

Draft Report:

**Competitiveness of Tropical
Timber Products at Major
International Markets;
Trends and Opportunities for
small and medium scale
producers in developing
countries**

by

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Executive Summary

This study focused on the following information:

1. Summarized data of tropical timber goods exchanges in and among major Global Markets;
2. Summarized data of tropical timber competition at major global markets;
3. Main drivers of competitiveness and market demand;
4. Emerging drivers.

❖ Trends of Major Markets:

➤ U.S.:

- Demand in the US market for wood-based goods is closely linked to the construction sector, which is based on new housing constructions and renovations
- Severe reductions in emissions levels of urea formaldehyde are requested by California Air Resources Board (CARB) for MDF's and hardwood plywood. CARB's rules set different standards for each different type of board and phases of application, affecting the tropical plywood niche.

➤ ASIA:

- Demand of wooden goods in Japan's market has changed over the historic period of time
- Total demand of wood in Japan is decreasing at an average rate of 2% per year, since 2000
- China's wood products demand will continue to rise in line with the growth of population and income

➤ Europe:

- European purchasing power, especially Italy, becomes weaker and as a consequence, taxes to the government by young persons decrease, pension rates increase progressively and public spending constrains affects the entire economy
- Today tropical timber is purchased by industrials and distributors, based on the merits of the inherent characteristics of each species
- The French market is the most species-flexible of all tropical timber importing countries
- Low levels of new constructions are expected in Spain and Portugal

❖ Major Market Analysis

- The six major markets analyzed have as a common issue the relation between housing and wood consumption

- Imports of tropical roundwood have remained at low levels with a declining trend. Factors such as logs exports prohibition in supplier's countries, environmental issues, high transportation costs, processing labour costs, lower prices and better qualities of non tropical logs are all contributing to this decline in trade of tropical logs.
- Through all the traditional products (logs, sawnwood, furniture), plywood has remained more or less stable, and trends indicate it may remain that way; nevertheless, competition with cheaper raw materials is menacing these products.
- Fuelwood is slowly increasing in major markets; it is a niche where some advantages could be taken for tropical fuelwood (pellets and charcoal for example).
- decreasing log exchanges and increasing exchange in processed products have changed the way wood is transported (containerization of the timber-products trade)
- Issues of environment and competitiveness are increasingly linked as never before
- The Financial crisis is a key aspect to the house building demand

❖ Opportunities

- Certification (as CoC or SFM) is an important factor to open or maintain market's niches. Production philosophies as the "green production" or fair trade would permit suppliers countries to reach competitiveness regarding environmental, social and economic issues. New requirements by main markets (Green Building codes, E2commerce) give the opportunity to open new market niches. Initiatives like the EU FLEGT provide opportunities as well as threats in the international market.

❖ E-Commerce

- China's e-commerce development is a step behind compared to the European countries and the U.S.
- E-commerce is expected to increase in the coming 6 years though actual economic crisis
- E-customers will search for different key aspects, such as final prize, transportation costs and delivering times
- The cross-border potential of e-commerce seems not to be fully exploited yet

ii. Abbreviations

- APO: Asian Productivity Organization
- B/L: Bill of Lading
- CARB: California Air Resources Board
- CoC: Chain of Custody
- E2Commerce: Electronic-Eco-Commerce
- E-Commerce: Electronic Commerce
- EWP: Engineered wood products
- FLEGT: Forest Law Enforcement, Governance and Trade
- FSC: Forest Stewardship council
- GP: Green Production
- GSC: Green Supply Chain
- ISO: International Standard Organization
- ITTO: The International Tropical Timber Organization
- MDF: Medium Density Fibreboard
- PEFC: Pan European Forest Certification
- SFI: Sustainable Forestry Initiative
- SFM: Sustainable Forest Management
- SPWP: Secondary Processed Wood Products
- VOC: Volatile Organic Compound
- WBP: Wood Based Products
- VOC: Volatile Organic Compound

1. Introduction

At the present time, trade in wood and woods products has increased at regional and global levels. However, over the last decades these commodities are facing increased competition from non-wood based materials, even in specific market segments where “wood” was traditionally been consider as the main raw material.

For several of these wood products, the raw material supply comes mainly from timbers harvested in tropical natural forests. Competition with other materials such as plastics or metals, as well as competition with timbers from temperate and boreal regions is seriously affecting wood products’ competitiveness, reducing the market share for tropical timbers supply in niche markets (such as window and door frames, external decking, garden furniture,...).

Competition among materials and competition between tropical and non-tropical timbers is fully acceptable. However, a loss of competitiveness of forest-based products in general, in particular those from the tropics, may have serious impacts on the financial viability of sustainable forest management and particularly of natural forests in the tropics. This decreases the attractiveness to maintain land under forest cover, especially of natural forests in tropical countries, hence increasing deforestation pressures.

In order to understand the competitiveness of wood products, it is important to consider that major market requirements (e.g. quality, quantity, prizes, etc) vary between products. Then it is not possible to consider only standard-made goods. We also need to consider the fact that suppliers’ ability to produce goods varies enormously among them too; therefore the global wood market is a very complex matter to study.

Major global markets, most of the times, are far away from main suppliers. Then aspects of international logistics are essential to describe when it comes to analyzing the competitiveness of tropical timber goods.

Certification is another key issue for any trade in major timber markets, and data confirmed that it is very important to encourage suppliers’ countries to fully complete processes of

certification in order to fulfil international requirements; remembering always to find a balance between costs and prices.

Increasingly e-trade opens up the door to new ways of wood goods exchange, which should be analyzed in order to understand future competitiveness regarding new e-commerce's philosophies.

Therefore this study is focusing on the following components:

1. Summarize data of tropical timber goods exchanges in major Global Markets
2. Summarize data of tropical timber competition in major global markets
3. Describe main aspects regarding competitiveness of major markets' demand
4. Describe possibly new aspects of future major markets

3. Competitiveness Definition:

Regarding the main topic of this research, it is vital to clarify the competitiveness meaning. Therefore according to Sasatani's Working Paper (FAO 2008) definition, "competitiveness is the ability to produce goods more inexpensively in the sector in a nation than the sectors in other nations"; this definition is based on the productivity concept as the most important variable of competitiveness.

A more applicable definition would be: "the degree to which a country can, under free and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long term" (Garelli, 2001) in which it would be important to add the social aspect as improvement of suppliers welfare conditions and low environmental impact, specially when considering Forest issues.

Recent indicators of competitiveness make reference to prosperity that a country can achieve and maintain over a period of time, and as explained by Sasatani (FAO 2008) "Those indicators represent national overall competitiveness and may be very different from the competitiveness of forest sectors in the nations because the importance of the forestry sector is likely to be very different in different parts of the world."

3. Description and Trends in Major Markets

In this report, six of the major world's markets are reflected: U.S.A., Japan, China, Italy, France and the Iberian Countries.

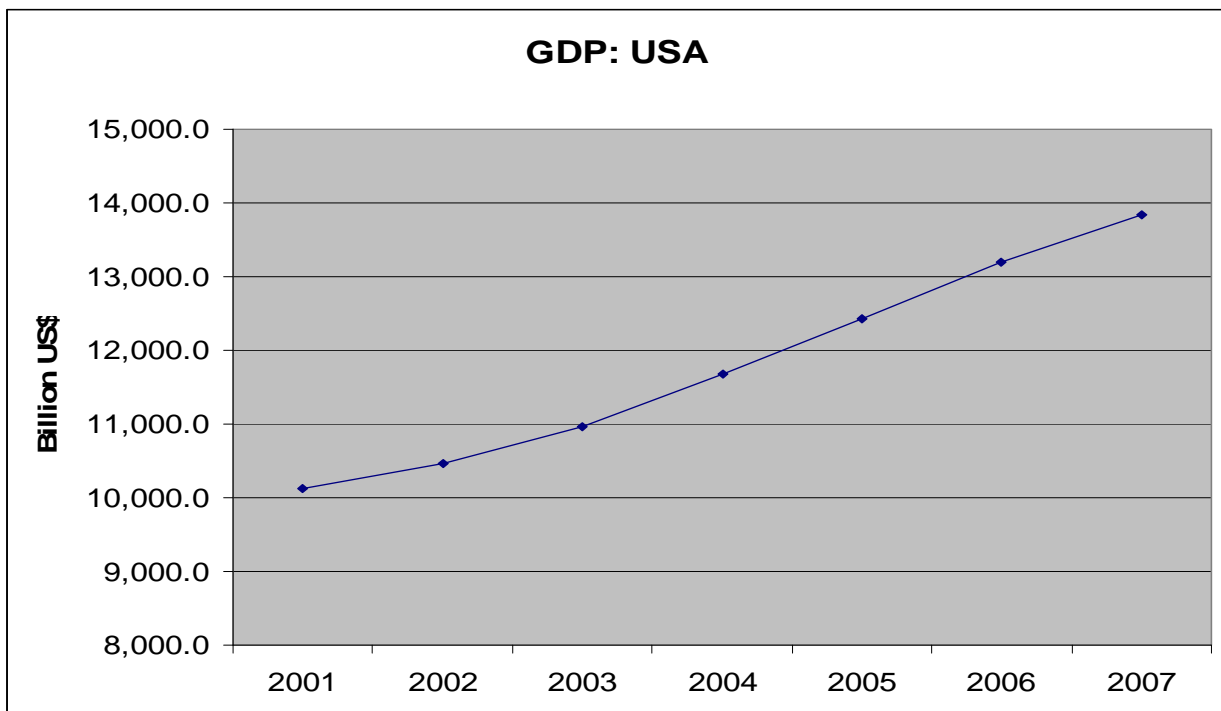
Most of the data is quoted from studies on tropical timber between 2005 and 2008 from ITTO (China, Italy, France and the Iberian Countries) and FAO (U.S.A. and Japan).

The main sources used in this research are studies mentioned above, as well as the Euro-stat internet database site, FAO database and UNECE internet website.

3.1. USA Market

The USA is the major market not only for its huge purchasing capacity but also for its wooden house building culture. Even if in the past years the GDP has shown a low increase (Figure 1.1), and the world financial crisis is affecting the purchasing power; the size of the market and the niches for tropical timber are still interesting.

Figure 1.1



Source: U.S. Bureau of Economic Analysis Survey of Current Business, April 2008

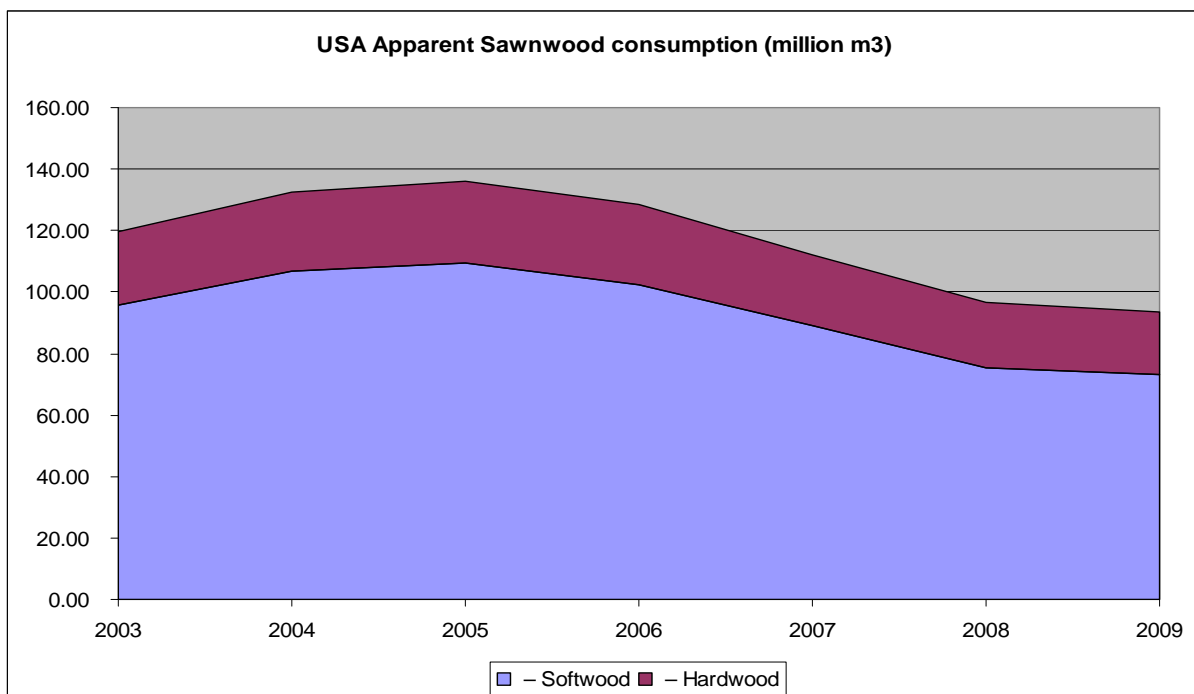
According to the last Report on the USA market, it is possible to say that “The US is the world’s largest producer and consumer of wood products, but represents just 1% of global consumption of tropical wood products. Almost all of what the US imports in tropical wood products is in the form of primary or secondary processed products” (GOETZL A, EKSTROM H, 2006)

Demand in the US market of wood goods is closely linked to the construction sector, where the sector is based on new housing constructions and renovations. “Unlike in many other countries of the world, American housing is typically of wood-frame construction. More than 90% of new homes are constructed using wood framing materials. This applies to both single-

family houses as well as multifamily units of four stories or less” ((GOETZL A, EKSTROM H, 2006).

US Sawnwood apparent consumption (Figure 1.3) in the last years has been decreasing since 2005 when it reached its maximum value; the proportion between softwood and hardwood was 80% to 20% respectively. By the end of 2008 apparent consumption proportion was 77% softwood and 23% of hardwood. Even if total consumption is 31% less than in 2005 (competition materials, crisis, etc) consumption of hardwood has been moving around 20 million m3.

