

**Competitiveness of Forest Products at Global Markets; with Particular
Emphasis on Tropical Forest Products
and on Small and Medium Scale Producers**

Market Review in the U.S. of Selected Timber Products

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Executive Summary

This report provides an overview of the U.S. wood industry and, particularly, the importation of tropical wood products in the U.S. It provides a general overview of relevant secondary wood processing market segments in the U.S. for value-added tropical hardwood products. A general overview of the U.S. wood market is summarized such as major drivers and trends in importing and exporting wood products. Impact of the economic globalization in the forest products industry of the U.S. is included to anticipate future changes and trends. Secondly, a review of the importation of tropical timber products into the U.S. is provided regarding the volumes of tropical wood products imported by market segments, general trends, market share of tropical wood products, and commonly tropical wood species imported into the U.S.

Third, major market segments for imported tropical wood products are analyzed such as outdoor decking, outdoor furniture, flooring, and moulding and millwork. Small and medium-sized enterprises (SME) play an important role for the economy of developed and developing countries. Thus, a brief analysis of SME is provided. Opportunities in the U.S. marketplace for small and medium-sized forestry enterprises (SMFEs) that manufacture tropical timbers were also identified.

The U.S. Forest Products Market

Economic Globalization of Forest Products

Globalization and international competition are impacting the way forest products companies operate. Thanks to globalization, there are new opportunities and challenges for allowing investments, capital, and technologies to move easily into those world regions where production and manufacturing give competitive advantage for a company's operations. Industry changes driven are more apparent in the pulp industry than in the structural wood sector. Today, a forest company might have its headquarters in the United States, build a pulp mill in Central America (where trees grow to commercial maturity in less than a decade), manufacture in China (where the cost of converting pulp into paper is low), and sell to markets all over the world (Alvarez 2007).

Estimates suggest that production of wood products will continue to grow at a rate of 1% per year for the next 10-15 years. Brazil, China and Russia are very likely to be the most important players in international markets by 2020. The fast growth in the trading of wood furniture and other value-added wood products indicates that secondary processing wood products (SPWP) will surpass the currently international trade dominated by pulp and paper. Important strategies to maintain or gain market share internationally include: investments on fast growing plantations, value added products and international market development (FAO 2007). Figure 1 shows the trend of changes in global international trade; whilst the international trade in 1980s was around \$2 trillion, in 2005 it surpassed \$10 trillion.

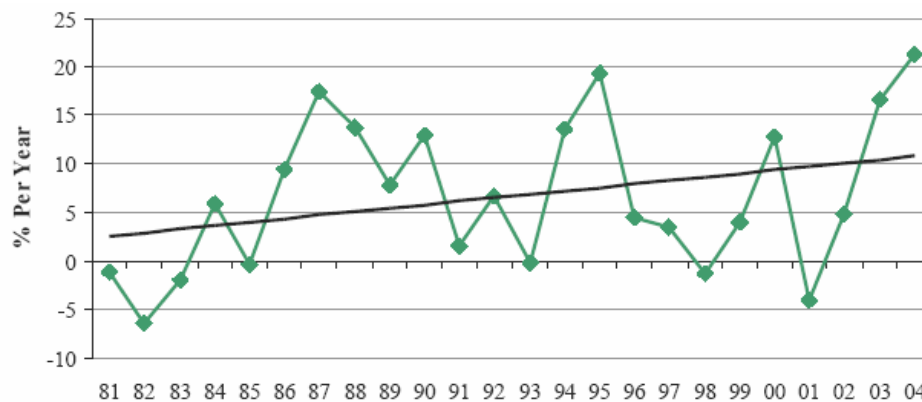


Figure 1. Changes in the Global International Trade (FAO 2007)

Forest plantations will be crucial for the success in the future trade of wood products. It is anticipated that most of the wood supplied to the industry will come from plantations. It is forecasted that total planted area will reach 450 million hectares by 2020, mostly will come from tropical countries and countries from the southern hemisphere. Figure 2 shows this estimation, it is expected that tropical plantations will surpass non-tropical plantations by 2015 (FAO 2007).

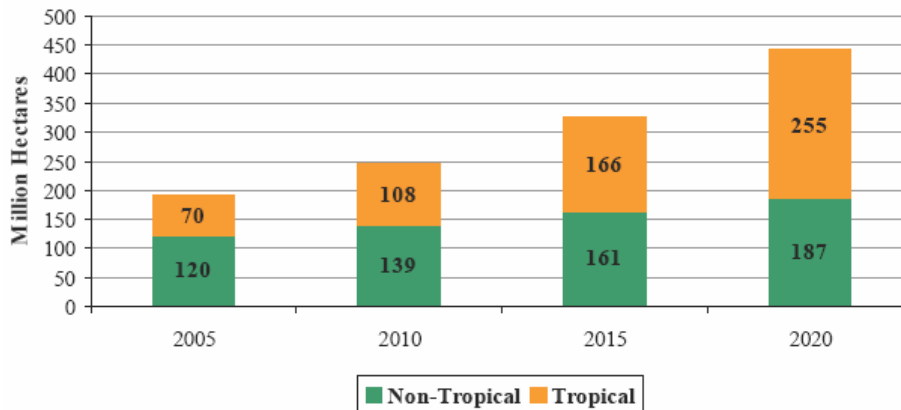


Figure 2. Projected Forest Plantation Areas (FAO 2007)

The US per capita consumption of timber products has remained relatively steady, oscillating between 60 to 83 cubic feet [$1 \text{ m}^3 = 35.314 \text{ cubic foot}$] 1.7 to 2.35 cubic meters per person per year from 1965 through 2005 (Alvarez 2007). The overall employment in the U.S. forest products industry has decreased since 2000. Major changes can be seen in the wood products industry (1.8% between 2005 and 2006), paper and paper products (3.5% between 2005 and 2006), and logging (2.9%) (Alvarez 2007).

U.S. Hardwood Lumber Consumption

Even though the consumption of timber products the U.S. have increased from about 12 billion cubic feet [339 Mm^3] in 1965 to 20 billion cubic feet [566 Mm^3] in 2005 (Alvarez 2007), there exists a decreasing trend in the proportion of consumption versus production of U.S. timber products, i.e. the rise of imports carried out a diminution of production. Overall, US consumption of timber products exceeds US production by 4.2 billion cubic feet [119 M m^3]. Figure 3 shows the trend of consumption and production of timber products in the U.S. between 1965 and 2005 (Alvarez 2007). In this period, the consumption of lumber growth 43%, plywood growth 32%, pulpwood growth 45%, and fuelwood growth 33%. It is estimated that the consumption of timber products in relevant markets in 2005 was: lumber (53%), pulp products (32%), plywood and veneer (7%), fuelwood (7%), and other industries (1%) (Alvarez 2007).

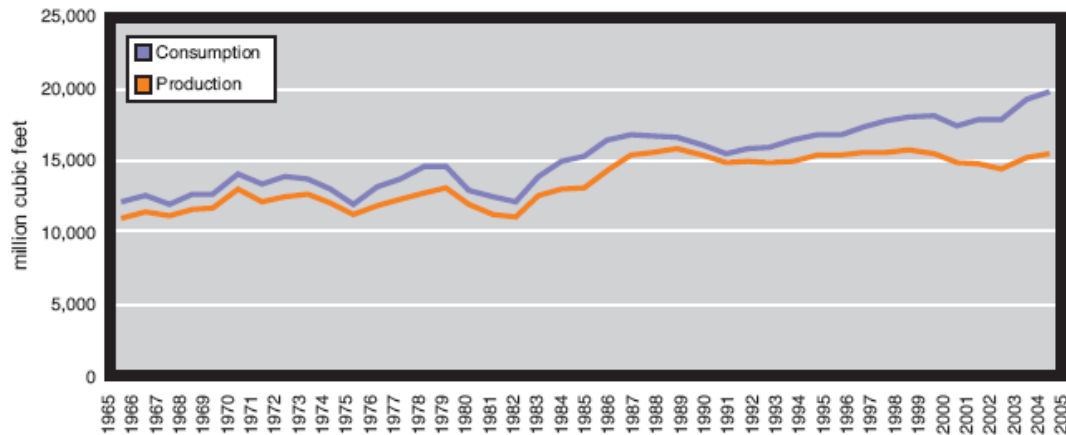


Figure 3. Total US. Production and Consumption of Timber Products, 1965-2005 (Alvarez 2007)

Overall consumption of hardwood lumber in the secondary processing industry has decreased significantly since 1999. It has decreased approximately 10% between 1999 and 2005. Market sectors that have reduced their consumption include: furniture (54% between 1999 and 2005) and pallets (16%). On the other hand segments that remained stable were millwork and railway ties. The cabinet industry increased its domestic consumption (33%); and flooring, which had been increasing, showed a decreasing trend between 2004 and 2006 (HMR 2007).

