue because of their superior properties for specialized products such as musical instruments. Results also point out the grooving importance of certified hardwoods, their utilization, and trade.

KEYWORDS: Hardwood trade, hardwood products, US hardwoods, Eastern Europe.

INTRODUCTION

Over the last two decades, ongoing economic globalization has brought considerable changes in how wood products companies use and trade the material for their production. This study aimed to better understand the supply and trade of hardwood resources, such as lumber veneer, and finished products, such as furniture, in the selected countries of Eastern Europe, with the vision to facilitate potential opportunities for better international cooperation. Despite the pronounced downturn in many hardwood markets during this time, some evidence suggests that the smaller, customized manufacturing sector has fared better than the more traditional mass producers (Bumgardner et al. 2007, Buehlmann et al. 2008, Lihra et al. 2008). These smaller, customer-oriented manufacturers offer customized services and products and serve niche markets (Anderson 2006). However, their aggregate material consumption increases the importance of hardwood lumber producers (Luppold and Bumgardner 2008). This situation is very similar in Eastern European countries where the wood products industry plays a vital role and is represented mainly by smaller customized manufacturers. These producers need a steady supply of material to produce high-quality products, which they sell locally and globally. It is believed that adequate material supply should be available from local resources since Eastern European countries are highly forested. For numerous reasons, some producers are experiencing a shortage in the material supply of their choice and seeking imported resources. Hardwood lumber consumption and trade are difficult to measure. Estimates of consumption for individual industries exist based on survey data (Forbes et al. 1993), but these estimates are only snapshots and are not current. It is also essential to understand that the international hardwood lumber market seen can change quickly. The market that existed in the 1990s is not the same market the wood products industry faces today (Grzegorzewska and Sedliacikova 2021 Grzegorzewska et al. 2020). The systemic transformation that followed the collapse of communist regimes in the early 1990s in European countries of the so-called Eastern Bloc affected all areas of the economy, including forestry and forest products (Zālītis 2015). Nevertheless, forest-based sectors in these regions continue to contribute significantly to the quality of life and sustainable natural resource utilization. For example, given the current state of the forestry and forest-based sectors in Slovakia, innovation trends in these sectors are oriented toward efficient wood processing, technological innovations, new software solutions, better services, and other approaches (Orazio et al. 2017, Hajduchova et al. 2016). The wood trade manners and market decisions on the Slovakian market were also researched and presented (Halaj et al., 2018). Due to the growing global demand for wood and wood products, it is crucial to be competitive in the international market to use the potential gains of this increased demand. The raw material path is relatively long, as wood is processed into the final products and delivered to a consumer. It passes several production stages and different markets until the final product fulfills the consumers' needs (Parobek et al. 2014). In environmentally sensitive markets, forest products' competitiveness can be influenced by factors related to the origin of wood material from sustainable and renewable sources (Paluš and Kaputa 2009).

Trade is usually associated with large economies, but also for small and vulnerable economies, exports and imports are essential in sustaining growth and external viability. Their long-term survival is dependent on their ability to compete with exports of similar products

from other countries on the international market. It is also known that a nation engaging in trade gains has a comparative advantage not because it can produce goods or services cheaper but because it is relatively more efficient than other nations in producing these goods or services (Carvalho et al., 2009). The importance of globalization in the development of world markets has been evident in recent decades, and its impact can be observed as well on the wood products market. Several studies reflect the global changes in industrial wood and wood products markets (Hurmekoski 2013, Buongiorno 2015, Zhang 2012, Dragicevic 2017, Knauf 2017, Latta et al. 2016, Wear et al., 2016). Economic growth represents one of the most important factors, which creates ideal conditions for timber market development. Following the theory of derived demand, the demand for wood depends on the demand for final wood products (Parobek et al. 2014).

The set of economic and political decisions have also impacted the whole wood market sector. The EU industrial wood and wood products trade is nearly 50% of the global trade. Therefore, the EU represents one of the world's most robust trading blocks. There was a significant shift in wood flows in Eastern Europe, namely in the Czech Republic. The exported volume of roundwood from the Czech Republic increased by almost 43% between 2015 and 2017, and it was the largest export of raw roundwood among all EU members. The share of the EU's import of roundwood worldwide has been stable over the past five years and reached about 40%. The share of exports was about 30% (Dzian et al. 2019).