Figure 1.3



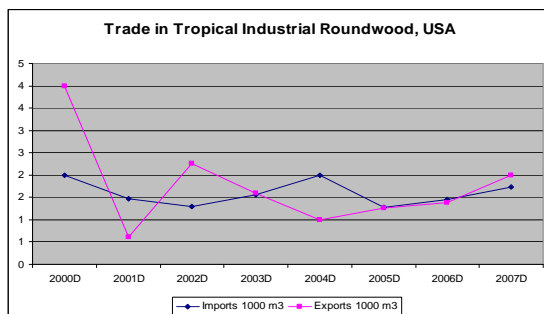
Source: Timber Committee meeting, October 2008.

Regarding tropical timber products markets, “tropical timber species tend to occupy very particular and important niches in the US market. They are used in high-valued market segments such as furniture, cabinets, flooring, architectural woodwork, decking, mouldings and specialized industrial applications, such as in marine uses and truck beds. In some applications, they compete directly with temperate domestic species” (GOETZL A, EKSTROM H, 2006). Industrial roundwood and sawnwood (Figures 1.4 and 1.5), are showing that demand of sawnwood in past years has not suffered deep changes, volume

imported is around 350.000 m³, concerning the tropical industrial roundwood importations trend to move around 2000 m³ in 2007.

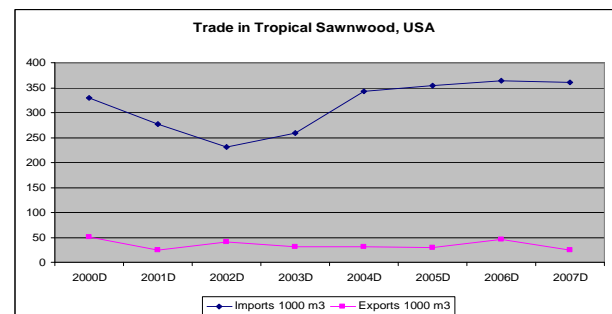
As there is an abundant supply of domestic hardwoods, imported tropical sawnwood is sold mainly for high-end, high-value uses where its properties colour or machining characteristics allow a premium price (GOETZL A, EKSTROM H, 2006).

Figure1.4



Source: United Nations Economic Commission for Europe, UNECE database

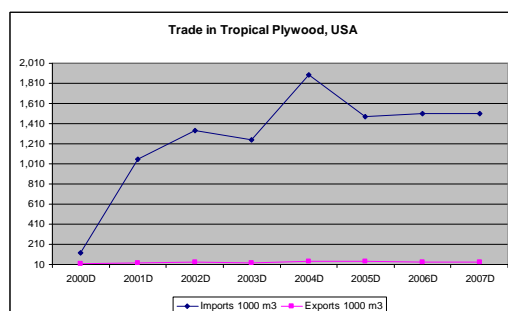
Figure1.5



Source: United Nations Economic Commission for Europe, UNECE database

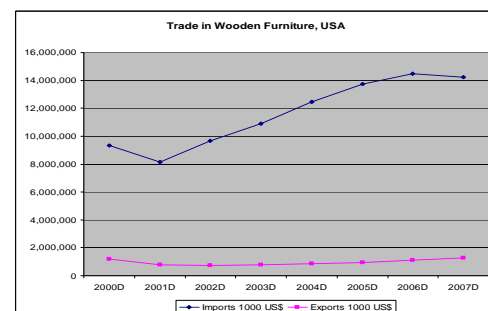
Secondary processed wood products, instead, have had homogeneous movements, as shown on Furniture and Plywood imports (Figure 1.6 and Figure 1.7) segments which have not shown steep movements during the last two years. The flooring niche instead has experienced a fast growth and according to the ITTO study “Some of the fastest growth rates in tropical hardwood imports have been in flooring (figure 1.9). While trade statistics fail to reveal the species mix of hardwood flooring, the majority of these imports was likely in whole or in part manufactured using tropical species.” (GOETZL A, EKSTROM H, 2006)

Figure 1.6



Source: United Nations Economic Commission for Europe, UNECE database

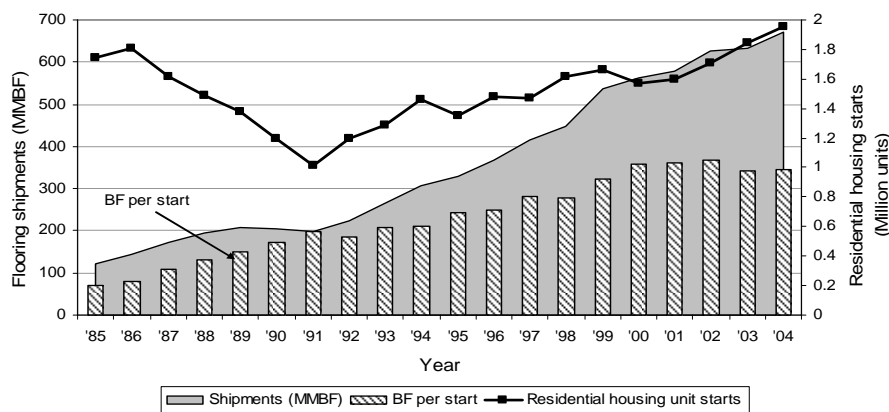
Figure1.7



Source: United Nations Economic Commission for Europe, UNECE database

The wood flooring market has a strong correlation to residential housing starts (Figure 1.2). The use of flooring per start increased from less than 100 BF [0.236 m³] in the mid 80's to approximate 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] (NOFMA 2006). The National Wood Flooring Manufacturers Association attributes this effect to the popularity of wood floors and the continued strength of new constructions and residential remodeling (NOFMA 2006).

Figure 1.2



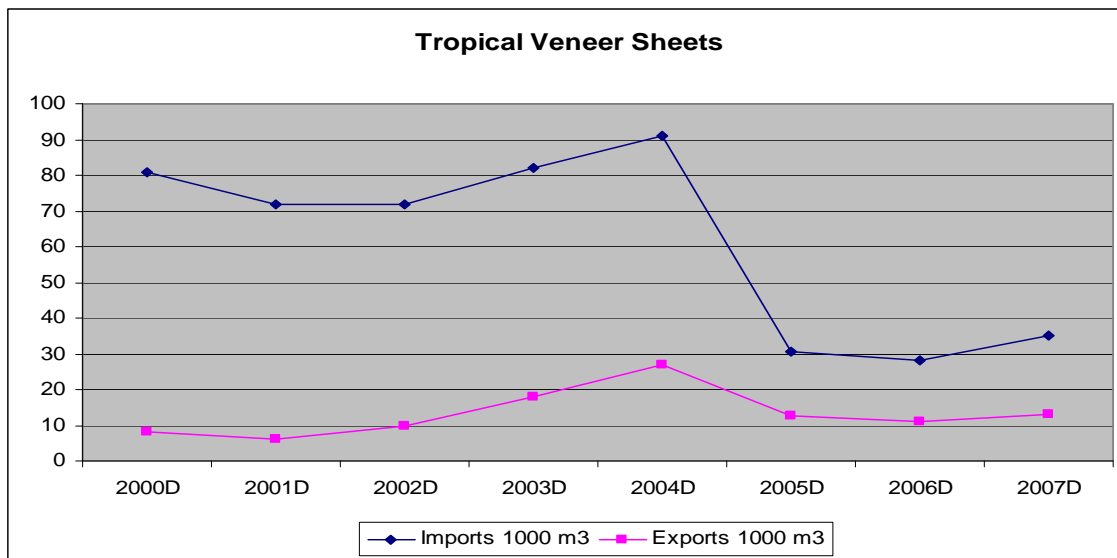
Source: U.S. Flooring Shipments, Residential Housing Units Starts and Board Feet Flooring Used per Housing Start, 1985-2004 (Brindle 2006), cited by Smith and Cossio

According to the market review of Smith and Cossio (2008), “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” the flooring market, as shown in the same report, is divided as follow:

- *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.
- *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.

Concerning Tropical Veneer Sheets (Figure 1.8), since 2005 breakpoint imports have not recuperated previous quotas yet, the volume movement is around 30.000 m³. However the secondary processed wood products (SPWP) are challenging new threats, especially the plywood market; “Regulations on formaldehyde product emissions are emerging as a major issue and may have far-reaching implications for the US wood panel market.” (GOETZL A, EKSTROM H, 2006). From this year the State of California has established strict limitations on Formaldehyde emissions from wood products; impacting the future trade deeply.

Figure 1.8



Source: United Nations Economic Commission for Europe, UNECE database

Remarkable reductions in emissions levels of urea formaldehyde are requested by California Air Resources Board (CARB) for MDF's and hardwood plywood. CARB's rules set different standards for each different type of board and phases of application as shown in the table 1.1

Relating to main competition for tropical woods in end-use, the review of MDF and wood based panels (WBP) is moving as follows: the WBP market has decreased in the period 2006-2007; even though the imports have decreased the national production and exportation have remained at the same levels (Figure 1.9).

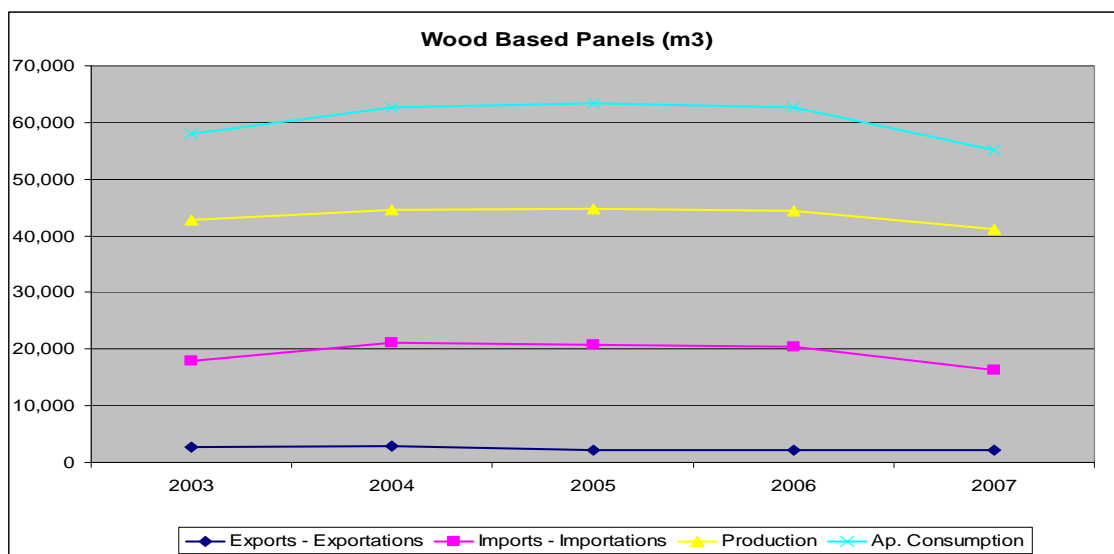
Table 1.1

Phase 1 and Phase 2 Formaldehyde Emission Standards for Hardwood Plywood (HWPW), Particleboard (PB), and Medium Density Fiberboard (MDF) ¹					
Effective Date	---- Phase 1 (P1) and Phase 2 (P2) Emission Standards (ppm) ----				
	HWPW-VC	HWPW-CC	PB	MDF	Thin MDF
1-1-2009	P1: 0.08	-----	P1: 0.18	P1: 0.21	P1: 0.21
7-1-2009	-----	P1: 0.08	-----	-----	
1-1-2010	P2: 0.05	-----	-----	-----	-----
1-1-2011	-----	-----	P2: 0.09	P2: 0.11	-----
1-1-2012	-----	-----	-----	-----	P2: 0.13
7-1-2012	-----	P2: 0.05	-----	-----	

(¹) Based on the primary test method [ASTM E 1333-96(2002)] in parts per million (ppm).
HWPW-VC = veneer core; HWPW-CC = composite core.

Source: Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products

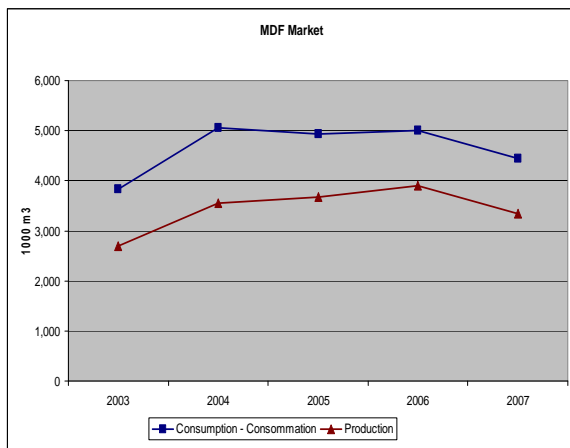
Figure 1.9



Source: United Nations Economic Commission for Europe, UNECE database

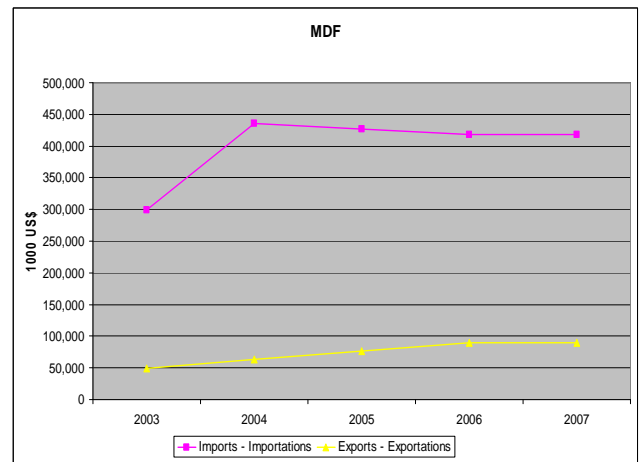
Regarding the MDF market, the US (Figure 1.10 and 1.11) is one of the main importers; trade during 2007 shows a US\$ 328 billions difference between imports and exports and consumption moving around 4.5 million m³. Until now it has been unpredictable how the economic crisis is affecting the situation because data is not yet available but the trend is to decrease consumption levels.