Table 1. Annual hardwood lumber consumption estimates in primary sectors from 1999 to 2005, in billion BF (HMR 2007)

Market Sector	1999	2000	2001	2002	2003	2004	2005
Pallets	4.5	4.4	4.0	4.0	4.0	4.0	3.8
Furniture	2.6	2.5	2.2	1.8	1.6	1.3	1.2
Exports	1.2	1.2	1.1	1.2	1.2	1.2	1.3
Millwork	1.3	1.3	1.3	1.3	1.3	1.2	1.3
Cabinets	1.2	1.2	1.3	1.4	1.4	1.5	1.6
Flooring	1.4	1.4	1.5	1.5	1.5	1.6	1.5
Railway Ties	0.7	0.6	0.7	0.7	0.8	0.9	0.9
Total Estimated	12.9	12.6	12.1	11.9	11.8	11.7	11.6
							27M m ³
Dimension and components	2.4	2.4	2.3	2.2	2	2	2.1

1 board foot = 0.002359 m³]

Exports and Imports

Exports

The U.S. wood exports are growing. Between 2005 and 2006 export growth was 7% reaching a total of \$6.3 billion in 2006 (USDA-FAS 2007b). Hardwood lumber, hardwood logs and softwood lumber showed the largest increases. Hardwood lumber accounted for 24% of total wood exports in 2006 (\$1.6 billion). Segments that decreased in exports included softwood logs, hardwood veneers and softwood chips. Softwood logs accounted for 13% of total wood exports in 2006 (\$790 million).

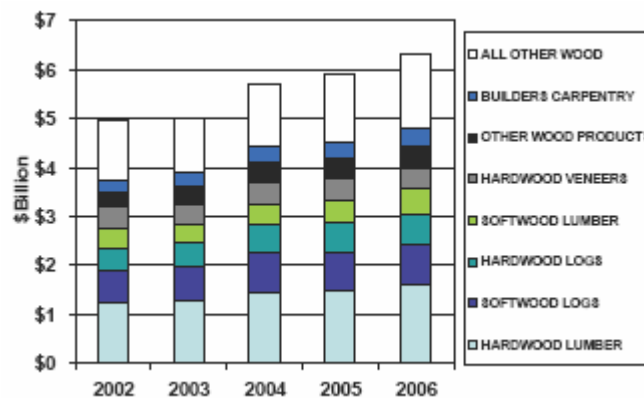


Figure 4. US Exports by Commodity (USDA-FAS 2007b)

Canada, Mexico, China, and Spain increased their imports from the U.S., while Japan, the United Kingdom, South Korea and Taiwan decreased their consumption of U.S. wood products. U.S. hardwood lumber exports were influenced by Europe's strong demand for interior and furniture applications, and tremendous growth of the furniture industry in China and Vietnam (USDA-FAS 2007b). U.S. exports of white oak hardwood lumber have increased during last five years, growing from \$271 million in 2002 to \$377 million in 2006 (USDA-FAS 2007b). Other important hardwood lumber species exported in 2006 were: red oak, maple, cherry and yellow poplar. The exports of softwood logs were influenced notably by the demand of Canada for spruce and the demand of Japan for Douglas-fir. These species are used mostly in structural building components, moldings, doors, windows and furniture.

Imports

In 2005 the U.S. imported approximately \$24 billion in wood products (excluding furniture). That was a lower growth rate than the year before. In 2004 the U.S. import growth was 38% respect to 2003, while in 2005 growth was 8% (HMR 2007). Figure 5 illustrates the proportion of wood products imported in 2005 into the U.S. It is estimated that imported furniture now constitute over 52% of all wood furniture being sold in the U.S. market. By 2006 the U.S. imported \$23 billion in wood and wood products (excluding furniture) that represents a 45% increase since 2002. The same year the U.S. imported \$17 billion in furniture and furniture parts (47% increase from 2002) (IWPA 2007).

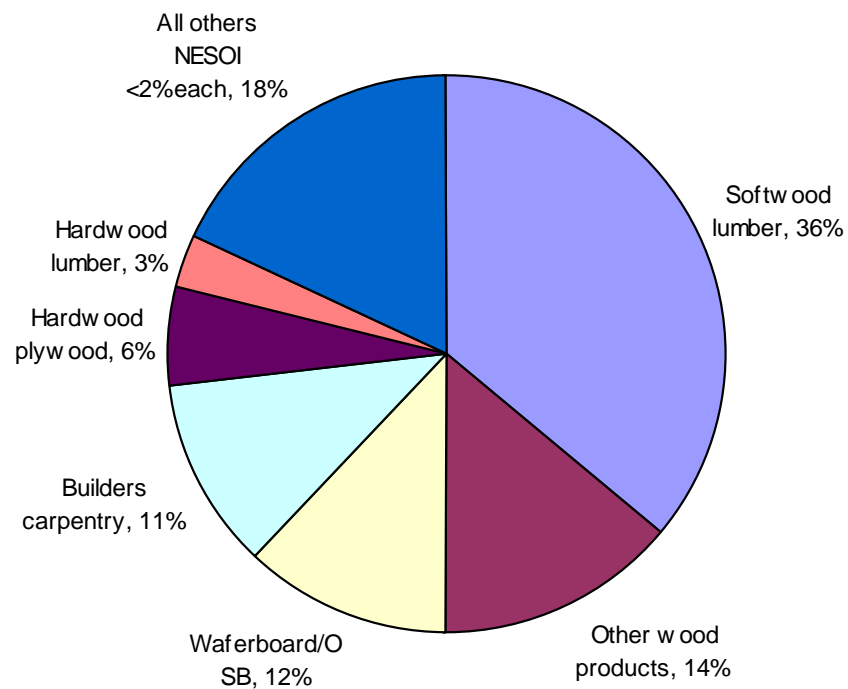


Figure 5. Imported Wood Percent by Sector in 2005 (HMR 2007)

It is expected that the growth of Chinese exports to the U.S. will continue in the range of about 8% growth per year for the next three years; maintaining its status of a major importer of roundwood and lumber, and a major exporter of finished wood products (International Wood Markets Group Inc. 2006). Table 2 shows the major commodities imported in the U.S. from

China where can be seen the impressive growth in all industry sectors, particularly in hardwood lumber and plywood.

Table 2. U.S. imports from China - selected commodities, million \$US (HMR 2007)

Description	2002	2003	2004	2005	January - September		
					2005	2006	Change
Other wood products ^a	857.2	941.6	1,028.0	1,112.4	808.2	868.9	7.5%
Hardwood plywood	70.1	115.3	346.2	492.9	353.2	595.8	68.7
Builders carpentry	44.6	62.3	133.5	192.6	140.4	222.4	58.5
Hardwood flooring	15.1	36.5	101.4	140.0	108.9	99.3	-8.8
Hardwood moulding	25.1	43.8	76.4	105.3	74.9	113.1	50.9
Hardwood veneer	5.6	11.1	14.3	16.2	12.4	15.6	25.3
Hardwood lumber	1.6	2.4	3.8	13.8	9.5	18.0	89.6
Hardwood siding	0.1	0.1	0.2	1.1	0.8	1.2	59.0
Others NESOI ^b above	41.7	63.9	126	215.7	157.9	252.8	60.1
Total	1,061.2	1,277	1,829.5	2,290	1,666.3	2,187.4	31.3

Note. ^aincludes poles, dowels, tool handles, boxes, etc.; ^bNot Elsewhere Specified Or Indicated; sums don't match due to rounding.

Even though Chile has signed many free trade agreements, they will unlikely influence the trade of forest products from and to Chile. Chile already had low tariffs to wood products before the agreements were signed (USDA-FAS 2007b). The state-of-the art mills in Chile also contributed to the growth of South American exporters of softwood plywood. Chile increased significantly the production of clear-faced radiata pine plywood from plantations since the late 1990s (IWMG 2006).

In summary, there have been changes in the trade balance of U.S. forest products between 2001 and 2005 (i.e. including furniture, pulp and paper materials). In 2004 and 2005 the imports of forest products increased 5% (i.e. increased \$2.4 billion reaching \$50 billion in 2005). In the same period, exports increased 9% (i.e. increased \$2.2 billion reaching \$27.8 billion in 2005). As a result, the trade deficit increased \$240 million between 2004 and 2005 (Alvarez 2007).

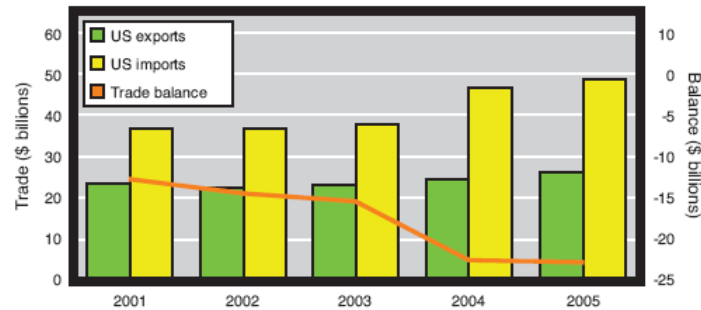


Figure 6. U.S. Forest Products Imports, Exports, and Trade Balance, 2001-05 (Alvarez 2007)

U.S. Imports of Tropical Timber.