The overall scope of this study is to find out more about how forest products companies in Eastern Europe source the material for their production and if there is an interest to expand their trade of hardwood resources (import or export) to other markers. The online survey was used as the primary tool to collect information from targeted companies to determine if they are producing their products from domestic or imported wood products, their raw material preferences, trends in management, and marketing practices.

MATERIALS AND METHODS

Steps of survey creation and data collection

The surveying process was preceded by secondary research, which aimed to target companies involved in producing hardwood products in selected countries of the Czech Republic, Slovakia, and Hungary. The database included companies producing and displaying on their website products made of hardwoods such as veneers, musical instruments, or hardwood accessories. The created database of companies included only publicly available information, company name, contact person and their job title, company headquarters, date of company establishment, number of employees, and turnover, if available. The industry experts and industry association representatives in all targeted countries reviewed the created hardwood products company database. This step was followed by developing an online questionnaire. The initial e-mail was sent to selected companies to acquaint them with the research scope and obtain permission to send them additional e-mails with the actual web-based questionnaire. Altogether, 80 companies were approached to participate in this survey, representatives from the secondary and the tertiary wood products sector, which are companies producing and trading targeted hardwood products. Surveying took place in the official

languages of each addressed country. Two e-mails with a link to the online questionnaire were mailed to companies, with a one-week separation between mailings. The response rate after the first e-mail was low at 13%. A week later, the second e-mail was sent immediately after a telephone call reminder, reaching out to the previously contacted company representatives. This approach was very successful and yielded a high response rate (on average, 45%). Some company representatives were friendly and agreed to participate in an extended phone interview, discussing the given topic further. This information was collated and reported in the result section.

Questionnaire structure

In a qualitative study, as in research methods in general, rigorous data collection procedures are the main factors that influence quality and trustworthiness (Kitto et al. 2008) and critically influence the study results (Gibbs et al. 2007). Eastern European wood product manufacturers producing or having the potential to produce their products from hardwoods imported from other markets (including popular tropical wood species) were examined by voluntary questionnaire. A systematic literature review was carried out (Campbell et al. 2014), exploring empirical and theoretical scientific papers or research reports that focused on developing semi-structured interview guidelines. In the end, the final version of the questionnaire containing 18 questions was developed.

All collected information was identified, grouped, labeled, and sorted into sub-categories based on their similarities and differences. After these steps, sub-categories were further grouped and allocated to the main studied categories, covering various methodology phases (Elo and Kyngäs 2008).

RESULTS AND DISCUSSION

Firm characteristics

In total, 25 Czech (CZ), 25 Slovak (SR), and 30 Hungarian (HU) companies participated in the survey. The response rate in the Czech Republic was 48%, in Slovakia 44%, and in Hungary 43.3%. The overall response rate of the questionnaires was 45%. There were 36 valid questionnaires and one incomplete and therefore excluded this questionnaire. Almost half of the responses came from the production sector of manufacturing furniture, interior products, and parquet flooring (47.2%). Other respondents were producers of veneers (11.1%), musical instruments (13.8%), and lumber producers (13.8%). A small range of addressed companies was also involved in the production of wooden accessories (8.3%) and shipbuilding (5.5%). Regarding the geographic location, the highest concentration of respondents from the Czech Republic (75%) was located in the eastern part of the country. In Slovakia, almost half of the responding companies came from the western half of the country and the other half from central Slovakia. In Hungary, the responding companies are located in the country's center, close to the country capital. Companies were divided by size into micro enterprises, small enterprises, medium enterprises, and large enterprises, following the EU regulations. The most suitable criteria for determining the enterprise's size were the number of employees (EU regulation) or the company's annual turnover. Company size was defined base on the number of employees.