Figure 1.10



Source: United Nations Economic Commission for Europe, UNECE database

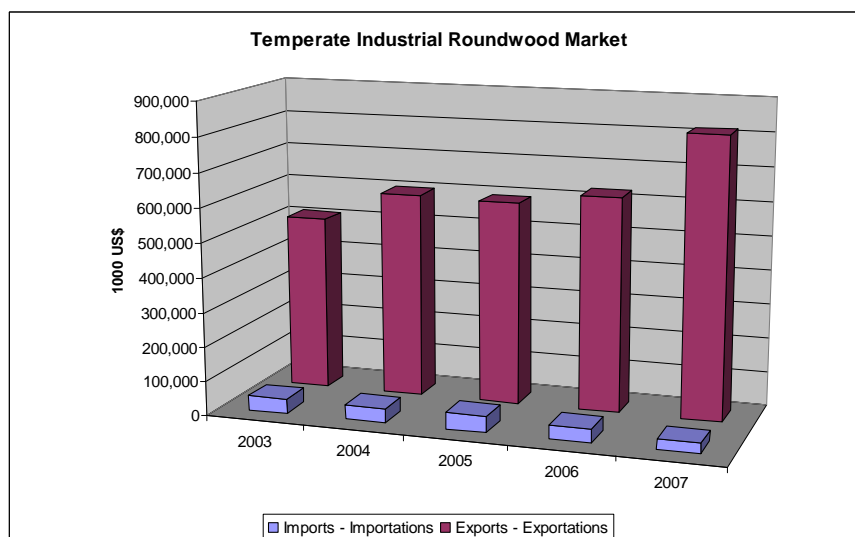
Figure 1.11



Source: United Nations Economic Commission for Europe, UNECE database

Concerning temperate Industrial roundwood (Figure 1.12) movement, during 2007, there has been a notorious increase compared to precedent years; which explicits high movement in this sector.

Figure 1.12

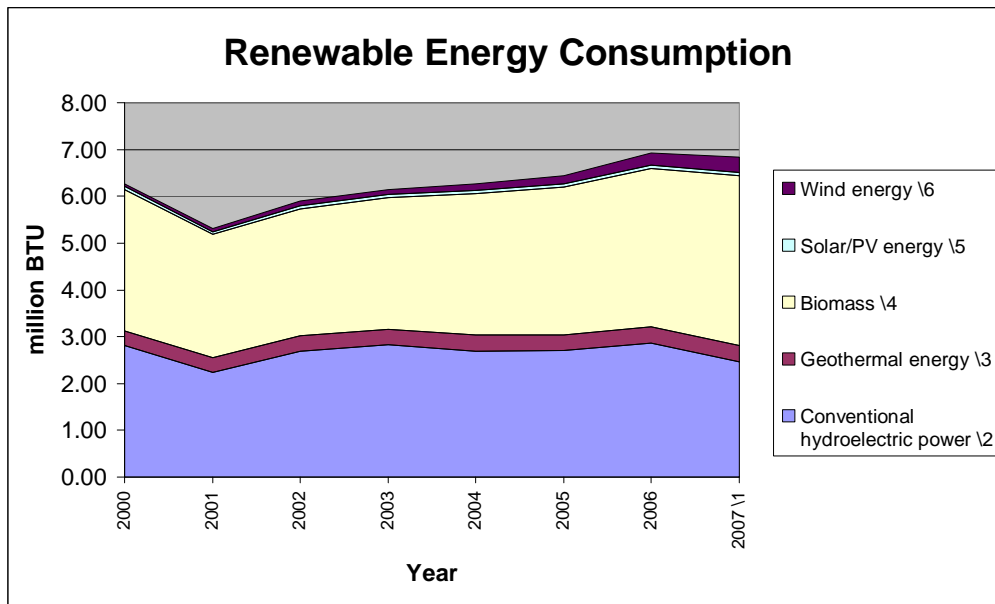


Source: United Nations Economic Commission for Europe, UNECE database

A particular niche to pay attention to is the one related to energy, especially biomass, (where the share of pellets, charcoal, etc from tropical woods is not specified) nevertheless, it seems like the trend in fuelwood is to import them from cheaper sources (Figure 1.14). Even if the

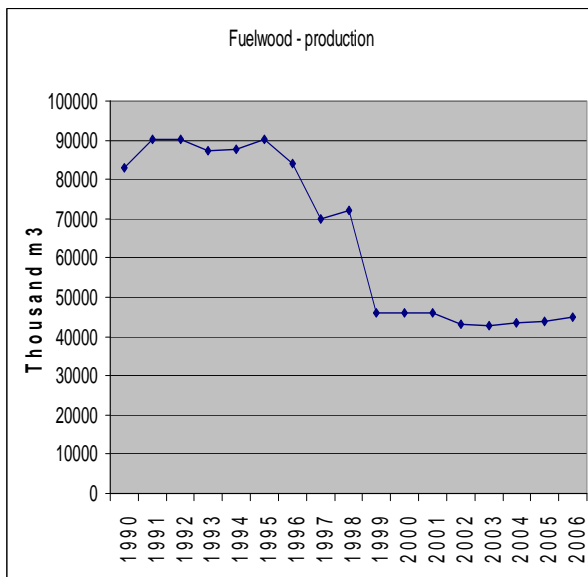
US market is hardly linked to conventional energy, demand of renewable energy is getting higher each passing year. As seen in figure 1.14.

Figure 1.13



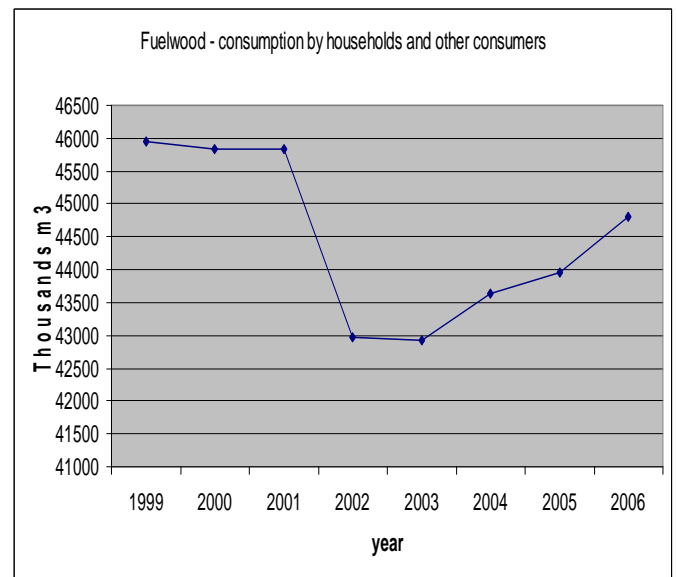
Source: U.S. Energy Information Administration, Annual Energy Review, annual.

Figure 1.14



Source: United Nations Statistics Division – UNSD

Figure 1.15



Source: United Nations Statistics Division – UNSD

Summarizing market's trends in Tropical Timber Products:

Tropical Wood							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Flooring	Trends of Competition (MDF, WBP, Temperate woods)
Imports	Saw tooth profile	Flat	High '00-'06, Flat since then	decreasing	up	Fast growth	Flat
Exports	Low	Flat	low	Flat	low	low	Flat

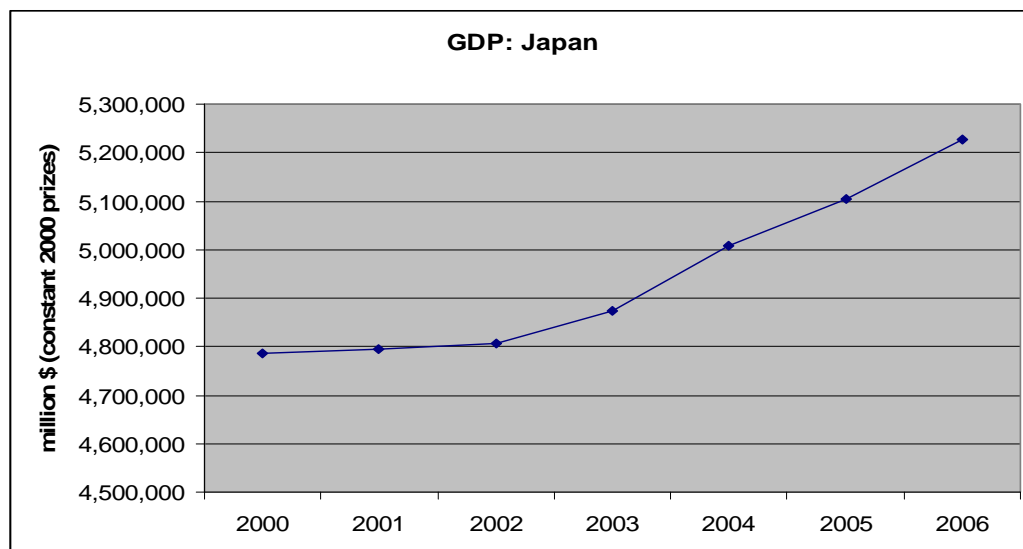
Regarding threats, a major one is the new formaldehyde emissions standard to be achieved by producers and exporters. The Biomass niche seems to have an interesting future.

The Financial crisis is a key aspect to the house building demand and there are some issues to take into consideration such as the GDP in 2008 decreased by 3.8% in which housing directly contributed 0.85%. Production cut backs and consumption declines in nearly every segment of the U.S. wood products industry: Softwood lumber demand down by 50% since 2005; Hardwood lumber down by 35%; Structural panels down by 37% since 2005; and engineered wood products (EWP) down by 30%. However the U.S. industry can position itself to take advantage of the coming economic stimulus, such as green energy investments (Taylor R. COFO 2009)

3.2. Japanese Market

The Japanese GDP (Figure 2.1) indicates a constant increase since 2000 until 2006; even with effects of the global crisis the GDP is enormous; therefore the importance of the Japanese market, particularly the wood market.

Figure 2.1



Source: United Nations Statistics Division – UNSD

Demand of wooden goods in Japan's market has changed in relation to the historic period of time, from traditional wooden houses, post war reconstruction to actual new houses construction. The share of wooden houses in newer constructions is approximately 45% (table 2.1).

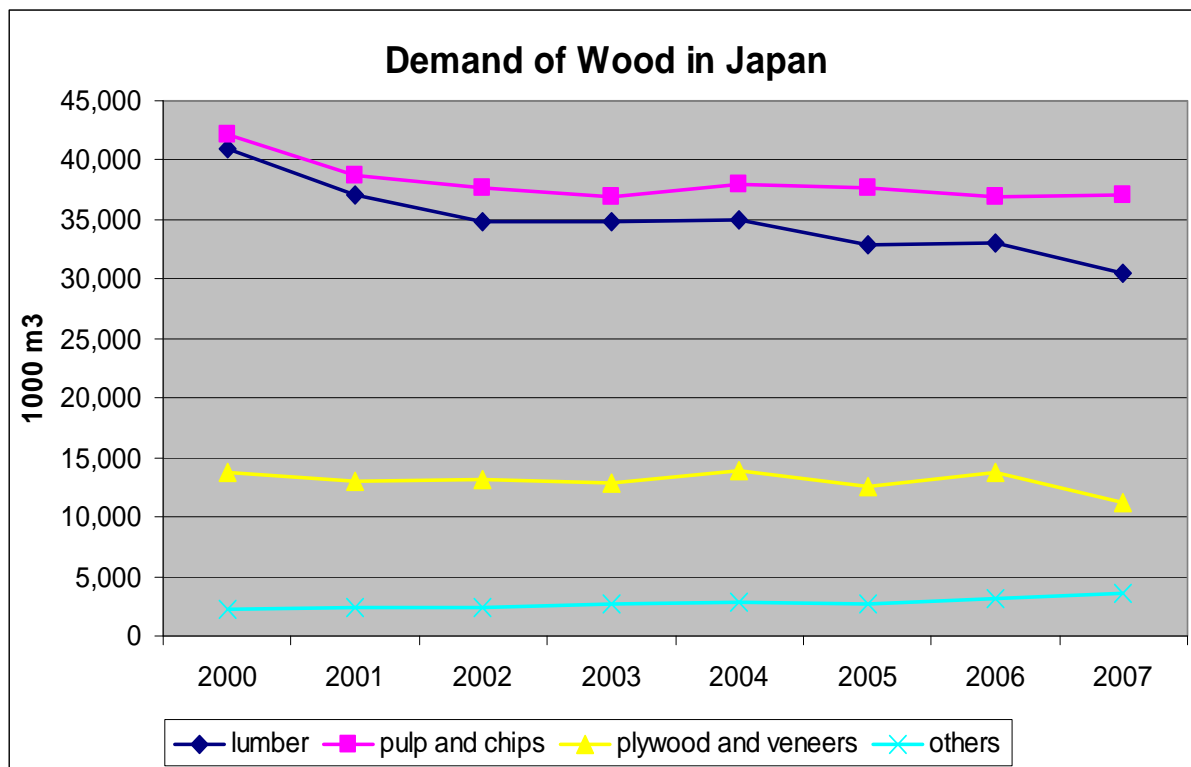
Table 2.1
Housing starts and share of wooden houses
(1,000 units)

	starts	wooden houses %
2000	1,229,843	45
2001	1,173,858	45
2002	1,151,016	44
2003	1,160,083	45
2004	1,189,049	46
2005	1,236,175	44
2006	1,290,391	43
2007	1,060,741	48

Source: Japanese Ministry of Land, Infrastructure and Transportation

Total demand of wood in Japan is decreasing at an average rate of 2% per year, since 2000. The accumulate percentage reaches 17%; main constrain seem to be in lumber and pulps and chips sectors (Figure 2.2).