Overview

The consumption of tropical timber products increased worldwide in 2006; logs, sawnwood, plywood and veneer increased 10%, 13%, 10% and 2% respectively. One-half of the Brazilian softwood is exported to the U.S. (UNECE 2007). The U.S. is the world's largest single-country importer of secondary processed wood products (SPWP). In 2005, the U.S. imported about \$5 billion of SPWP from ITTO producers (see Appendix A for a list of countries) (i.e. 33% of world SPWP imports and 11% more than 2004). U.S. imports of SPWP increased four-fold since 1996 and 68% in the last five years (ITTO 2007).

The U.S. consumes approximately 350,000 m³ of tropical hardwood lumber, which represents about 20% of the total hardwood lumber imported into the U.S. market. Despite their low volume market share, tropical hardwoods represent 40% of import revenues (i.e. tropical lumber is sold a higher price than U.S. domestic hardwood –almost two times). (Metafore 2004a). Metafore (2004a) has identified important characteristics for the competitiveness of tropical hardwoods in the U.S. marketplace such as the employment of the U.S. lumber grading system, drying capacity, appropriate manufacturing processes (dimensions), and understanding of transportation issues.

Major value-added market segments in the U.S. hardwood industry where tropical hardwoods have important participation are: decking, flooring and furniture. These markets, which require the processing of lumber or plywood, provide opportunities for manufacturers of tropical wood products to create and capture more value (Metafore 2004e). Regarding the

tropical wood species imported, it seems that demand likely will continue for traditional species, since U.S. importers are reluctant to try new wood species. Thus, common species per market segment are: ipe (*Tabebuia spp*) for decking, jatoba (*Hymenaea spp.*) for flooring, and mahogany (*Swietenia sp*) and Spanish cedar (*Cedrela odorata*) for furniture and specialty applications (Metafore 2004a).

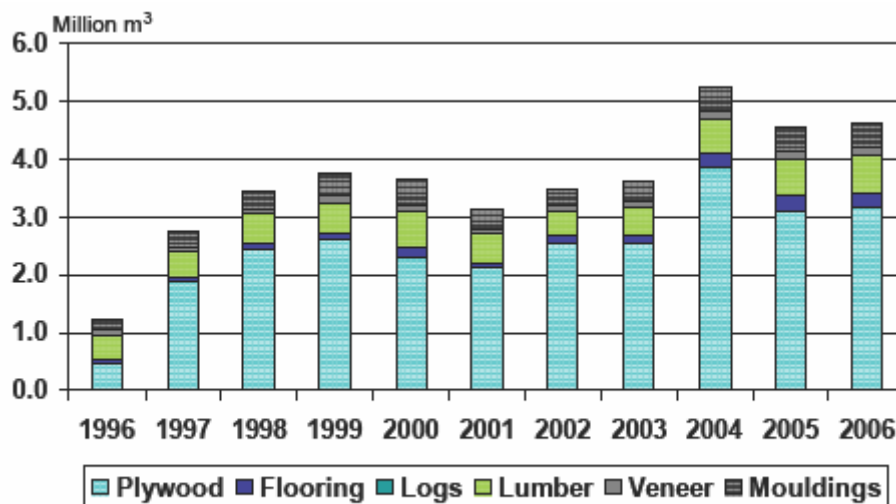
Although the U.S. is the major consumer of wood products in the world, it utilizes only 2% of the global consumption of tropical wood products (Goetzl and Ekström 2007). The U.S. imports of primary tropical wood products (roundwood equivalent) during the last decade. Tropical hardwood plywood accounted for an estimated 30% of overall hardwood plywood imported in 2006; tropical hardwood flooring accounted for 45% of wood flooring imports (Goetzl and Ekström 2007). Tropical sawnwood, even though its low volume, accounted for an estimate of 22% of all U.S. imports in 2006. Table 3 shows the imports of tropical wood products into the U.S. between 2002 and 2006 (Ekstrom and Goetzl 2007).

Table 3. Value of US imports of tropical wood products, 2002–2006 (million US\$) (Ekstrom and Goetzl 2007)

Segment	2002	2003	2004	2005	2006	Change 05/06 (%)	Change 02/06 (%)
Roundwood	0.8	0.8	1	0.7	0.9	29	13
Sawnwood	160	163	218	252	274	9	71
Plywood	322	326	547	476	531	12	65
Veneer	31	32	36	41	40	-2	29
Flooring	43	66	131	185	146	-21	240
Mouldings	52	54	77	78	81	4	56
Builders Joinery	266	285	372	419	509	21	91
Tropical hw total	875	927	1,382	1,452	1,582	9	81

It is estimated that the U.S. imported about \$1.6 billion of tropical wood products (not including furniture) in 2006. Imported wooden furniture products accounted for \$15.6 billion for the same year (approximately 20% from ITTO members, and 48% from China and Singapore) (Goetzl and Ekström 2007, ITTO 2006). It appears that the increasing trend observed in the imports of tropical wood products (excluding furniture) would remain constant at a 9% growth rate in value.

Some of the factors that will impact the utilization of tropical hardwood products in the U.S. are: a) the anticipated decline of the construction industry should not impact negatively the imports of tropical hardwood, since tropical wood market operates mainly in finished products such as flooring, decking, stock moulding and furniture; b) green politics against the emission of formaldehydes in the plywood industry or the utilization of endangered wood species; c) markets are shifting to more engineered wood products (particularly in flooring industry) and d) Free Trade Agreements (FTA) that the U.S. government is negotiating with potential exporters of forest products to the U.S. (Goetzl and Ekström 2007).



Source: WRI estimates

Figure 7. US Imports of Tropical Wood Products (Roundwood Equivalent) (Goetzl and Ekström 2007)

The U.S. imported 354,000 m³ of tropical sawnwood in 2005. Brazil is the major provider of tropical sawnwood to the U.S. with 104,000 m³ imported in 2005 (30% of overall tropical sawnwood imported). Other countries that export tropical sawnwood in considerable volumes include Peru (48,000 m³), Malaysia (35,000 m³), Ghana (31,000 m³), Côte d'Ivoire (26,000 m³), and Indonesia (23,000 m³) (ITTO 2007). Although the overall imports of hardwood lumber into the U.S. have increased significantly during last ten years (Figure 8), the imports of tropical hardwood lumber rose from 0.2 million cubic meters in 1995 to 0.4 million cubic meters in 2006. But the imports of temperate hardwoods surpass remarkably the imports of tropical hardwood. Imports of temperate hardwood increased from almost 0.6 million cubic meters to

nearly 1.5 million cubic meters in 2005 (Ekstrom and Goetzl 2007). These trends suggest that there exists in the U.S. a preference for Northern temperate wood species, i.e. substitutes for red oak or white oak, rather than tropical hardwoods.

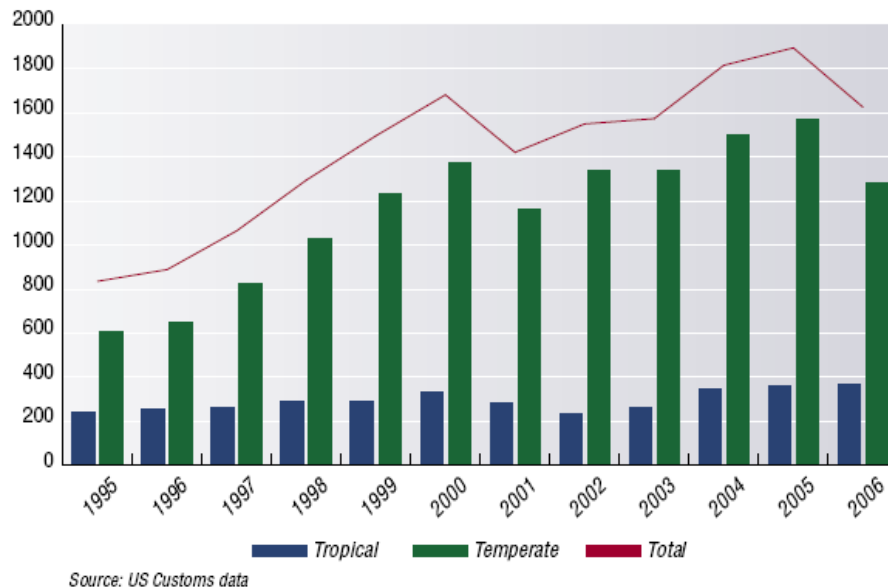


Figure 8. Hardwood lumber imports to the U.S. 1995-2006, ('000m³) (Ekstrom and Goetzl 2007)

Cossio (2007) assessed the importation of lesser known wood species into the U.S. In a survey to importers, retailers, distributors and manufacturers of tropical hardwoods it was found that companies are willing to increase their imports of tropical hardwood between 6% and 20% in 2007. Companies are disposed to try new wood species, and the preferred tropical wood species are garapa, ipe, sapele and wenge. However, companies commonly try less than five new wood species (LKS) per year.