The results showed that companies' ratio, with the variable number of employees in the Czech Republic and Hungary, is better represented than in Slovakia. While focusing on products from solid wood or veneer, small and medium-sized businesses are dominant in all three targeted countries. Thirty respondents were classified as micro-enterprises, with up to 9 employees. With the increasing number of employees, the number of businesses was decreasing. However, large enterprises of 100 to 500 employees were also found in the Czech Republic and Hungary. It could be concluded from collected responses that the addressed companies engaged in the production of secondary wood products, such as furniture, wood accessories, parquet, or musical instruments, were of a small or medium size. On the other hand, primary wood products companies, those processing logs, veneers, or other semi-products, usually have a higher number of employees (one Hungarian company had over 500). Employees' annual turnover can be a very delicate subject, even though this is one of the criteria that every enterprise must disclose through its financial statements. In addition to specific turnover intervals, there was an option not to answer this question, but it was answered by 16.7% of respondents. However, 50% of respondents reported an annual turnover below 2 million €. Another 33.3% reported the annual turnover in the range from 5 to 10 million €. The rest of the companies selected a turnover above 10 million €.

Import of foreign hardwood species

A significant number of respondents (69%) reported that they import foreign wood species. The lowest balance was reported in Slovakia (54.4%), while the highest in the Czech Republic (83.3%) and Hungary (69.2%). The question about foreign hardwood species' utilization included temperate hardwoods and other tropical hardwood species, mainly those coming from Africa and Asia. The most popular wood species were American black walnut (60%) and mahogany (44%). Regarding the US hardwoods, 70% of Czech and 83.3% of Slovak respondents reported working their experience mostly with American black walnut.

In comparison, 44.4% of Hungarian respondents used Hard maple, as is shown in Fig. 1. It is also important to note that some Czech and Hungarian companies also import a low quantity of local hardwood species. Specifically, species such as European beech or Pin oak.

One of the objectives was to learn about US hardwood species and their proportional representation in production by selected countries. Thus, from a total of 36 respondents, 69.4% reported experience of working with US hardwood species. Fifteen firms (60%) reported using the American black walnut (*Juglans nigra*), followed by Hard maple (*Acer saccharum*), which was identified by eight respondents (32%). In contrast, seven respondents (28%) reported using the Northern white/red oak (*Quercus Alba/ Quercus nigra*). However, American black cherry (*Prunus serotina Ehrhart*) and hickory (*Carya ovata*) were reported as the least used wood species. American black cherry was selected by four companies (16%) and hickory only by two companies (8%). Importing foreign wood species was attributed to their exceptional appearance and superior properties, reported by 48% of companies. Responses showed that 40% of the surveyed companies import foreign wood species for strategic (marketing) reasons, mainly the interest of their customers. However, specific results differ in each country and almost in every company. The most frequent reason was the customer demand, selected by 36% of respondents. Three Czech companies producing wood accessories, musical

instruments, and veneers chose foreign species for their superior structure/texture compared to the domestic hardwood species. One company mentioned that they import wood species from abroad precisely because of better acoustic/resonance properties.

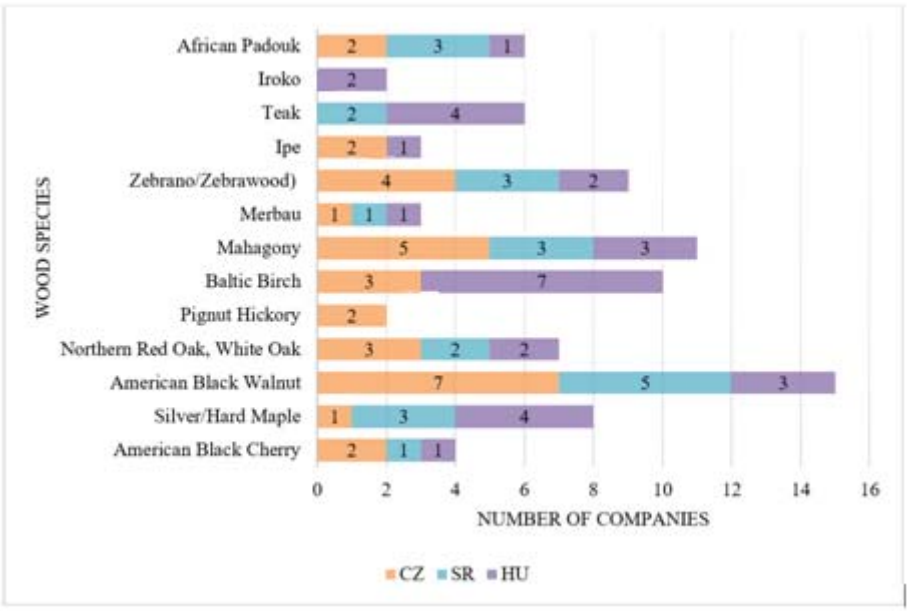

Fig. 1: Imported wood species from abroad by EU countries (CZ, SR, HU).