Figure 2.2



Source: Japanese Forestry Agency

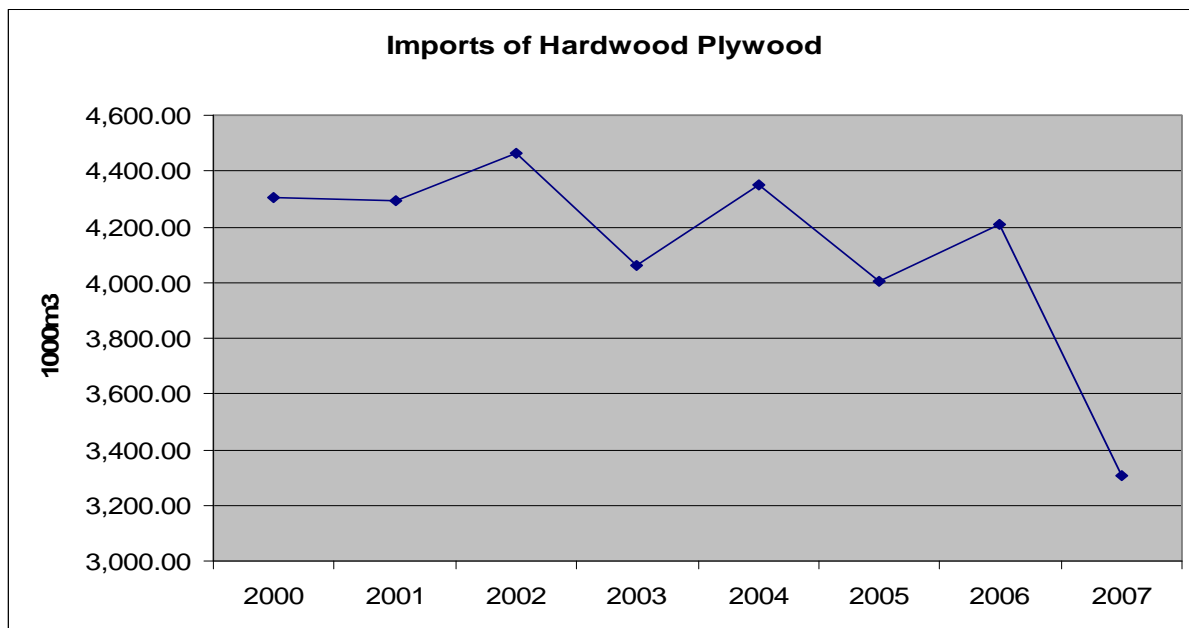
Currently high technology and high skilled human resources have developed a high value-added specialized industry; and concerning tropical woods, imports are dedicated to tropical plywood and lumber.

Imports of hardwood Plywood doesn't seem encouraging (Figure 2.3&Figure 2.4) not only for the market constraining but also because use of domestic wood for plywood is expected to increase.

As described by Araya and Katsuhia (FAO 2008) "In the early 1990's, facing a shrinking supply and future insecurity of tropical wood, the Japanese plywood manufactures started the shift from tropical hardwood to softwood. The total domestic plywood production volume has

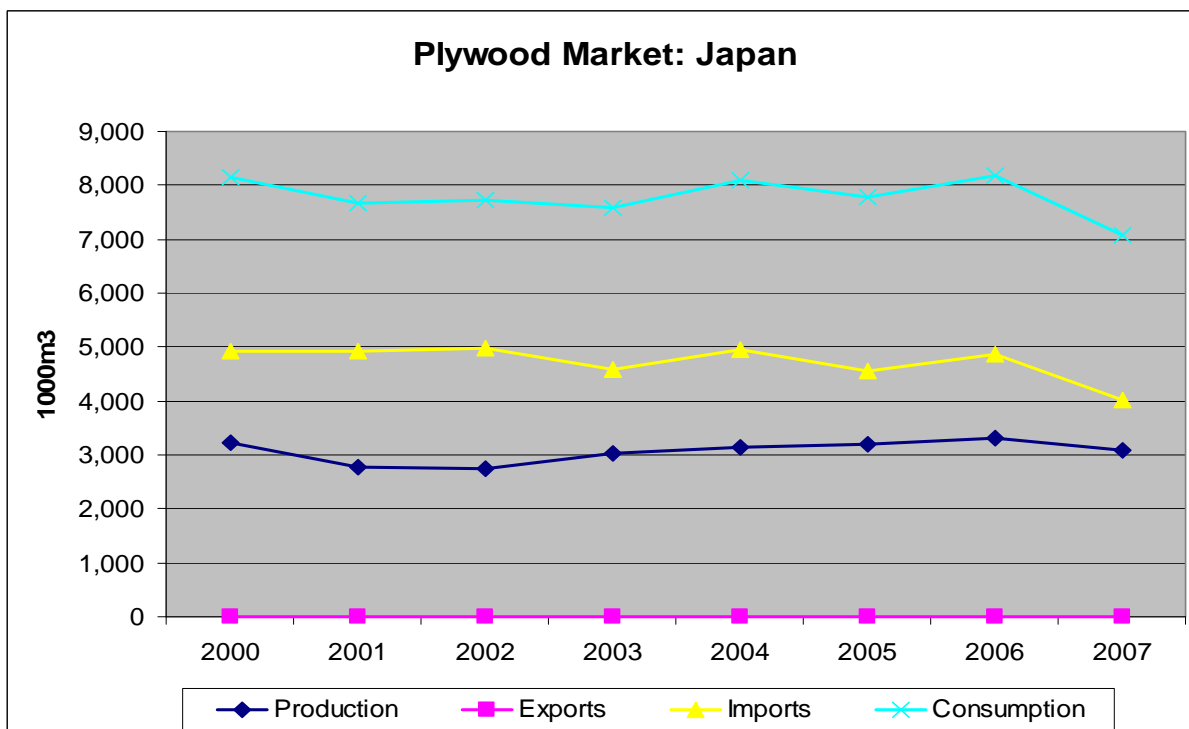
been on the decline but the share of softwood plywood rose rapidly. In 2007, production of softwood plywood accounted for 79% of the total.”

Figure 2.3



Source: Japan Ministry of Finance, “Trade Statistics”

Figure 2.4



Source: Japanese Ministry of Finance, “Trade Statistics”, Ministry of Agriculture, Forestry & Fisheries

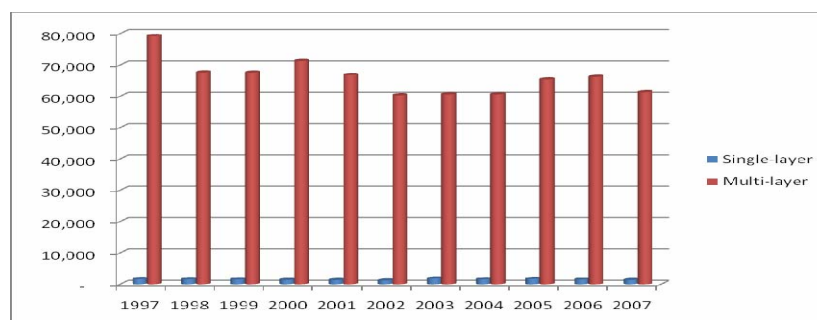
The Japanese rate of self-sufficiency is growing quickly considering volumes demanded a 1% increase each passing year is expected not only for plywood but for the entire sector's major imports replacements.

Relating to VOC (Volatile Organic Compound like formaldehyde, toluene, xylene, wood preservatives, plasticizer, and termite repellents) which are released from adhesives, paints and anti-corrosives contained in building materials and furniture, the Ministry of Construction produced "Design and Construction Guidelines" and a "Users' manual" and included clean indoor air quality as one of the required performances under the Housing Quality Assurance Law (Araya and Katsuhia, FAO 2008).

Permissible levels of indoor formaldehyde concentration are divided as follows: Fc0, Fc1 and Fc2. The least emission products were given 4 stars (F4****) and their interior uses were allowed with no limitations. Interior uses of F3 and F2 products were limited depending on frequency of ventilation. F1 products were not to be used on interiors. New regulations on formaldehyde emissions in the Building Code were enacted in 2003. The JAS also followed by specifying low emission standards.

Regarding flooring (figure 2.5) available info indicates that the Japanese market can be divided into two categories: single layer flooring and multi-layer flooring. The first one using as raw material hardwood and used by public facilities; the second one is made of base material (ARAYA A, KATSUHIA H, FAO 2008) (almost exclusively imported tropical plywood) and inner layers of laminated wood, particleboard, MDF and a surface material (usually a veneer of various hardwood species). Multi-layer flooring demand is affected by housing starts.

Figure2.5

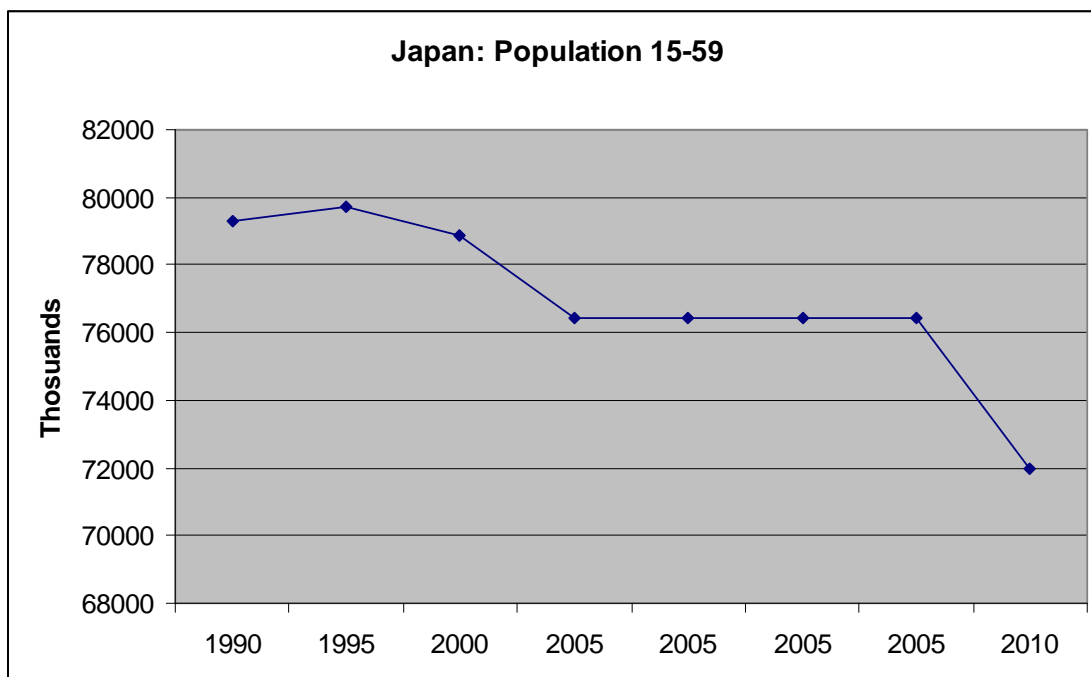


Source: Multi-layer Flooring Manufacturers' Association

Considering Araya and Katsuhia (FAO 2008) report it is important to mention forces of change in the Japanese tropical wood market:

- (1) Quality and safety of houses
- (2) Concerns for health (VOC)
- (3) Building Code, regarding materials
- (4) Demographics (elderly population)
- (5) Consumers' preference
- (6) Concerns for environment
- (7) Green purchasing
- (8) Policies of exporting countries
- (9) Exchange rates (Strength of Japanese yen affects considerably the price competitiveness of imported wood)

Figure 2.6



Source: United Nations Statistics Division – UNSD

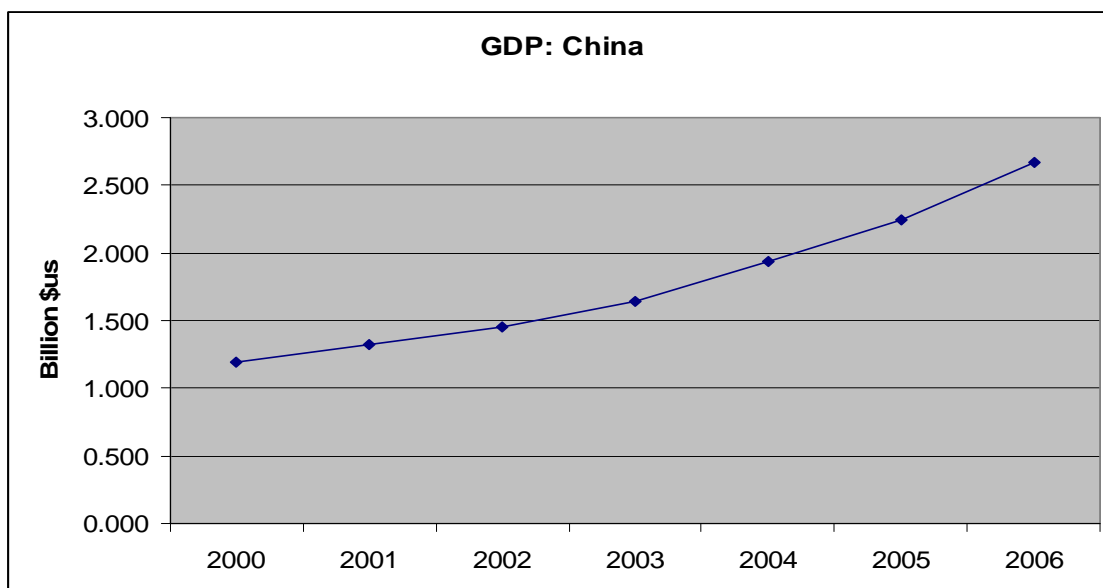
Tropical Wood: Japan							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	---	marginal	decreasing	decreasing	-----	---	---
Exports	---	---	decreasing	decreasing	----	----	---

3.3. Chinese Market

Presently China accounts for a large part of the growth in trade; according to FAO, its total wood products imports rose from US\$5.4 billion in 1990 to US\$20.6 billion in 2006 and the demand for wood products will continue to rise in line with the growth of population and income. Following data consider China as a tropical wood importer

The GDP has risen almost 3 times since 2000 (Figure 6.1). Socioeconomic factors, (“the reduction in the proportion of working-age adults, due to a strict population policy”) and population changes, (“expected population to have grown by 230 million and its rural population to have decreased by 122 million in 2020”) are affecting considerably the wood products demand. (FAO 2009)

Figure 6.1



Source: United Nations Statistics Division – UNSD

Since the opening of Chinese Economy, the timber distribution system has completely changed allowing fluent national and international commerce. It changed from planned purchase and sale to an actual open economy where many private companies and individuals are involved. “As the economy in China becomes more of a market economy the timber sector has grown and there are now many manufacturers who buy and sell directly to consumers at home and abroad” (ITTO2007)

Due to China's scarce self-sufficiency rate, imports of wood products are expected to increase; "China has inadequate forest resources to sustain the present wood industries and is especially deficient in high value, large diameter hardwoods and this situation cannot be solved through efforts at self-sufficiency in a short period of time." (ITTO 2007)

Therefore, China will still be an import dependant on raw materials (such as logs, sawnwood, paper pulp and waste paper). On the topic of consumption, as described by the ITTO 2007 technical report, China will continue to be a huge potential market for tropical timber but the main factor affecting China's tropical timber consumption is not demand but the supply capacity in the international market.