Imported Tropical Wood Species

The growth in the imports of tropical wood products and the regulations on endangered wood species are some of the factors that brought about changes in the mix of wood species imported into the U.S. The decreasing trend in the importation of hardwood lumber made from mahogany (*Swietenia macrophylla*); while the imports of hardwood lumber made from “other tropical” wood species (i.e. those species that are not specified by the U.S. harmonized code) have increased remarkably since 2002. The common tropical hardwoods imported into the U.S.

in the hardwood lumber sector (these species are recorded under the harmonized system of the U.S.).

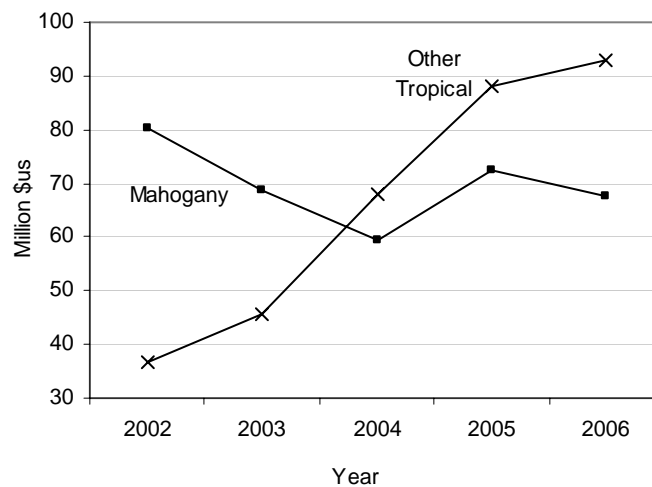


Figure 9. Trend of Imports of “Other Tropical” Species into the U.S. (USDA-FAS 2007a)

It is important to note that in 2007 the U.S. Census Bureau has incorporated more tropical wood species in its records of imported hardwood lumber. Thus, the market share of imported tropical species during the first semester of 2007. Besides the traditional tropical wood species imported, there are new species emerging with important market share such as ipe, sapele and jatoba. The increasing trend in the importation of tropical wood species into the U.S. makes possible the introduction of new wood species (lesser-known species –LKS) into the U.S. marketplace. There are at least 217 trade names of tropical woods imported into the U.S.; most of them are from Latin America (99), 65 wood species from Asia and 53 from Africa (Metafore 2004b, 2004c)

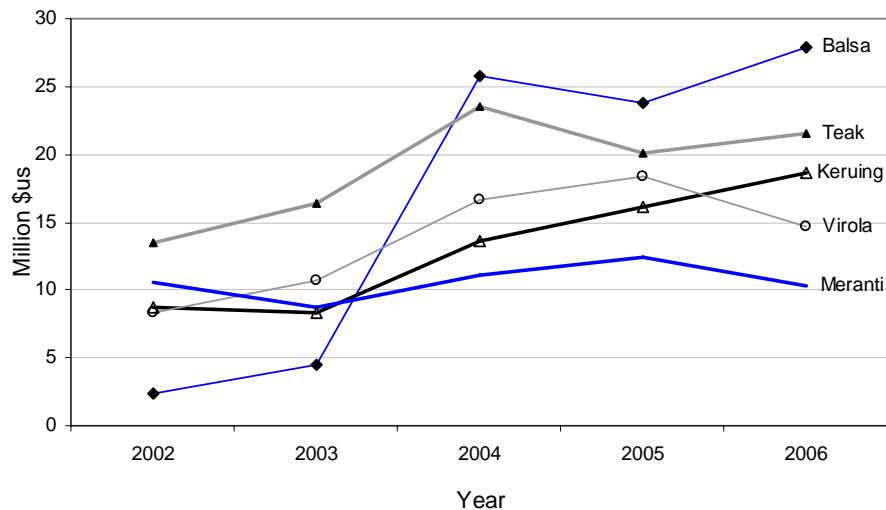


Figure 10. Common Tropical Species Imported into the U.S, 2002 – 2006 (USDA-FAS 2007a)

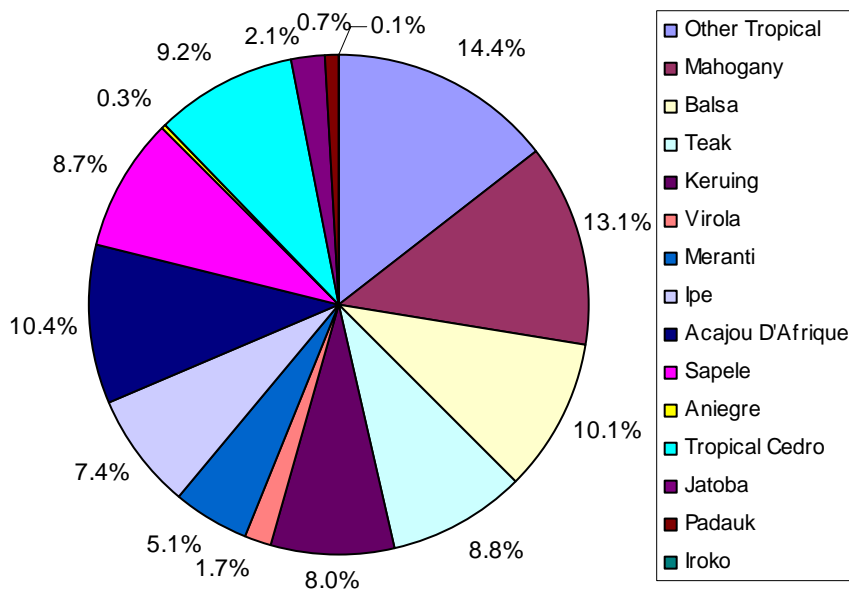


Figure 11. Market Share of Imported Tropical Wood Species in the U.S. in the Period January – June, 2007 (USDA-FAS 2007a)

Although tropical wood species have preference in the solid wood sector (i.e. decking, flooring, millwork or furniture), there also exists an important marketing opportunities in other market segments, such as decorative plywood and veneer. Table 4 shows common tropical wood species imported into the U.S. by relevant market segments.

Table 4. Major Tropical Wood Species Imported by Selected Market Segments

Market Segment	Wood Species
Plywood	faveira, amesclao, virola, tauari, parica, jatoba (GFTN 2004)
Veneer	sumauma, breu, virola, bandararra (GFTN 2004)
Millwork (doors)	mahogany, Spanish cedar, khaya, teak, Brazilian cherry
Flooring	bamboo, Brazilian cherry, bubinga, cork, cumaru, cypress, iroko, jarrah, mahogany, Brazilian maple, merbau, padauk, purpleheart, sapele, teak, wenge, ipe, jaboty and jatoba, (NWFA 2006)
Decking	ipe, cumaru, purpleheart, teak, jaboty, garapa, Brazilian cherry

U.S. Consumers and Tropical Forests Deforestation

Cossio (2007) conducted a research regarding the importation of tropical wood species and found that importers in general are not concerned about the environmental implications of the harvesting of tropical timbers from the rainforest. Importers are more concerned about the price and the regulations to the trade of illegal logging, rather than environmental certification. Surveyed importers stated that the only reason for importing certified wood products (i.e. from environmentally certified forests) is the corporate image or the final consumer demand.

Conversely, there exists a trend in the U.S. towards green building construction, use of energy efficient designs and materials, non toxic materials, and sustainably produced wood products. Consequently, this trend is unfavorable for the importation of non-certified tropical wood products. In addition, current chain-of-custody mechanisms, for tracking certified tropical timbers from the rain forest to the final consumer, seem to be poorly efficient, since more than 80% of the certified lumber is sold or used as uncertified (Duery 2006).

Cossio (2007) identified possible market segments for importing certified tropical wood products into the U.S. Thus, states such as California, New York or Florida, and market segments such as decorative veneer, flooring and decking are good alternatives for importing tropical wood products. About 65% of U.S. importers of hardwood products are planning to increase their imports of tropical hardwood products between 6% and 10%, even there are companies that are willing to import more than 20% of tropical hardwoods (Cossio 2007). SMFE from

rainforests should not expect premium prices for environmentally certified forest products. But there exist some states in the U.S. that are willing to pay premium for certified tropical hardwoods such as Texas, North Carolina, California, New York, Oregon and Wisconsin.

U.S. imports of tropical wood comprise 2% of overall U.S. consumption of secondary wood products. As a result they compete in the same markets than U.S. woods (hardwoods and softwoods), but in specific niches (Metafore 2004b). There are some markets in which substitute products can become a threat for imported tropical hardwoods. For example wood plastic decking, or engineered flooring. But the uniqueness of tropical hardwoods (texture, color, natural durability) make them suitable for high-end secondary wood products such as decorative veneer, garden furniture, doors, moulding, or decking. Tropical wood products hardly can compete with inexpensive indoor wood products such as interior doors or indoor furniture, where the drawbacks for SMEF are evident. SMEF from rainforests simply can not compete with economies of scale from China or Russia.