Production characteristics

Respondents were also asked to comment on their production and the type of imported hardwoods. 65.2% of respondents import wood in the form of lumber, and 56.5% of surveyed companies import and used hardwood veneers. In respect of hardwood logs import, the semi-finished products category was selected only by 17.4% of respondents. It should also be noted that out of 25 companies, just about 8%, only trade and do not process the imported commodities. To evaluate the import of the US hardwoods, it was necessary to exclude companies that import tropical wood species from other continents. The remaining results are not 100% decisive, as most companies import in addition to the US hardwood species also other tropical wood species. For example, if a company reported working with American black walnut and mahogany, they reported a product type importing solid wood and veneer. We wouldn't know which wood species were imported for what type of products. The results showed that the most imported product type of the US hardwood species is lumber, reported by 61.1% of companies from a total of 18 companies. Furthermore, a significant imported product type was the US hardwood veneers (55.6%). The last negligible type of products is semi-finished products (16.6%) and furniture (5.5%).

The following question was related to the perception of better physical and mechanical properties of foreign wood species, mainly concerning musical instrument manufacturers. Thus, the responses received were quite surprising; even though none of the Hungarian companies works in the production of musical instruments, many responded that foreign wood species have better physical and mechanical properties than those of domestic wood species. These respondents work mainly with tropical wood species, such as mahogany, teak, wenge, or iroko, so this statement belongs to those species. The only company from the furniture

manufacturing sector that works with Hard maple reported better physical and mechanical properties than domestic wood species. Altogether, 40% of the surveyed companies said the physical and mechanical properties of foreign wood species are better; the remaining 60% do not consider that the US hardwoods have better physical and mechanical properties than the domestic wood species.

Business environment and customers

Regarding the results, up to 64% of 25 respondents were buying foreign wood species through trade party representatives. Direct trade with the manufacturer/producer was reported by 32% of companies, and 4% of respondents chose not to answer this question. More than half of the companies buy foreign wood species through third-party representatives, which bear witness to an underdeveloped international trade. In the case of the US hardwood products supply, a minimum quantity of goods to the buyer may be determined, which must be loaded on the means of transport to ensure meaningful logistics. For this reason, transportation costs are increasing, and thus direct trade for the addressed countries is almost unrealistic. For long-term contracts, the deliveries' sequence can be managed through shipping consents (consensus letters), regulating the balance and continuity of supply concerning the buyer's storage and processing capacities (Paluš 2013). Trade party representatives are located primarily in Western European countries, specifically Germany, England, and France, where the US hardwoods business is already part of the developed wood sector.

Respondents were also asked if they are selling products made of imported wood species internationally. The survey showed that 76% of respondents' trade abroad their products of mentioned wood species. This situation could be because there is a lack of demand for these products on the domestic market, or a higher price of the final product, targeting more affluent customers. This could mean that such a clientele could stagnate in the country where these products are produced. If the company imports foreign timber, then processing it into a product and exports that product to the external market, under ceteris paribus, the company becomes more competitive on domestic and foreign markets. The remaining 24% of the addressed companies do not export their products made of imported wood species, which would mean the exact opposite of the reasons mentioned above. Regarding US hardwoods, the results have the same tendency; 78% of respondents and US hardwood species users stated that their products are also exported abroad. All Hungarian companies export products made of imported material abroad, which can be seen as a lack of demand from Hungarian customers.