Regarding the market segmentation, as illustrated on the ITTO report, the market is divided as follows:

Primary Wholesale market: These are markets in or close to the production areas or ports of entry. These markets are concentration points and handle mainly logs. Close to China's main ports of entry for tropical logs primary wholesale markets have been established.

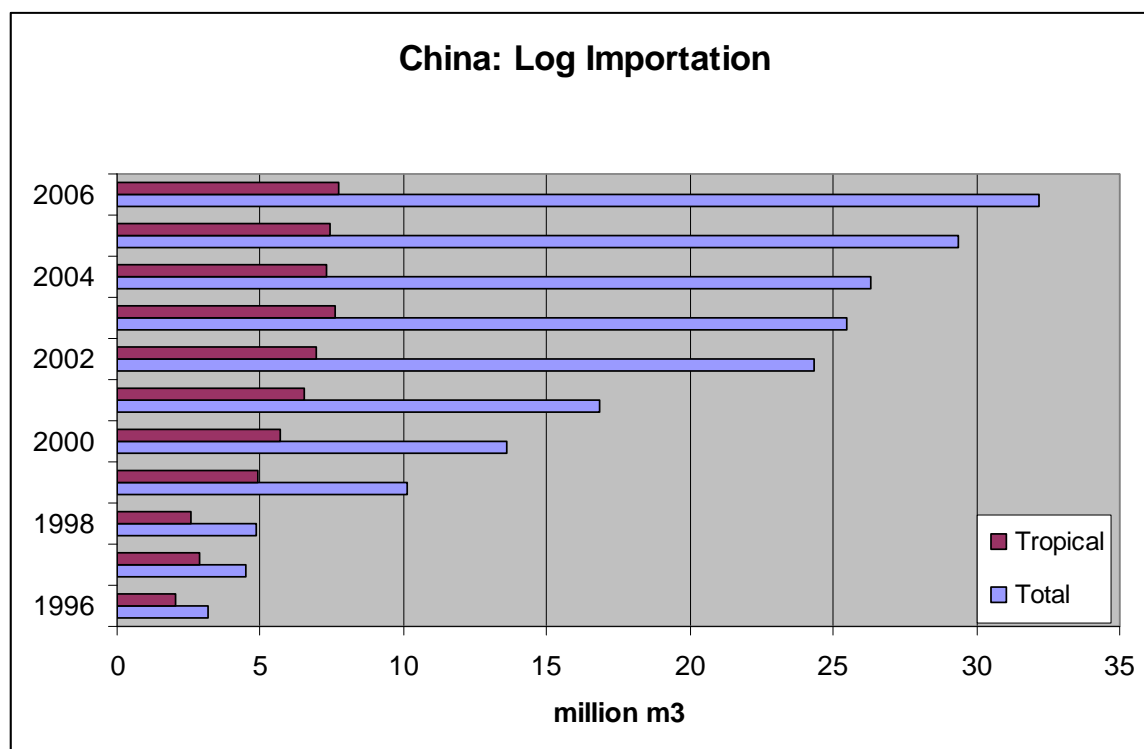
Secondary wholesale Market: These are markets located in geographically strategic points of collection or transport hubs often in the centre of a producing area and close or convenient for consuming areas. These markets are usually located in provincial capital cities or transport hubs where it is convenient to store and redistribute wood products.

Tertiary retail market: This type of market is the retail wood market and is commonly located in an area served by a secondary wholesale market or it may be located in an area with a large population or where there is a concentration of wood product manufacturers. There are three kinds of retail wood markets: the individual stall type market, the single company monopolistic timber store and the timber supermarket which is more common in the big cities in China

Regarding logs imports (Figure 6.2), since 1996 the proportion of tropical logs compared to total log importations has decreased from 64% to 24% in 2006. However volumes imported in 2006 reached 5 million m³ more than in 1996 with an increasing trend since 1996.

According to ITTO, tropical log imports have fallen due to: Implementation of Natural Forest Protection Program in 1998, output of large diameter quality log was cut and large amounts of logs from Russia were imported. Main suppliers to China's markets are Gabon, Malaysia, Myanmar and Papua New Guinea.

Figure 6.2

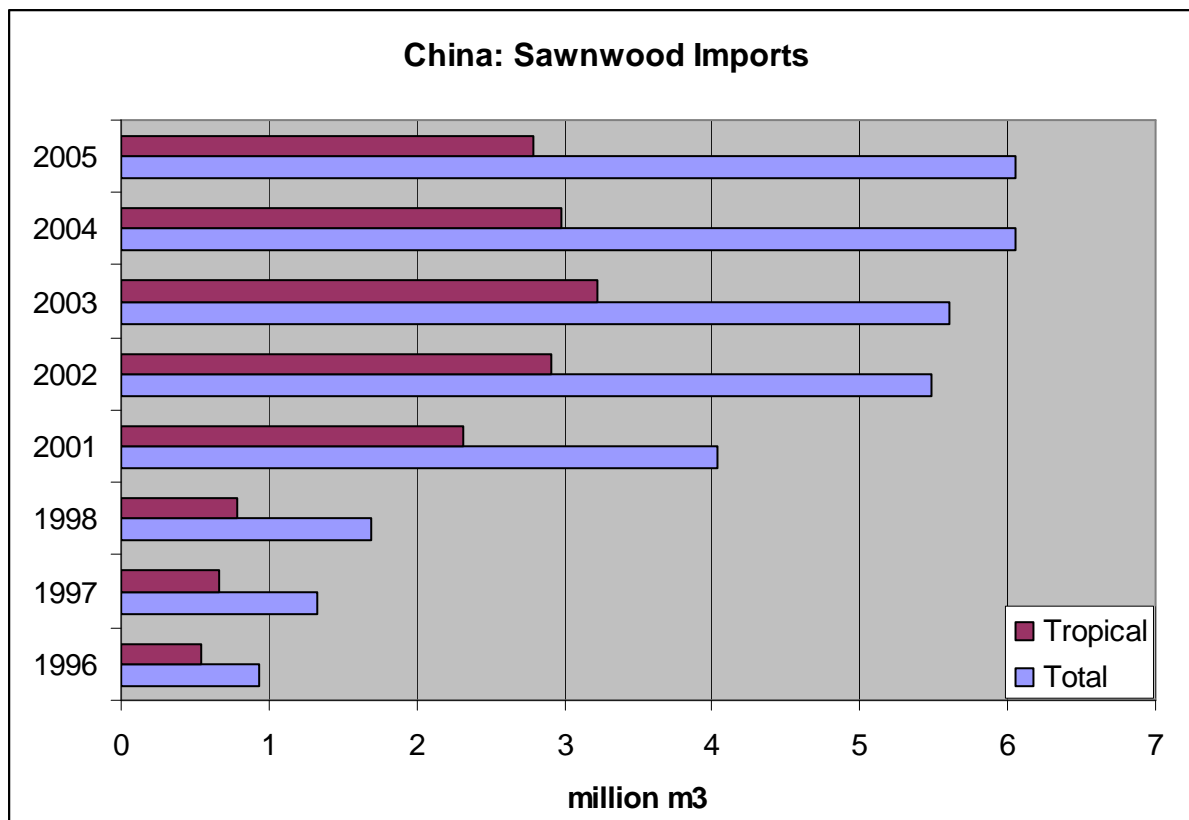


Source: ITTO Technical Report 2007

Relating the tropical sawnwood imports (Figure 6.3), in the period 1996-2006, China's sawn timber imports increased significantly from 0.54 million m³ in 1996 to 2.79 million m³ in 2006; however the rate of increase was small compared to the rate of increase in log imports. Although volumes imported of tropical sawnwood have risen, the percentage has decreased 10 points since 2003. According to the ITTO 2007 report since 2002 the volume of sawn timber imports started to fluctuate and the rate of increase in imports began to slow.

Main suppliers to Chinese markets are Malaysia, Indonesia, Thailand, Myanmar and Brazil. Most of the imported tropical sawnwood species are used to produce most of the solid wooden flooring

Figure 6.3

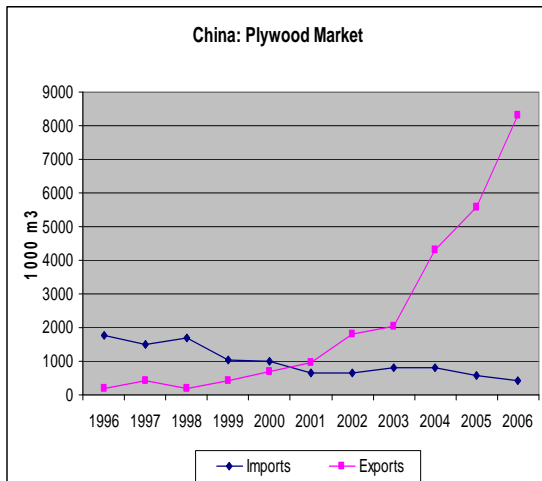


Source: ITTO Technical Report 2007

Regarding the plywood market, it is important to notice that actual China's level of plywood production makes the country the number one world producer; due to a strong domestic market demand, domestically grown core material available, cost and quality create strong international demand and start-up capital requirements are relatively low (ITTO 2007).

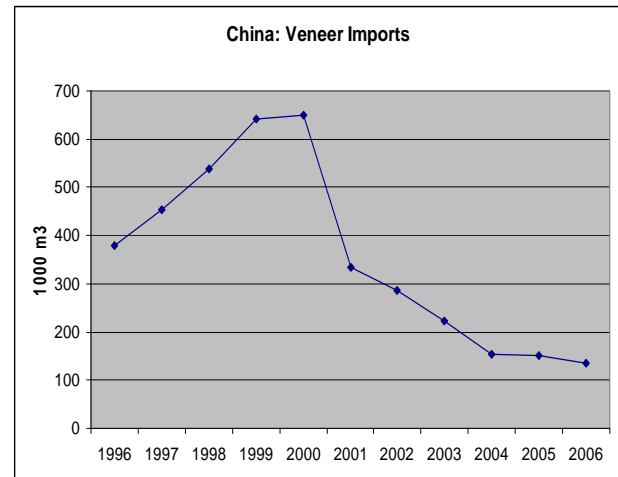
Exports have had a sharp increase since 1996 from almost nothing to 8 million m3 in 2006; as a consequence the decreasing trend for tropical plywood and veneers (Figures 6.4 & Figure 6.5) is predictable. "Although China's plywood imports have been declining the types of plywood imported and the sources have not changed very much. Imported plywood is still mainly of tropical plywood, and the principal source countries have been Indonesia and Malaysia. (ITTO 2007)

Figure 6.4



Source: ITTO Technical Report 2007

Figure 6.5



Source: ITTO Technical Report 2007

The wooden furniture and flooring market seem to have the same future as the plywood market; both of them have been replaced by WBP, MDF and temperate wood and high level of local production.

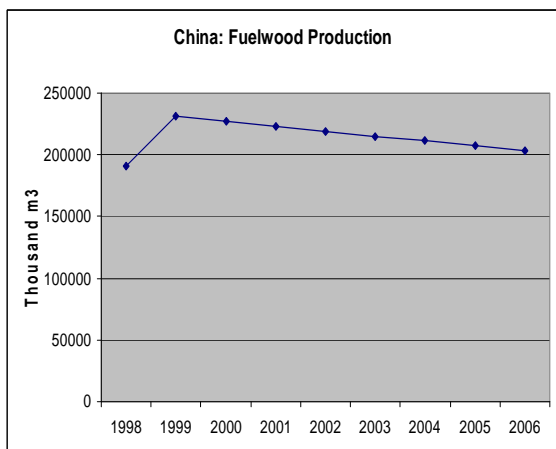
The description by the ITTO paper regarding wooden furniture indicates: “Solid wooden furniture is now a small component of the total market and the proportion of solid wooden furniture will continue to decline. Most of the market for furniture has been captured by wood-based-panel furniture and wood-based panel and solid wood combined furniture”. Common imported furniture items include: kitchen furniture, wooden framed seats, wooden bedroom furniture, office furniture and a category recorded as other wooden furniture

Wooden flooring instead, is categorized as solid wooden flooring (veneer is used as the raw material), solid composite (fibreboard is used as the core material) flooring, intensified flooring and bamboo/wood composite flooring (uses bamboo as the main raw material) and they foresee a continuing decline in the proportion of solid wooden flooring being produced (ITTO 2007).

In the energy sector, fuelwood (where the share of pellets, charcoal, etc from tropical woods is not specified) import levels have risen since 2000. The increase between 2005 and 2006 was from circa 7 thousand m³ to 18 thousand m³ in 2006 (Figure 6.8); however imports are

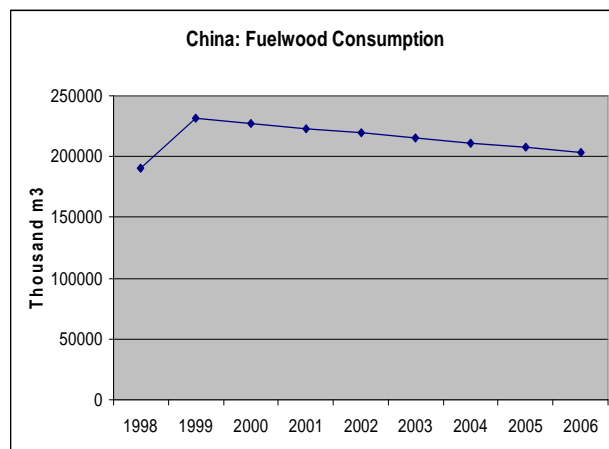
insignificant compared to production levels, which reached 200 million m³ in 2006 (Figure 6.6).