Relevant U.S. Market Segments for Tropical Hardwoods

Outdoor Decking

In 2002, the market of tropical decking represented only one percent of the residential decking market in the U.S. (a \$3 billion industry). The market share of residential decking in the U.S. The high durability of plastic decking encourages its use (lifespan of 50 years) over tropical lumber (lifespan of 20-30 years) and treated lumber (lifespan of 10-15 years) (Metafore 2004e). (SYP = Southern Yellow Pines).

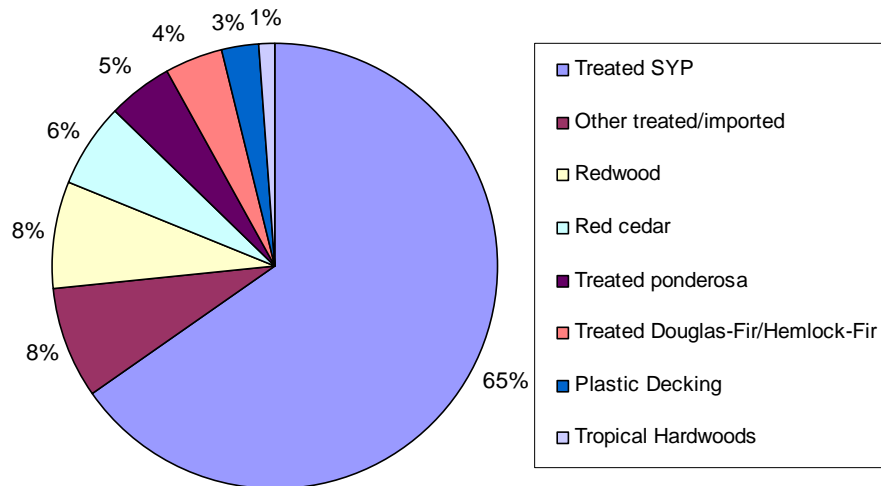


Figure 12. U.S. Residential Decking Market in 2001 (Metafore 2004e)

In a study by The Freedonia Group (2005b), the demand for decking was projected to increase at a rate of 2.8% per year through 2009. This market is due to more than 85% of the demand is generated by remodeling and improvements. The same study predicts that despite the increasing alternatives for decking construction, like plastic or aluminum, wood decking will remain the preferred material to produce and repair decks in the U.S., accounting for 81% of total decking demand in 2009. In a recent study, it was determined that approximately one-half of all new homeowners either buy a home with an attached deck or add one within five years. The U.S. decking market will reach \$6 billion by 2009. It is estimated that 60% of new homes come with a deck and 4% of all households add a deck each year (Berger Distributors and Contractors 2007)

Although pressure treated wood has the highest market share, for outdoor decking it is also ranked as the material “having the most problems” (Damery 2001, p. 1). The most important factors in the purchase decision include: quality, durability and installed stability (to reduce the risk of a deck to crash). Cost has an average impact. Tropical hardwoods were ranked as having the least performance problems. It is expected that the use of treated wood will change next years due to regulations in the use of chemicals like CCA (Morrison 2004). Fell et al. (2006) conducted a research to determine the consumer preference in the residential decking market in the U.S. during two time periods: 2000 and 2003. Their results revealed that consumer are much

more negative toward the use of treated decking (i.e. with chromated copper arsenic –CCA). Consequently, wood plastic decks are gaining market share.

In 2004 the Center for International Trade in Forest Products (CINTRAFOR) performed a study of home builders and deck builders across the U.S. to identify the material most used in decking construction (Eastin et al. 2005). In general, treated lumber is the preferred material for decking construction with 90% of market share (91.2% of decks use treated lumber in their substructure, 28.3% in the surface, and 27.8% in deck accessories). They also found that the material used in “deck surface applications” was dominated by wood-plastic composite products (39.6% of decks surfaces use this material). Wood-plastic composites are also the preferred material for accessories used in deck construction (29.5%). The third preferred material was western red cedar (10.8% of decks surface; 17.5% of deck accessories). The percentage of material used in each part of a deck (e.g. 60% of deck accessories were built using wood-plastic composites and treated lumber, and 18% were built from western red cedar) (Eastin et al. 2005). Synthetic decking materials comprise 15% of decks built and the number increases by 25% each year.

Customers’ purchase decisions (home builders or deck builders) is based primarily on material quality, and less on price. Consumers give more importance to high quality, durability (long life), visual appearance, and ease of maintenance (Eastin et al. 2005). Damery (2001) found that tropical hardwoods, eastern white cedar and Douglas fir also are utilized in decking construction in the U.S. Northeast, though in less extent.

Table 5. Percentage of Materials Used in Decking Construction in the U.S. (Eastin et al. 2005)

Material	Substructure	Surface	Accessories
Alaska yellow cedar	-	0.9	0.9
Western redcedar	0.7	10.8	17.5
Redwood	-	5.3	6.6
Treated lumber	91.2	28.3	27.8
Untreated lumber	6	1.5	1.8
Wood-plastic composite	0.6	39.6	29.5
Tropical hardwood	0.7	5.8	4.4
Plastic	-	4.2	4.8
Other	0.8	3.5	5.6

The preferred tropical wood species in the U.S. decking market is ipe (*Tabebuia spp.*), which is ideal for this market due to its high durability and requires little maintenance. Other common tropical wood species include: cambara (*Ruizterania albiflora*), masaranduba (*Manilkara sp.*) and cumaru (*Dipteryx odorata*) (Metafore 2004e).

Flooring

Figure 13 shows the trends of solid strip flooring shipments (i.e. million board feet of internal consumption), residential housing unit starts (annually), and the board feet used per start unit. The wood flooring market has strong correlation to residential housing starts. The use of flooring per start increased from less than 100 BF [0.236 m³] in the mid 80's to around 350 BF [0.825 m³] or so since the turn of the century (Brindle 2006). In 2005 the hardwood shipments in the U.S. reached 527.24 million sq.ft [49 million m²], the highest shipment since before 1966 (NOFMA 2006). The National Wood Flooring Manufacturers Association attribute this effect to the popularity of wood floors and the continued strength of new constructions and residential remodeling (NOFMA 2006).

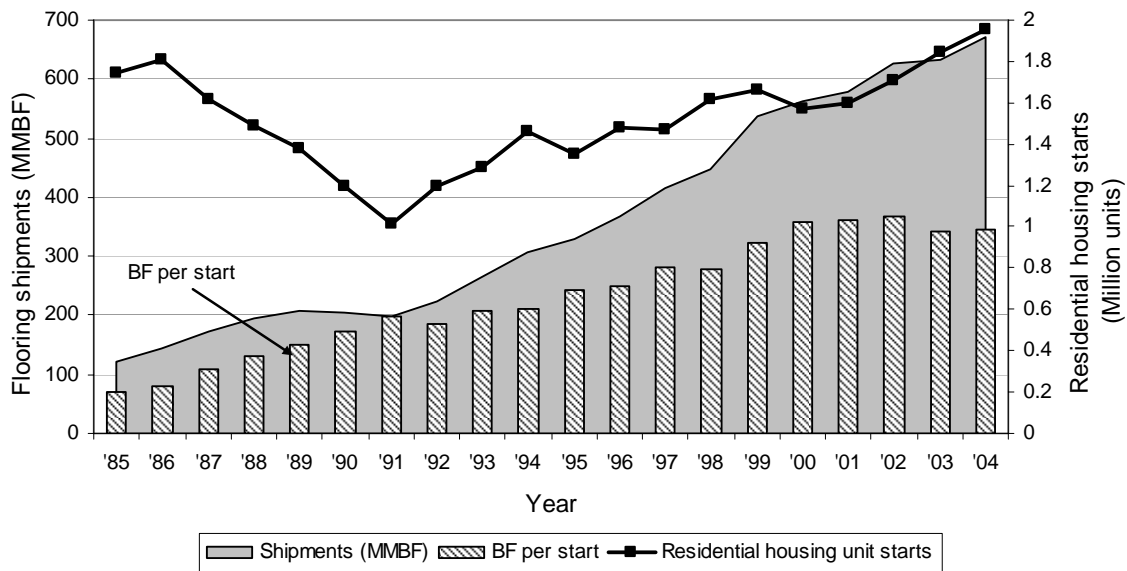


Figure 13. U.S. Flooring Shipments, Residential Housing Units Starts and BoardFeet Flooring Used per Housing Start, 1985-2004 (Brindle 2006)

In a study of wood flooring manufacturers in the U.S., McDaniel (2003) found that oak (red or white) is the preferred species for wood flooring with almost 80% of the domestic use.