The following results are related to sales trends in the woodworking industry, concerning the activities with the imported wood species and commenting on a global perspective. Given the question about performing sales, the results could predict regarding specific industry's area. The results showed that the Czech and Hungarian companies prefer to operate via the B2C (business to customer) model, while Slovak companies also sell via B2B (business to business). 75% of the surveyed companies realized their sales through B2C and 55.6% through B2B. Hungarian companies do not sell online. Online sales were mentioned by five Czech and two Slovak companies. It is also important to note that some companies perform their sales in variable ways. Hungarian companies also stated that they were using another way of selling their products but did not specify the method. In the case of trading and processing the US

hardwood species, the results are changing only slightly, shown in Fig. 2. In the Czech Republic, sales through the B2B model are dominant, but on the other hand, we see the highest number of online sales. Of course, online sales are not performed by companies that process veneers or lumber, as they are bulky semi-finished products and subject to further processing. Thus, companies automatically introduce online sales by producing products such as accessories, furniture, or musical instruments. The B2C model is still dominant in Slovakia and Hungary, so consumers are the target group.

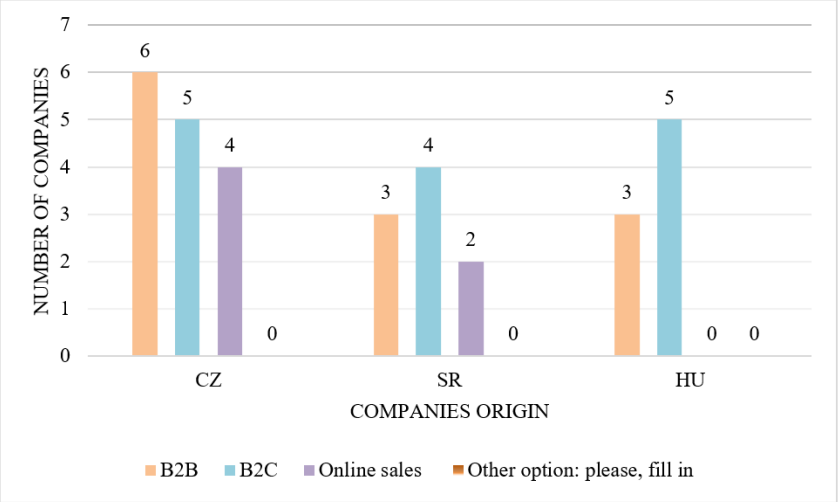

Fig. 2: Sales performance overview based on responses from US hardwood species processing companies.

Sustainable forest management

Forest management and certification play a supportive role in realizing wood production by evaluating social, economic, and ecological objectives. The number of certified forests is increasing rapidly worldwide. The results show that more and more companies prefer wood material of known origin and thus certified wood. Only 27.8% of responding companies from three countries said they did not care about the wood origin. This may result from several limitations on certified raw materials in Eastern EU countries. Final consumers create public opinion, but demand is created at the level of buyers of certified wood. Two certification systems, FSC and PEFC, were used prevalently by the respondents. These two certifications are strongly enforced in the countries of Europe. Some companies claim that they require both PEFC and FSC. Up to 57.7% (Fig. 3) of companies said they required an FSC certification, 15.4% required a PEFC certification, and 23.1% said they needed a different certification. Only one of the companies named CITES certification as an alternative. Focusing on the results obtained from woodworking firms utilizing US resources, the results are as follows. The largest percentage of respondents use the FSC certification, 66.7%. Four companies require PEFC certification, which is 26.7%. The remaining 26.7% use unknown certifications.

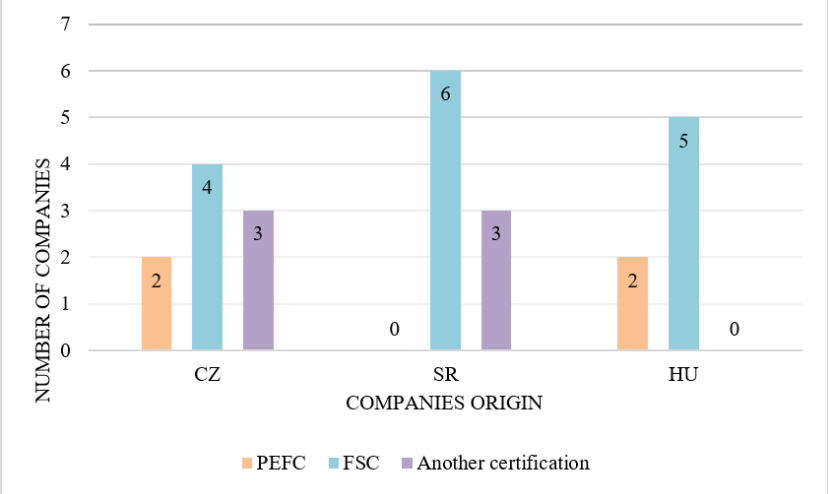

Fig. 3: Wood certification overview responded by addressed companies.