Figure 6.6



Source: United Nations Statistics Division – UNSD

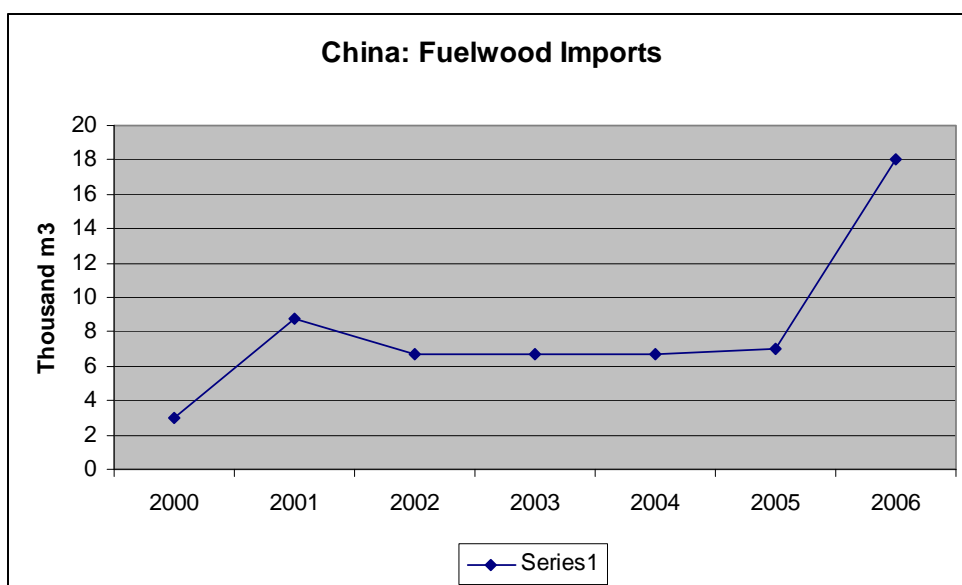
Figure 6.7



Source: United Nations Statistics Division – UNSD

Fuelwood Consumption (Figure 6.7) is as high as production but both are facing decreasing trends since 1999 due to a lower rural population. However, it is important to pay attention to the market movement in order to open a new niche.

Figure 6.8



Source: United Nations Statistics Division – UNSD

Summarizing market's trends in Tropical Timber Products:

Tropical Wood: China							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	Flat	increasing	Flat, low	flat, low	Low	low increase	increasing
Exports	low	low	increasing	increasing	up	----	increasing

3.4. Italian Market

Italian macroeconomic data, considering the GDP, exposes that even if it has been rising (figure 3.1) in comparison with Euro-area economies it has been lagging behind. The annual change of the Italian real GDP has been a little lower than the average annual change of the Euro-area GDP (table 3.1).

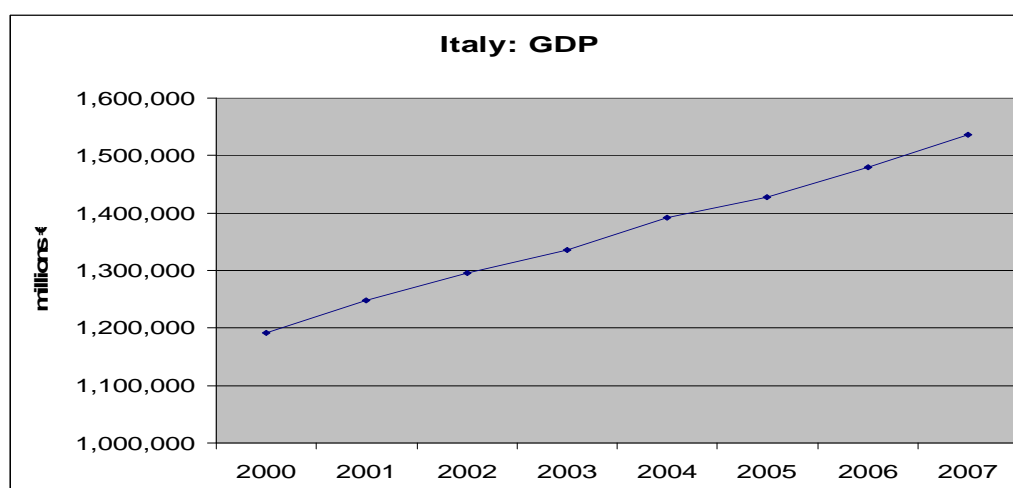
Table 3.1

	1980-1990	1991-2000	2001-2004	2005-2006 ¹⁾
Italy	2.3 %	1.6 %	1.0 %	1.9 %
OECD – Euro-area	2.4 %	2.1 %	1.3 %	2.2 %

¹⁾ Forecast

Source: OECD

Figure 3.1

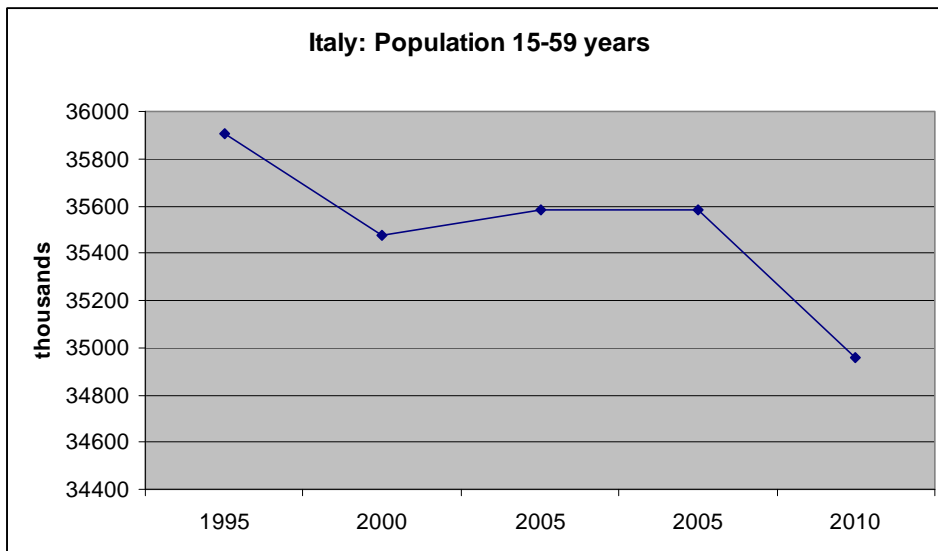


Source: Eurostat

As less active economic population is expected (Figure 3.2), ageing population is becoming a problem. Purchasing power becomes weaker and as a consequence; taxes to the government by young persons decrease, pension rates increase progressively and public spending constrains affecting the entire economy.

This structural weakness of the Italian economy is reducing the purchasing power of many households and leads to lower domestic demand and consumer confidence, in general (OECD, 2005).

Figure 3.2



Source: United Nations Statistics Division – UNSD

Considering the fact that Italy has a limited raw material source, they “utilize its production capacity by importing the raw material to its industry and produce value added products for its trading partners” (ITTO 2005). Italy as a net importer of raw material is specialized in high value added wood products such as furniture, panels, etc.

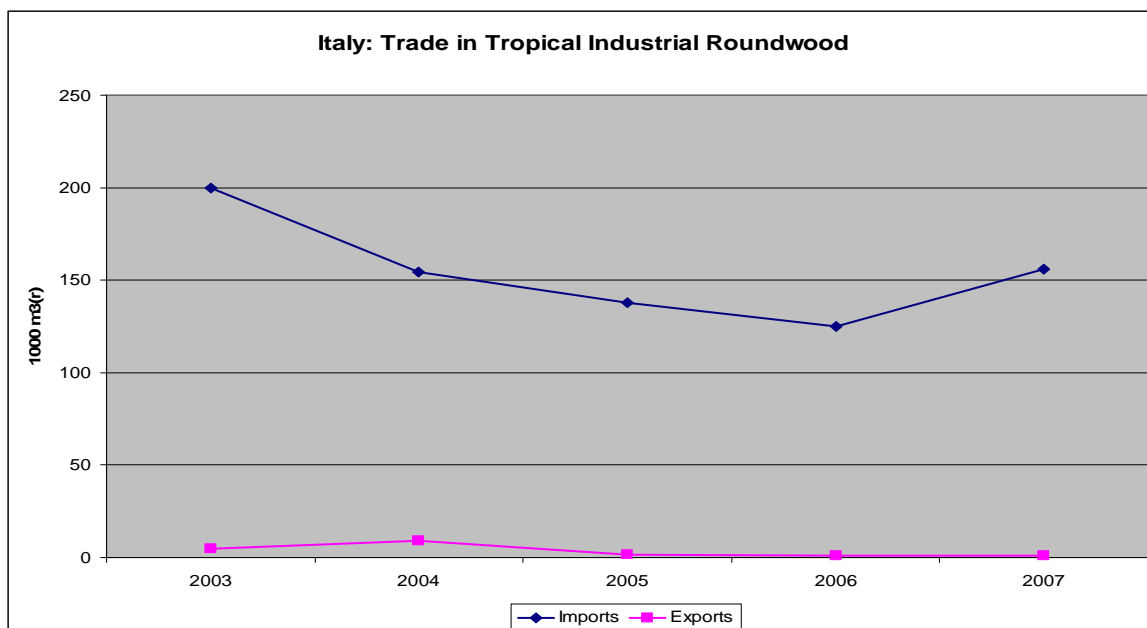
Relating to the trade of wood products the structure, explained by Baudin, Flinkman and Nordvall report (ITTO 2005), “Typically, traders in wood and wood products purchase dominating share of their products from abroad through exporters/ importers/ agents and/or directly from producers abroad.” and “Further supply to clients along the wood value chain occurs through a network of wholesalers and retailers to consumers”. In general, transactions are based on personal contacts between buyers and sellers”.

Italian housing sector, as the most important niche for tropical woods, is divided in four parts:

- (i) residential construction,
- (ii) non-residential construction,
- (iii) civil engineering and
- (iv) other construction (including do-it-yourself –DIY and services)

Trade in tropical industrial roundwood (Figure 3.3) in 2006 counted for circa 125 thousands m³r, in 2007 imports counted for 150 thousands m³r (16% more than last year); compared to other market niches, traded volume is not high. However there is an increasing trend and main sources of tropical industrial roundwood imports are completely dominated by Africa (ITTO2005). Meanwhile exports remain marginal.

Figure 3.3

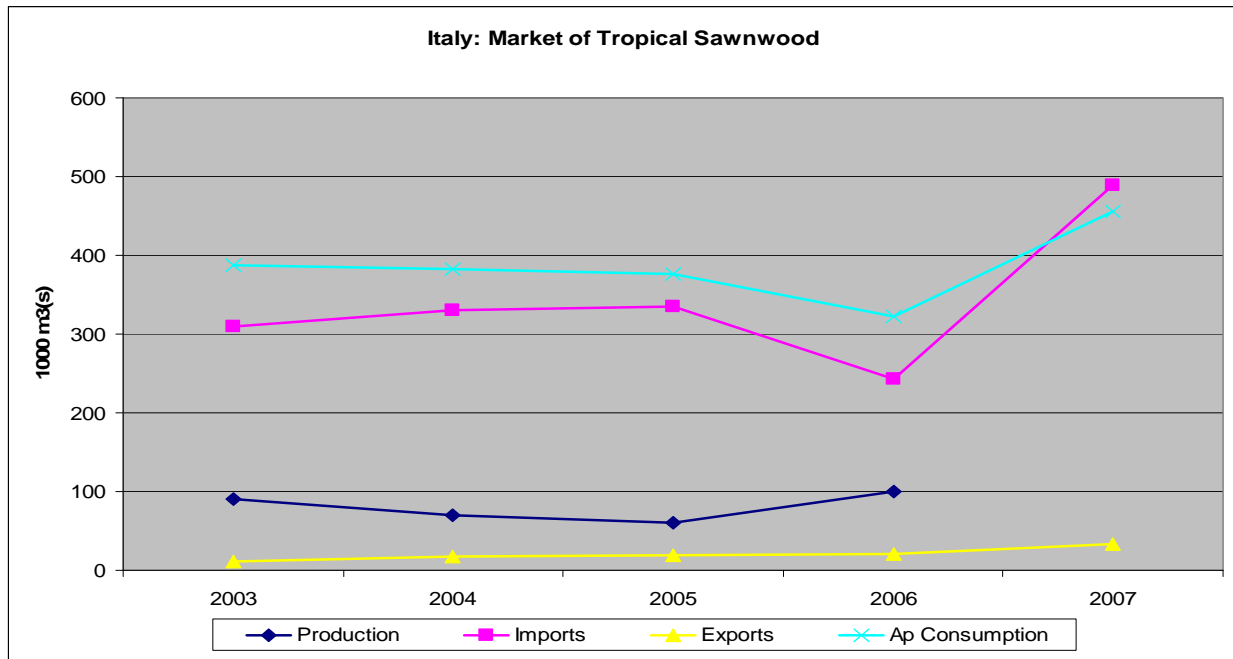


Source: United Nations Economic Commission for Europe, UNECE database

Regarding tropical sawnwood market, imports between 2006 and 2007 have increased from 250 thousands m³ to almost 500 thousands m³. Tropical sawnwood suppliers “originate to an extensive degree from Africa” (ITTO 2005). Also Central and South America tend to increase its market shares but from a low level.

Exports and production have marginal volumes (Figure 3.4) and both of them are traded in Russia and the EU area. Consumption has increased in the period '06-'07 and almost 95 % is satisfied by imported wood.