Table 6 shows the common North American wood species used to manufacture flooring. But there is an increasing demand for exotic wood species, the NWFA estimates 50 wood species highly commercialized in the flooring market, as well as domestic and imported (NWFA 2006). However, other source estimates in more than 100 the number of exotic wood species used in flooring (Wood Floor Show Room 2006).

Table 6. Wood Species Used Among U.S. Wood Flooring Manufacturers(McDaniel 2003)

Species	% Used
Red oak	68.0
White oak	18.1
Hard maple	8.9
Hickory	1.2
Yellow birch	1.1
Ash	0.9
Cherry	0.8
Others	1.0

In a recent survey by Hardwood Floors Magazine, wood flooring contractors reported that 71% of wood floor related work was remodeling projects, while the remaining 29% was in new construction. They also reported Contractors are selling 76% unfinished, vs. 23% going to prefinished engineered and prefinished solid (Wood Floor Show Room 2006). The U.S. hardwood flooring is a market of about \$1.4 billion per year. The market share of tropical hardwood in the U.S. represents approximately 10% (\$150 million). The latest market research from Specialists in Business Information Co. (SBI) –a division of MarketResearch.com, indicates that the market for wood flooring in the U.S. will continue growing at a compound annual rate of 7% from 2006 to 2010, bringing the demand for wood flooring at the end of the decade to more than \$3 billion.(FORDAQ: The Timber Network 2006). The same firm projects that oak flooring will continue to dominate demand with more than 50% of the U.S. market.; much of the demand is coming from do-it yourselfers (FORDAQ: The Timber Network 2006). In a similar study The Freedonia Group (2005a) estimates that the U.S. demand for hard surface flooring will grow 5.5% annually through 2009 (N.B. it includes ceramic and wood flooring).

The tropical hardwood flooring market in the U.S. is affected by the outsourcing of U.S. domestic flooring, when China is becoming and important intermediary for products whose final

destination is the U.S. (Metafore 2004e). Although wood floors, as most hard surface floors, shows an increasing trend, hardwood floors account for about 7% of the flooring market. One of the larger wood flooring producers predicts that share will double in the next five years (Wood Floor Show Room 2006). “The U.S. wood flooring manufacturing industry has largely been sheltered from foreign competition. Four short years ago, imports represented only 2% of the market. By 2004, however imports have exceeded 10% of the hardwood flooring market” (International Wood Markets Group Inc. 2006).

The imports of hardwood flooring between 2002 and 2006 into the U.S. In general, imports have decreased in 2006. China and Brazil are the major exporters of hardwood flooring to the U.S. with approximately \$105 million and \$63 million respectively in 2006. Since 2003 imports of hardwood flooring from Canada have decreased dramatically from almost \$40 million to \$10 million in 2006. Imports from France, Taiwan and Malaysia remain stable and only Spain showed an important growth (from \$6 million to \$12 million between 2005 and 2006) (USDA-FAS 2006).

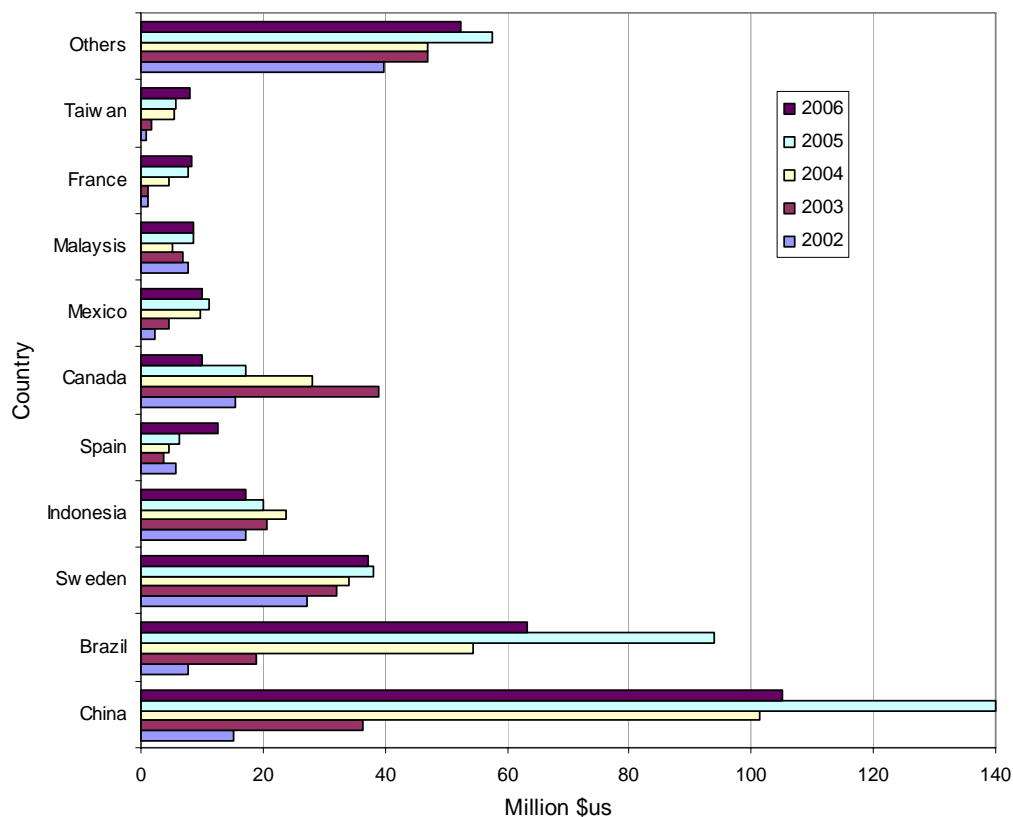


Figure 14. U.S. Imports of Hardwood Flooring, 2002-2006 (USDA-FAS 2007a)

Figure 15 shows the main U.S. states of entry for imported hardwood flooring. California (16%), Florida (18%) and New York (16%) ports of entry comprehend 50% of overall hardwood flooring imports. Other important ports of entry include: Washington (7%), Georgia (7%), Virginia (5%) and South Carolina (4%) (USITC 2006). California is also the state that demands more parquet (a sub group of overall hardwood flooring) than any other state in the U.S., and Los Angeles is the main city.

Approximately 46% of the imported parquet comes from Sweden and 18% from China, other important states are New York with 20% of the overall parquet imports, and Georgia with 13%. Although Alabama and Massachusetts show low market share, they are increasing its participation showing growths of 251% and 35% respectively (Ministerio de Comercio Exterior y Turismo del Peru 2005).

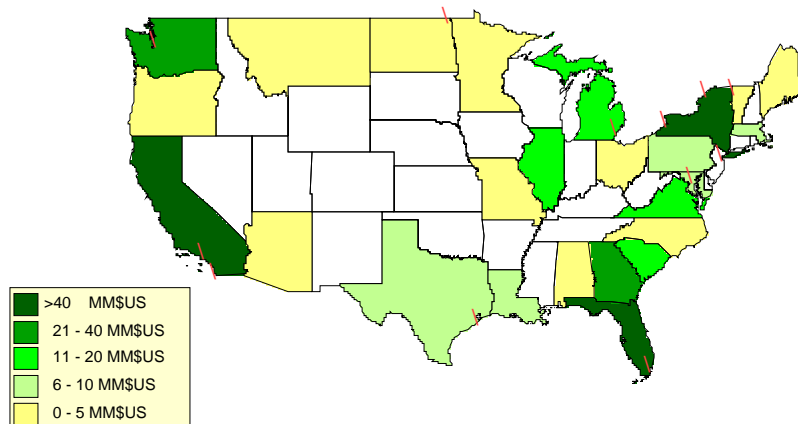


Figure 15. U.S. Imports of Hardwood Flooring by Customs District of Entry (USITC 2006)

Particularly, there is a trend in the use of exotic species in the western of the U.S. Bamboo flooring is also gaining popularity in the West Coast and Southeast (Wood Floor Show Room 2006). The market of flooring is extremely competitive. The competition can be divided as follows:

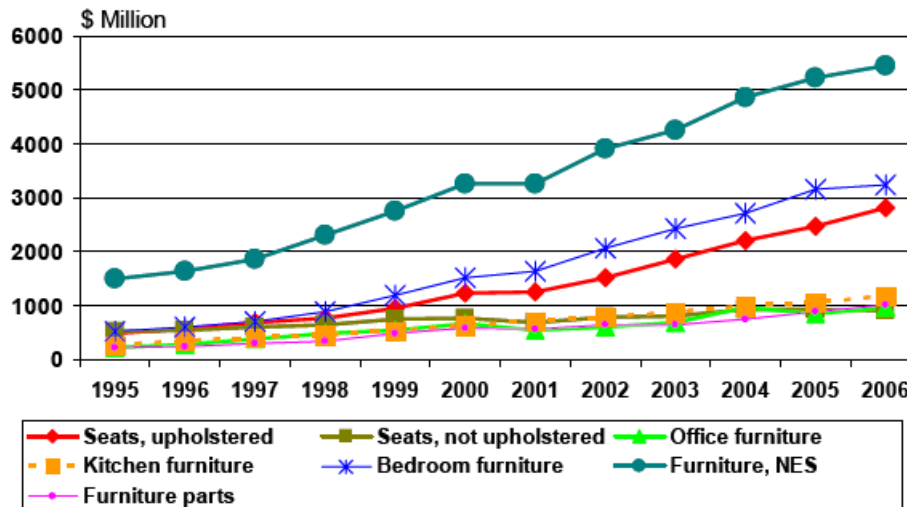
- *By type of floor:* with the market trends showing consumers moving toward more hard-surface flooring in new homes and renovations, both hardwoods and ceramics will likely continue to take market share away from carpet, vinyl and rubber flooring.