CONCLUSIONS

The main goal of this research was to evaluate the current and potential use of foreign hardwood species in chosen EU countries. Mainly small and medium-size wood processing companies were involved. The survey results showed that there is already ongoing business with well-functioning trade and use of foreign wood species. It showed that 83.33% of Czech respondents already use imported hardwoods in their production, followed by Hungary (69.24%) then Slovakia (54.55%). Compared to the Czech Republic and Hungary, the lower percentage of imported hardwoods users in Slovakia could be attributed to sufficient domestic resources. American walnut is the most popular foreign wood species on the Czech and Slovak markets, and up to 60% of respondents expressed interest in this type of wood species. Hard maple is recognized and valued by Hungarian companies, followed by Black cherry and hickory. The results also showed that 48% of the US hardwoods are imported due to their unique structure and properties that the other wood species cannot replace. 40% of their import is attributed to strategic reasons, such as particular demand from customers. The work aimed to determine if there is a direct business connection between the producer of US hardwood species and the users in Eastern European countries, but this question did not yield very positive results. Up to 77.78% of respondents said that they are importing US hardwoods through sales representatives, which means that import runs through the intermediate links in Western Europe. Because of this, shipping costs are increased. Transport costs will also be increased in direct trade between producer and user if the capacity of transfer is not met. 78% of the surveyed companies said they exported products made of US hardwoods to the external markets. The Hungarian market is focusing mainly on external markets, thus ensuring greater competitiveness. The Czech Republic and Slovakia focus their production mainly on the domestic market. The second outlet of the questionnaire was focused on a potential trade with the foreign wood species. In this survey, 11 respondents were involved, of which only 19% expressed interest in a possible trade with foreign wood species. This interest came from the Hungarian companies, which expressed interest in the US hardwood species such as American walnut, Hard maple, and other African wood species. The vast majority of addressed

companies that do not yet work with foreign wood species and are not very interested came from Slovakia. A similar response was also recorded in the Czech Republic, where companies expressed low interest in foreign wood species.

The application of tropical wood species is still essential in producing musical instruments, such as decorative veneers on the back and side of the guitar. Tropical woods with the highest density (mahogany or wengé) are used for guitar components and so-called bridges. However, the distinctive texture of tropical wood species from afar is not as popular as before, and the current production represents around 2%. The risk of imports is associated with logistics, whether the economic crisis is also one reason for low use.

In terms of sales, it was expected that the bulk of sales would happen through the B2C mechanism, in which the highest emphasis is placed on the targeted customer. This hypothesis was confirmed since the B2C mechanism prevailed in every studied country, where the predominance of small and medium-sized enterprises is most common, and this mechanism most profitable. The growing importance of online sales was observed mainly in the Czech Republic but also in Slovakia when respondents launched online sales. Of course, online sales are challenging for some companies dealing with bulky products. However, with smaller products such as furniture, musical instruments, or wooden accessories, the online sale could be an excellent move and an advantage to combat growing competition.

In recent years, the awareness of sustainable forest management is on a growing trajectory, which is also very strongly reflected in the responses about the importance of the origin of raw material (wood). In the Czech Republic and Slovakia, it is possible to speak unambiguously about the interest in certified wood products, while it is not so clear in Hungary. Their forest areas are so far not prevalently certified. Only in 2016, Hungarian Forest Certification Non-Profit Ltd. became a member of PEFC certification. Currently, no forests in Hungary are certified by PEFC. Nevertheless, the PEFC and FSC chain of custody management is used in Hungary, mainly due to the large export of their products abroad. However, it should be noted that the demand for certified wood and wood products is increasing every year. This statement is based on statistics of ever-growing areas of certified forests and a new chain of custody certificates, especially FSC certification.

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