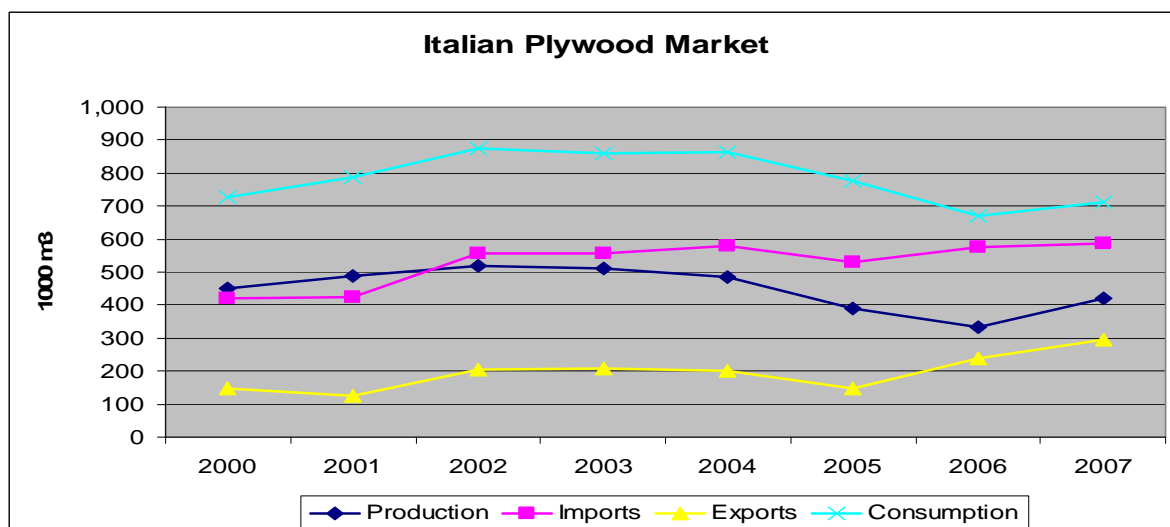
Figure 3.4



Source: United Nations Economic Commission for Europe, UNECE database

Plywood consumption (Figure 3.5) instead has been decreasing since 2004; however imports still remain around 600 thousands m³ per year. As a consequence, since 2005 exports have increased and production is following a saw tooth profile. In terms of imports, major suppliers are Africa, as the major one, Asia and Central and South America gaining market places (ITTO 2005).

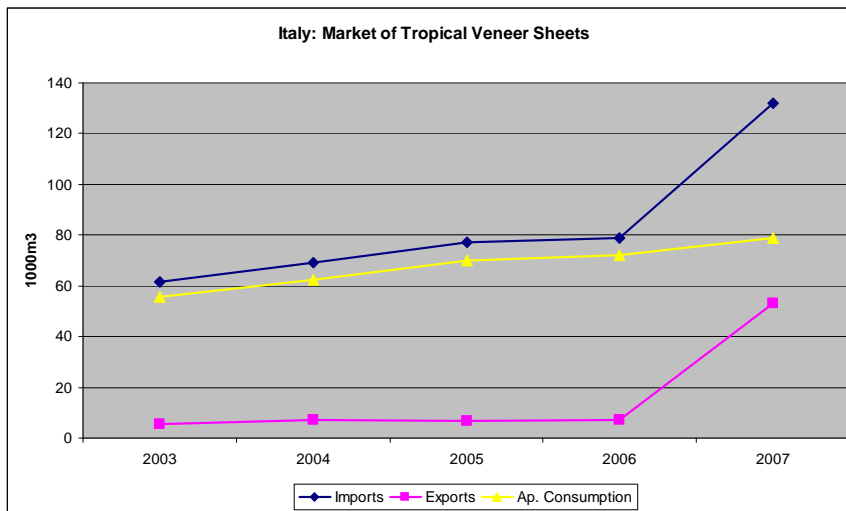
Figure 3.5



Source: United Nations Economic Commission for Europe, UNECE database

Regarding trade in tropical veneer, trends show a fast grow importation since 2006; from 80 thousands m³ to nearly 140 thousands m³, an increased percentage of 40% since 2006 and 55% since 2003. Consumption has increased 25% in the same period and exportation around 80% between 06'-07' (Figure 3.6). Main markets for Italian exports are the USA and China, followed by the EU area, and supply is completely dominated by African countries (ITTO 2005).

Figure 3.6



Source: United Nations Economic Commission for Europe, UNECE database

There is no specific information regarding furniture of tropical wood; then for Italy, which is a high value added products manufacturer, exports of wooden furniture (Figure 3.7) sector since 2004 has been almost unmovable and gaps with imports circa 5000 millions US\$. Italy is a net wooden furniture exporter.

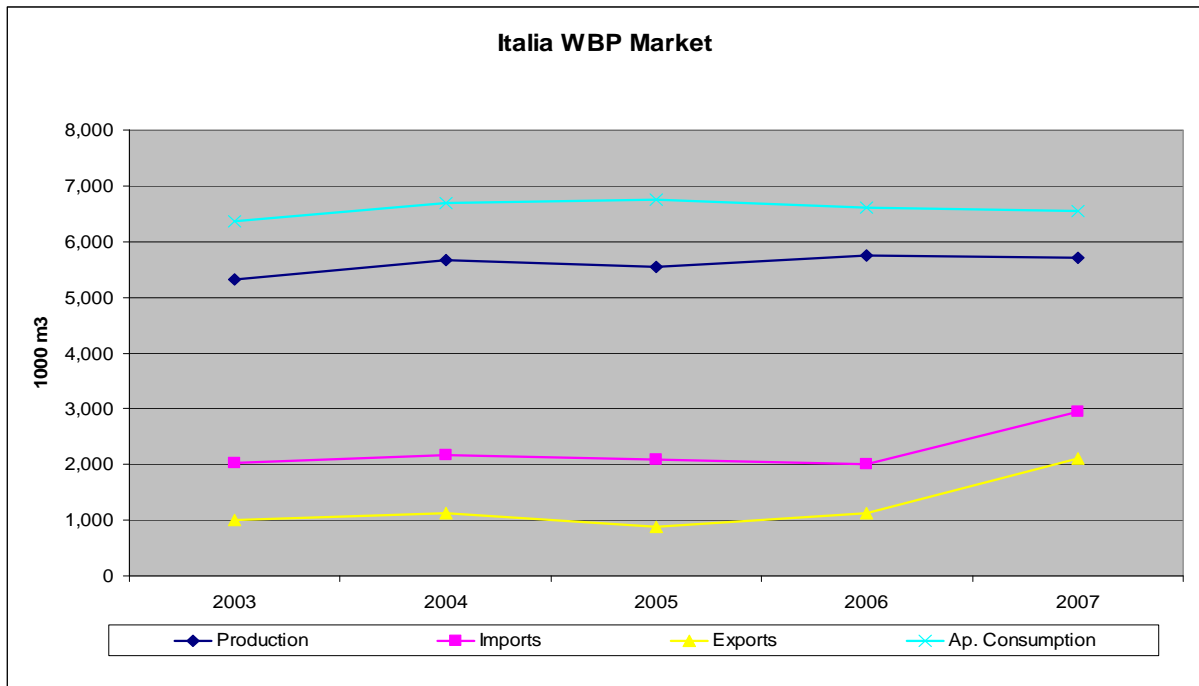
Figure 3.7



Source: United Nations Economic Commission for Europe, UNECE database

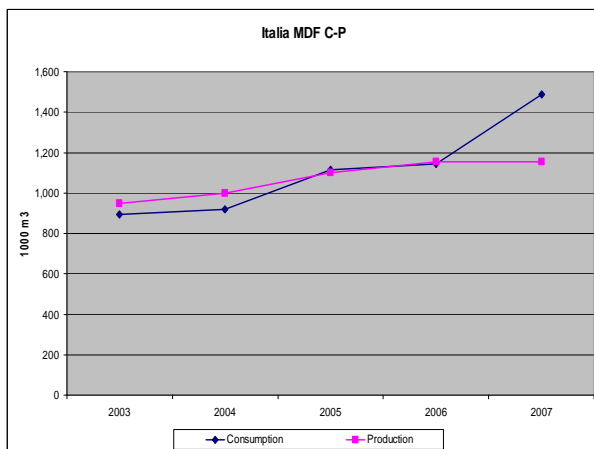
Consumption of WBP and MDF, as main competition to tropical wood products, is approximately 6.5 millions m³ and 1.5 million m³ respectively, production levels of WBP seem to be stabilized between 6 and 7 million m³ while imports and exports increased in the 2006-2007 period. MDF consumption has grown quickly in the same period and production remained almost at the same levels between 2005 and 2007; therefore imports have risen (Figure 3.8, 3.9 and 3.10).

Figure 3.8



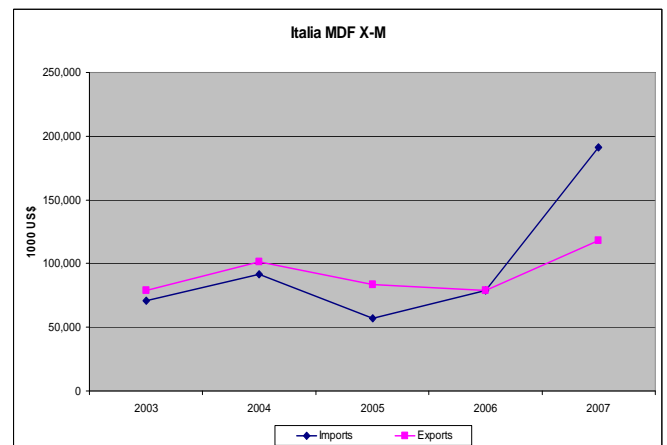
Source: United Nations Economic Commission for Europe, UNECE database

Figure 3.9



Source: United Nations Economic Commission for Europe, UNECE database

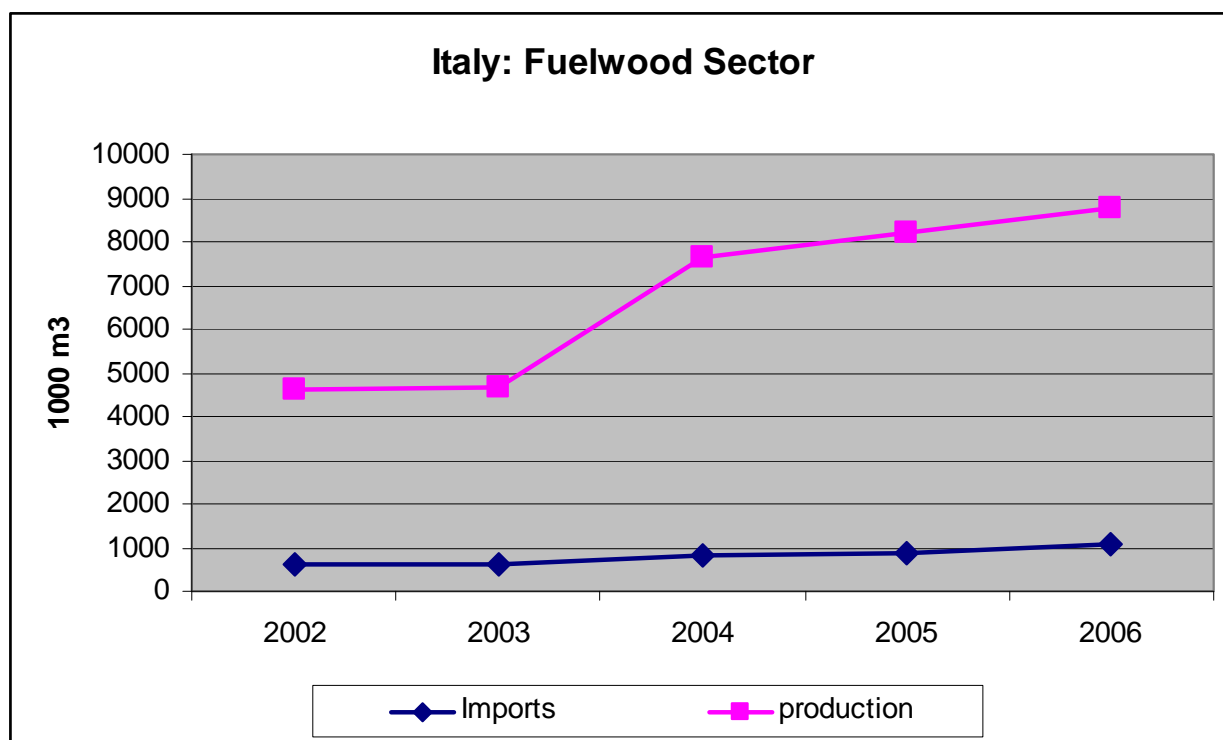
Figure 3.10



Source: United Nations Economic Commission for Europe, UNECE database

Relating to energy sector, production levels have risen up since 2003, it went from 5 million m³ to almost 9 million m³ in 2006; this increase of almost 100% is not reflected in imports of fuelwood (Figure 3.11). Imports of fuelwood approximately 1 million m³ in 2006, 40% more than 2002 and regarding trends this niche seems to be interesting in the future.

Figure 3.11



Source: United Nations Statistics Division – UNSD

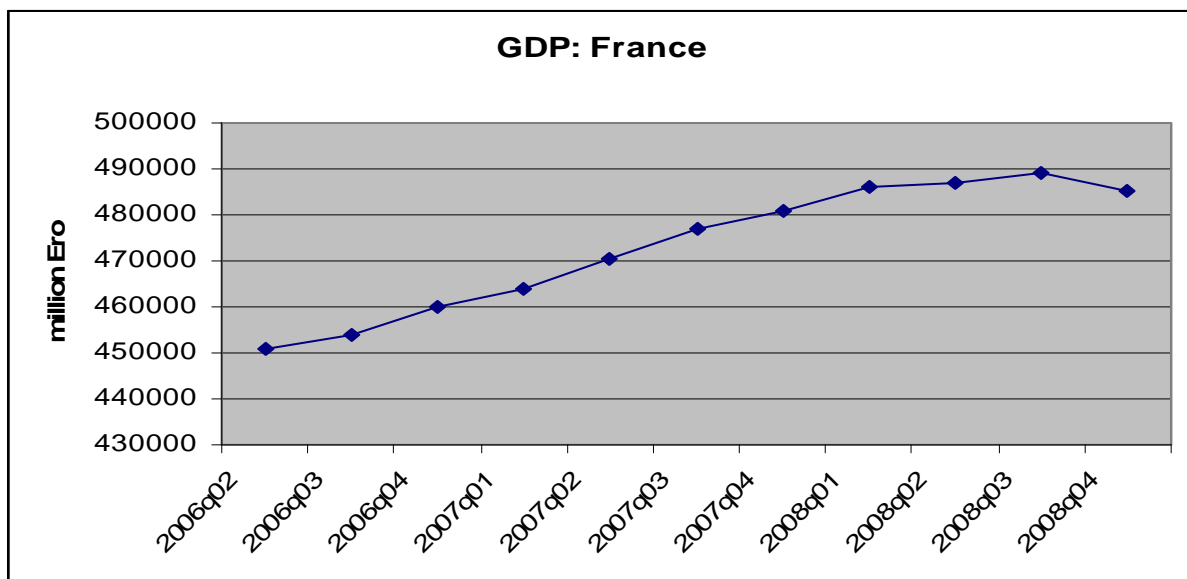
Summarizing market's trends in Tropical Timber Products:

Tropical Wood							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	increasing	increasing	flat	increasing	marginally	low increase	increasing
Exports	marginally	marginally	increasing	increasing	flat	----	saw tooth profile

3.5. French Market

France macroeconomic data, considering GDP, is one of the richest countries, its GDP by 2006 (constant 2000 prices) was 1,450,000 million \$US. There has been an increasing trend since 2000 and the fact that it is “The twentieth most populated country in the world and the second most populated in the European Union (EU) after Germany” (ITTO 2005), France is one of the major markets in the world. The Economic Crisis is reflected in figure 4.1 where a decreasing trend in 2008 is noticeable.