- *By type of wood floor.* Because the current trend to DIY wood floorings (ease of installation) there is a trend to use engineered flooring rather than solid strip flooring (Wood Floor Show Room 2006).
- *By country.* China and Brazil are the benchmark of imported wood flooring. Although there is an important growth in the imports from South American countries, Asian countries are growing faster such as Taiwan and Malaysia.

U.S. manufacturers are concerned about the effect of the current Chinese expansion in the flooring market, anticipating the same effect observed in the furniture industry currently. Now U.S. manufacturers, distributors and importers have started to shift they sourcing from overseas (mainly China) in order to obtain a competitive price advantage in the U.S. The U.S hardwood flooring market is highly consolidated, with the top five players holding more than 60% of the market (IWMG 2006). “Chinese flooring imports are a serious threat to U.S. flooring manufacturers, particularly producers of engineered flooring” (IWMG 2006).

Outdoor Furniture

The U.S. wood furniture industry is likely the sector that has experienced the impact of globalization the most. Many U.S. wood furniture manufacturers took advantage of lower production costs from countries such as China to outsource part or all of their production to overseas. “Big box” retailers also took advantage of lower prices for importing inexpensive furniture. Consequently the U.S. has more than doubled the imports of wood furniture during the period 1999-2006 (i.e. from \$6.7 billion to \$14.4 billion). It is estimated that 75% of the wood furniture and parts imported from ITTO producers (see Appendix A for a list of countries) into the U.S. likely utilize significant volumes of tropical hardwoods. Greater China and Singapore probably export lower proportion of tropical hardwoods (estimated in 50%) (Goetzl and Ekström 2007).



Source: GTIS and ITC

Figure 16. U.S. Imports of Wood Furniture and Parts (Goetzl and Ekström 2007)

The interest of US consumers for outdoor furniture seems to be stabilized. The US deliveries of outdoor furniture (of all types) were estimated in \$2.34, \$2.39 and \$2.17 million in 2002, 2001 and 2000 respectively. California was the major state consumer of outdoor furniture in 2001 (25% of overall deliveries), followed by Texas (7.1), Florida (5.5), New York (4.6), Washington (4.3%) and Arizona (3.9) –the rest of states totalized 50.2% (Ministère des Ressources Naturelles; de la Faune et des Parcs 2004). The demand for outdoor furniture and grills (\$5 billion industry) will grow 5.4% annually through 2008. The increasing popularity for decks, patios and porches contributes to this phenomenon.

Metal outdoor furniture is the preferred material in the U.S., accounting for 60% of total demand in 2003 (within this market, tubular aluminum remains popular due to its lower cost over wrought iron or other metal outdoor furniture). Plastic outdoor furniture (17% of total demand in 2003) is expected to be the fastest growing material due to its ease of caring, high durability, and the introduction of many up-scale designs into the market. Wood represented approximately 5% of the demand of outdoor furniture in 2003. Even though the private residential market represents the dominant market for outdoor furniture (over 90% of total demand in 2003), it is expected that the non residential market will experience the most rapid growth through 2008 due to the anticipated growth in the construction of restaurants, hotels and motels (most important

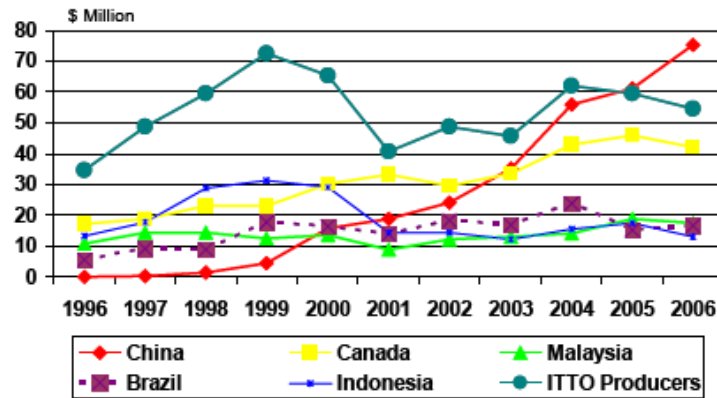
nonresidential consumers of outdoor furniture). The Western and Southern of the U.S. is the largest and fastest growing market due to its weather rather than its economic or population growth (The Fredonia Group 2004).

Moulding and Millwork

There is a great variety of products that can be found in the U.S. millwork industry, such as doors, windows, moulding and several wood assemblies for construction. “Wood entry door” is the major joinery product relevant to the tropical timber producers. It is estimated that 15 million entry (exterior) doors were sold in the U.S. in 2005 (approx. 63 million interior doors). Nevertheless, steel-made doors dominate the market of entry doors and wooden exterior doors represent only 10% of the market, i.e. approximately 1.4 million wood entry doors were sold in 2005 (Goetzl and Ekström 2007). Solid wood interior doors are unusual in the U.S.; a small percentage is manufactured for up-scale housing, and tropical wood species such as mahogany are commonly used to this purpose.

The market for molding is expected to grow in a rate of 3.7% annually through 2008, This is a very diversified market, with products that meet almost any specific need and budget. The competition is not among species of wood, but among other materials such as plastic moldings (estimated growth of 7% until 2008). Metal moldings and other engineered products (including MDF) will grow by 6.1% annually. It is projected that wood-based moldings will grow only 2.1% annually (Shutt 2006).

It is estimated that the imports of tropical hardwood mouldings into the U.S. reached \$81 million in 2006. That is 50% of overall hardwood moulding imports (\$192 million in 2006). From mid 1990s to 2005 the imports of hardwood moulding increased from \$65 million to \$200 million; but they decreased to \$192 million by 2006. China has increased its market share of U.S. imports of tropical moulding from 15% (in 2002) to 39% (in 2006). On the other hand Canada’s share has declined from 27% to 23% in 2006. While the species mix of Chinese mouldings include hardwoods and softwoods, the mix of ITTO producers are mostly hardwoods, accounting to 28% of overall mouldings imported into the U.S. Brazil, Malaysia and Indonesia did not show significant changes (Goetzl and Ekström 2007).



Source: GTIS and ITC

Figure 17. U.S. hardwood moulding imports, 1996-2006 (Goetzl and Ekström 2007)

There are two types of mouldings in the U.S. market: 1) stock mouldings (sold through retailers or contractor yards), and 2) custom moldings. Custom mouldings are more frequently in small firms that work for custom orders. However, some importers of tropical hardwoods produce custom moldings in their yards (Goetzl and Ekström 2007).

Opportunities for small to Medium-Sized Producers

Definition and Significance of SMEs and SMFEs

The common criteria to define micro, small and medium size enterprises (SMEs) are based on headcount (Annual Work Unit -AWU), annual turnover, or total annual balance sheet. Since such classifications differ among countries, the definition adopted in this study is based on the recommendations of the European Commission according to the number of employees. Thus, enterprises that have less than 10 employees are classified as micro-enterprises (commonly referred as Small Office/Home Office –SOHO). Enterprises with less than 50 employees are considered small businesses, and companies with number of employees less than 250 are considered medium-sized enterprises (European Commission 2006). The working definition of Small and Medium-sized Forestry Enterprises (SMFEs) is: "...business operation aimed at making a profit from forest-linked activity, employing 10-100 full-time employees or with an

annual turnover of US\$10,000-US\$30 million, or with an annual roundwood consumption of 3,000-20,000 m³.” (Mayers 2006, p. 1).

It is estimated that small and medium-sized forestry enterprises (SMFE) represent 80% to 90% of forest enterprises in developing countries (IIED 2007). This sector (SME) is often overlooked as a good contributor to the economy. However, estimations suggest that more than 50% of overall forest sector employment is generated by SMEs, more than 20 million people are formally employed by SMEs (140 million informal), and \$130 billion per year of gross value added is produced by SMEs worldwide (IIED 2007). Domestic markets in tropical regions are dominated by SMFEs, since it is estimated that only 5% of overall wood that comes from the forest is exported (commonly through large-scale firms), 10% is consumed locally, and 85% is used as fuel (Mayers 2006).

Since large proportion of the tropical timber imported into the U.S. comes from developing countries, it is important to understand the social, economical and legal environment where SMFEs operate in those countries. In spite of the important contribution of SMFEs to the economy, many SMFEs operate within the informal sector (also called shadow, hidden, illegal, or underground economy –or simply unregistered and/or evading taxes). The informal economy in developing countries ranges from 13% to 76% of their GDP (Africa between [39-76%], Central and South America [25-60%], and Asia [13-70%]) (Kozak 2007).

Opportunities in the U.S. Market for SMFEs of the Tropical Forests

SMFEs in the U.S. contribute over 37% of the total employment in the solid wood products processing sector (Kozak 2007). Despite the dramatic decrease in employment, there can be seen an increasing contribution to employment from firms with fewer than 100 employees and particularly from firms with fewer than 20. In the case of the wood furniture industry in the U.S., the impact of imports from China brought about the emergence of SMFEs to fulfill the smaller, but sizeable niche markets (mostly urban) that are demanding higher end furniture which incorporates strong design aesthetics and is not mass produced. SMFEs in the tropics can take advantage of the fragmentation of the U.S. wood furniture industry to provide low volume and aesthetic wood species to this sector.

Trends of the contribution of SMFEs to the employment in developed nations include: 1) the growth of “small” SMFEs seems to be outpacing that of “medium-sized” ones; and 2) there is

a “value-addition” effect, with opportunities for growth being more abundant in the value-added sector. The commodity sector definitely is not a good market for SMFEs in developed countries such as the U.S., likely due to a high degree of competitiveness, the need to achieve economics of scale, and high capital requirements (Kozak 2007)

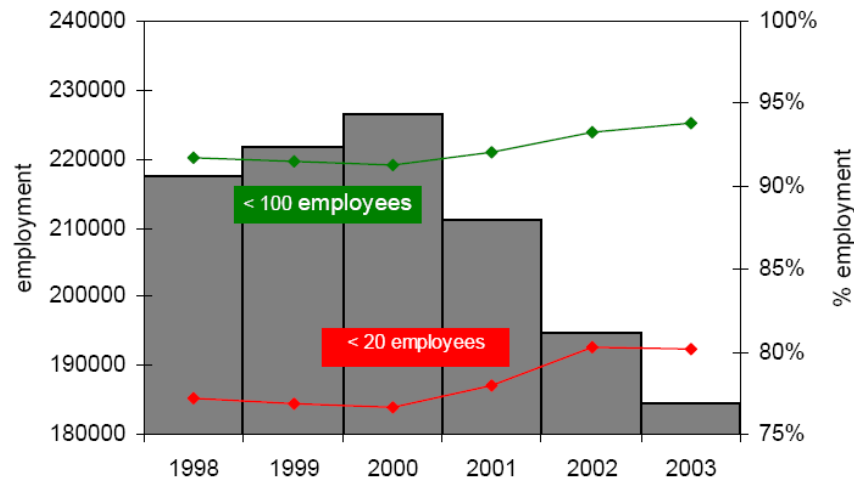


Figure 18. Total Employment and Proportion of Employment Attributed to Firms with Fewer than 20 and 100 Employees in the U.S. Wood Household Furniture Sector (Kozak 2007)

Despite the apparent, it is evident that there are good marketing opportunities in the U.S. for tropical timbers. The imports of tropical timbers are increasing, and it seems that the still be will increasing. “...tropical lumber producers who succeed in the U.S. lumber market are those that can dry the product effectively, comprehend and exploit U.S. lumber grading systems and maintain a broad knowledge of transportation issues.” (Metafore 2004a).

Price is not rated as important factor for importers of tropical hardwoods. Thus, SMFEs should focus on establishing long-term relationships with importers, distributors, or manufacturers, providing consistent supply and reliable delivery. Environmental friendly certified tropical hardwoods would have competitive advantage, although at no premium prices (Metafore 2004d). Fostering the associations between SMFEs can provide good opportunities for accessing markets where mass production is required. Such associations can be benefited by the support of NGOs or government in promotion, training and forest management (Cass 2006).

There are some opportunities to capitalize in the wood products industry in the U.S., considering demographic trends. SMFEs should realize that certain products are at the mature or

declining stage of the product (e.g. plywood) and new products should be developed. In order to compete with economics of scale, SMFEs must remain competitive by getting more involved with the housing industry and the supply chain to homebuilders (Schuler and Adair 2003). Companies in the tropics may focus on developing “custom wood products” in order to capture specific market niches and reduce cycle times. The latter means that SMFEs should be in narrow contact with builders and their associations to understand their needs, “...the wood products industry must jettison their commodity orientation...” (Schuler and Adair 2003, p. 16).

Even though the Chinese impact in the U.S. hardwood flooring market, there exist some opportunities for SMFEs of the tropics in the fixed-width lumber, which remains strong in the U.S. market. There exist another opportunity in pre-finished wood flooring products, where lighter species have advantage due to their ease in staining (Metafore 2004e). SMFEs that manufacture decks from tropical hardwoods should meet the standards and design required in the U.S. marketplace. Combination of milling practices, technology and services should consider the following factors (Metafore 2004e):

- Provide margin for errors in dimensions to compensate variations in wood and site design
- It is not require drying capacity, since the moisture content of decking varies from 15% to 25%
- Tongued/grooved decking offer great opportunities for tropical producers, due to its high cost in the U.S. market. However, this endeavor would require appropriate technology and skills to meet the U.S. standards.

Experiences in the European region (UNECE) should be taken into account to anticipate the way SMFE could capitalize in the U.S. The opportunities for exporters in developing countries (to UNECE region) lie primarily in the following fields: 1) forest certification and certified forest products, 2) plantations, 3) lesser-known species, 4) voluntary timber licensing system, 5) processed added-value timber products, and 5) e-commerce (Monster and Bijl 2004).

Tropical sawn timber continues to face environmental criticism in important export markets. In addition, the related transport costs are much higher in comparison to using temperate timber (commonly from Sweden and Finland). Moreover, some of the major timber exporters such as Malaysia, Indonesia and Brazil are expected to continue to cut their exports of

primary products in the future because of the growing domestic consumption, and due to the expansion of further processing for exports. Thus, SFMEs in developing countries should increase their building capacity for secondary processing tropical wood products.

The identification of appropriate lesser-known wood species (LKS) is crucial for accessing specific markets. For example in The Netherlands (the leader European country in researching LKS) the following lesser-known wood species have identified market: *Callophyllum spp*, (Solomon Islands), *Goupia glabra*, *Hymenaea courbaril*, *Mezilaurus itauba*, *Euxylophora paraensis*, *Micropholis guianensis*, *Hymenolobium spp*, *Diplotropis purpurea*, *Bagassa guianensis* (Brazil), and *Lecythis spp* (South America) (Monster and Bijl 2004) There are many LKS that are been testing in The Netherlands with promising future in construction of roads, water facilities such as bridges, and garden furniture. However, private companies in the construction industry are more interested than the housing construction (Monster and Bijl 2004).

An overlooked competitive advantage for SFMEs in the forest products industry is the e-commerce. More and more timber and timber products are traded via e-commerce. Companies worldwide are gradually converting to e-commerce driven in order to improve the planning and management of sourcing, transport and storage of products. At the same time to reduce production and logistic costs. Specialized web sites focused on e-commerce are more common, such as timberweb, globalwood, or International Timber Exchange (Monster and Bijl 2004).

Concluding Remarks

This report gives some insights of the importation of tropical wood products in the U.S. and highlights opportunities for foreign SMFEs that want to access (or increase their exports) to the U.S. tropical wood market. Literature review suggests that outdoor decking, flooring and outdoor furniture are important growing markets for tropical hardwoods. Moreover, specific niche markets within these segments are identified for tropical hardwoods (e.g. tongue/grooved decking, or pre-finished solid flooring). The opportunities (and recommendations) stated for SMFEs are general guidelines based on trends observed in the U.S. marketplace for tropical hardwoods. However, specific considerations should be taken into account for particular countries (e.g. African countries will find different competitive advantages than Latin American countries). This report does not consider any particular case.

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Appendix A. List of ITTO Member Countries**PRODUCERS****Africa**

Cameroon
Central African Republic
Côte d'Ivoire
Democratic Republic of Congo
Gabon
Ghana
Liberia
Republic of Congo
Togo

Asia & Pacific

Cambodia
Fiji
India
Indonesia
Malaysia
Myanmar
Papua New Guinea
Philippines
Thailand

Latin America

Bolivia
Brazil
Colombia
Ecuador
Guyana
Honduras
Panama
Peru
Suriname
Trinidad and Tobago
Venezuela

CONSUMERS

Australia

Canada

China

Egypt

European Union

Austria

Belgium/Luxembourg

Denmark

Finland

France

Germany

Greece

Italy

Netherlands

Spain

Sweden

United Kingdom

Japan

Nepal

New Zealand

Norway

Republic of Korea

Switzerland

United States of America