Figure 4.1



Source: Eurostat.

The market for tropical wood in France is related to construction and new requirements by architects. Traditionally in southern France, wood was generally used for the exterior when other materials could not be found. “The traditional wood-working craftsman’s skills are found in the forested areas stated above, whereas there are less such skilled wood craftsmen in the Mediterranean area” (ITTO 2005). Presently wood products are being distributed all over France due to traditional changes; even if this aspect explains major consumption in northern areas rather than southern ones.

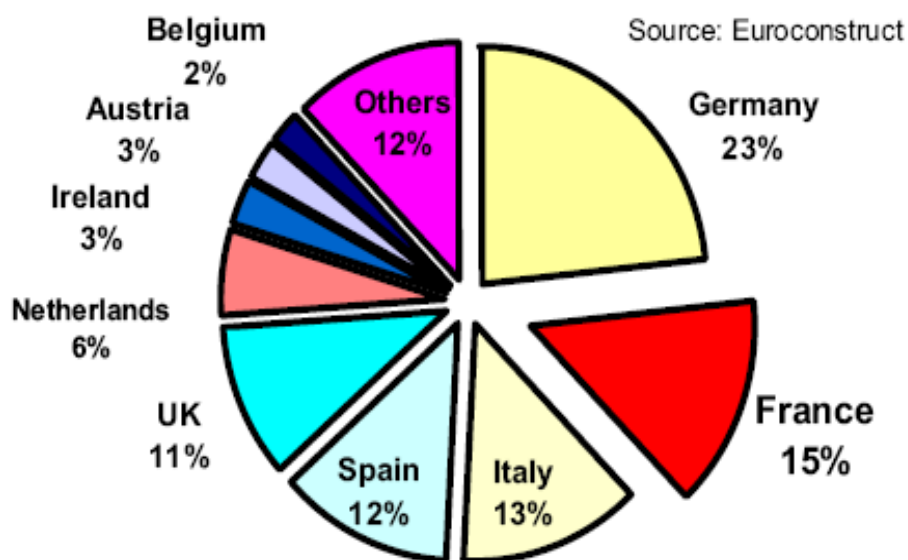
Regarding trends in market as described by Pedersen and Desclos, “The days are over when tropical timber was imported into France because it represented the cheapest mass raw material available. Today tropical timber is purchased by French industrials and distributors, on the merits of the inherent characteristics of each species. Each specific species, each

specific product specification, each specific quality definition corresponds exactly with a specific end-use application.”

The trade structure is configured in order to minimize costs by unnecessary intermediates and bring demand and offer of timber as close as possible. For example the creation of the web-site www.bois.com/professionnels/campagne where construction companies, architects, builders obtain information about wood-product use in technically advanced projects (ITTO 2005).

Figure 4.2

Shares of Western and Central Europe Residential Housing Market %

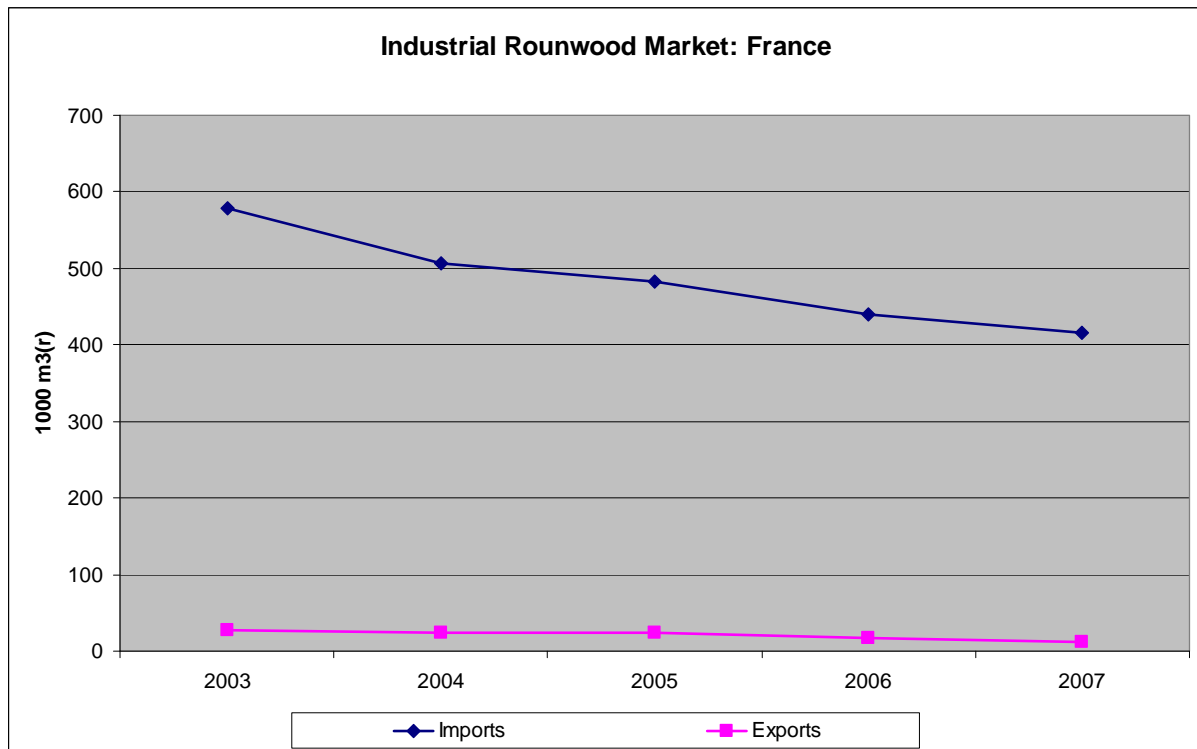


Source: Pedersen and Desclos, ITTO 2005

In relation to of home construction in France, until 2005-2006 factors as: low level of interest rates for loans, high prices of homes, non residential construction picking up, renovation and maintenance strong activities and tax-relief measures for certain types of works favoured the construction sector and subsequently wood trade and consumption. However available data shows low decrease in general consumption since 2007 and constrains are expected for the period 2008 and 2009 due to global economic crisis.

Since 2003, imports of industrial roundwood have decreased by 33% from 600 thousand m³(r) to almost 400 thousand m³(r) and is trending to decrease even more. Main suppliers are the Congo basin countries; Cameroon, Gabon, Congo (Brazzaville), Rep. Dem. of Congo and Equatorial Guinea. Exports instead are insignificant, approximately 12 thousand m³(r) in 2007 (Figure 4.3).

Figure 4.3



Source: United Nations Economic Commission for Europe, UNECE database.

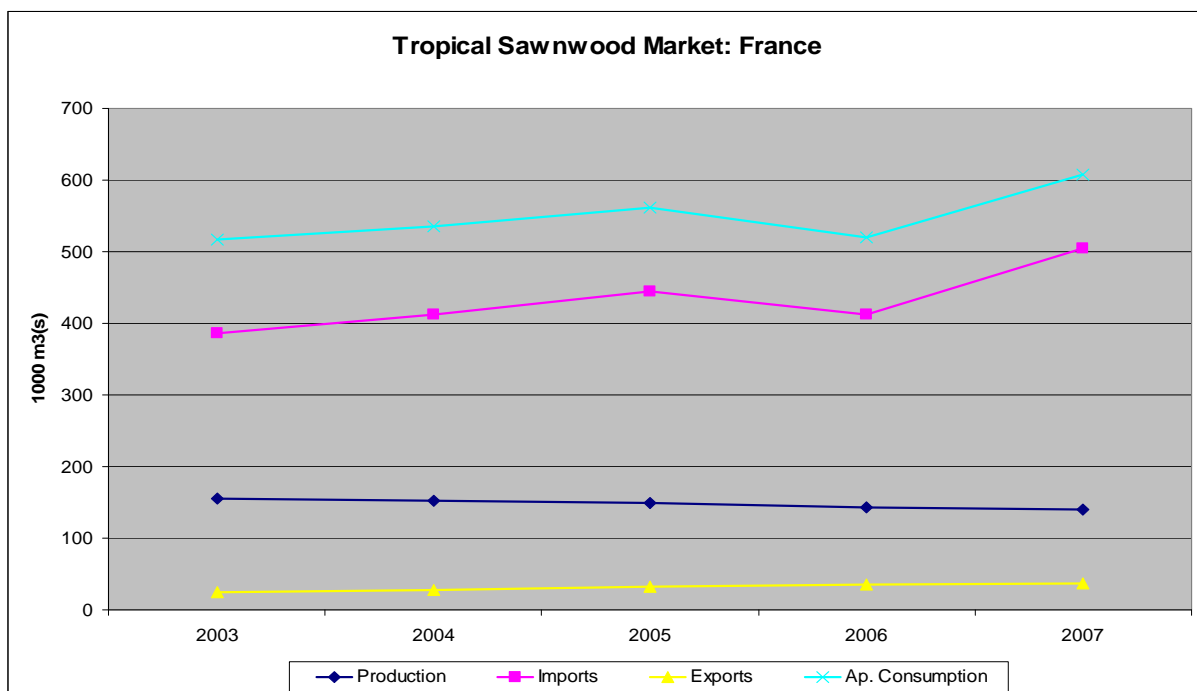
Regarding the Tropical Sawnwood market; “France imports wood from other countries when such wood represents a better solution than domestic timber. The authors analyse the imports of tropical sawnwood from different origins, and identify the end-uses for this sawnwood, as well as the characteristics of these species which make them attractive to the French market” (ITTO 2005).

The fact that the French market is the most species-flexible of all tropical timber importing countries is remarkable. “The French Industrial, distributor and consumer is the most species-flexible of any major market in the world. Provided a “new” species offers advantages, be it price, technical characteristics, aesthetics, specification, there is an openness in France to try

something new which is rarely found in other tropical timber importing countries” (ITTO 2005).

Apparent consumption and imports of tropical sawnwood has increased by 20% in the 2006-2007 period. Imports reached 500 thousands m³, the highest level in the last 4 years; Consumption rose from circa 500 thousands m³ in 2003 to 600 thousand m³ in 2007. Exports are insignificant compared to levels of imports. Local production shows a flat movement in past 5 years, approximately 150 thousands m³ (Figure 4.4).

Figure 4.4

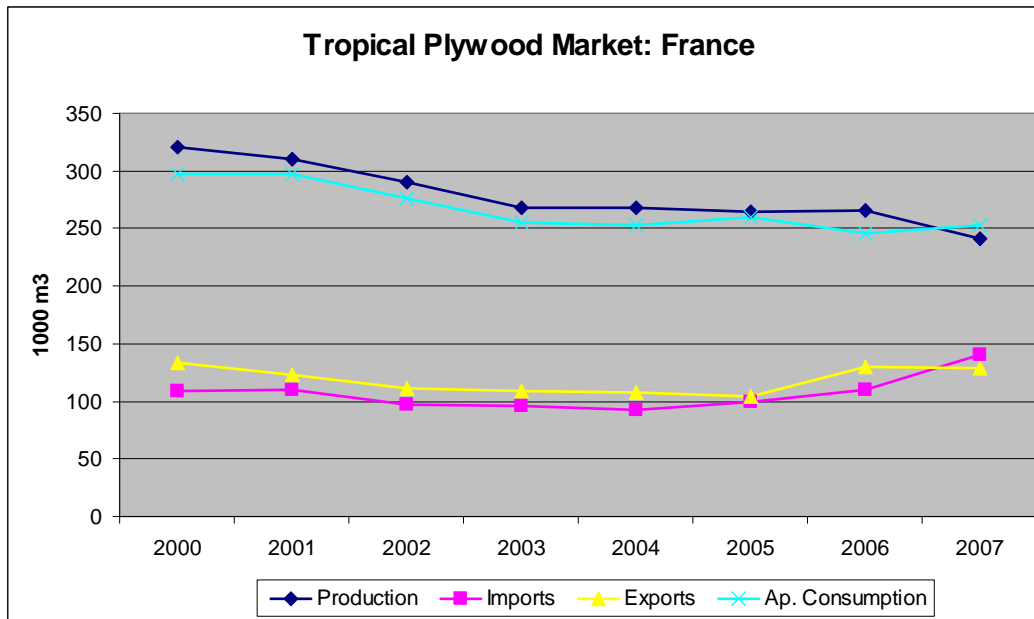


Source: United Nations Economic Commission for Europe, UNECE database.

The French tropical plywood market (Figure 4.5) has been affected by the raw materials competition; production tends to decrease every year as well as consumption. Decreasing rates of consumption are not as high as production rates. Imports have been increasing since 2005.

Considering Pedersen and Desclos’ statements; “As a consumer, importer, producer and exporter, France has a unique profile in the trade of tropical plywood, French companies have a long experience of tropical plywood manufacturing in France, but this sector is now in a serious crisis. Several French producers are facing severe difficulties” (ITTO 2005).

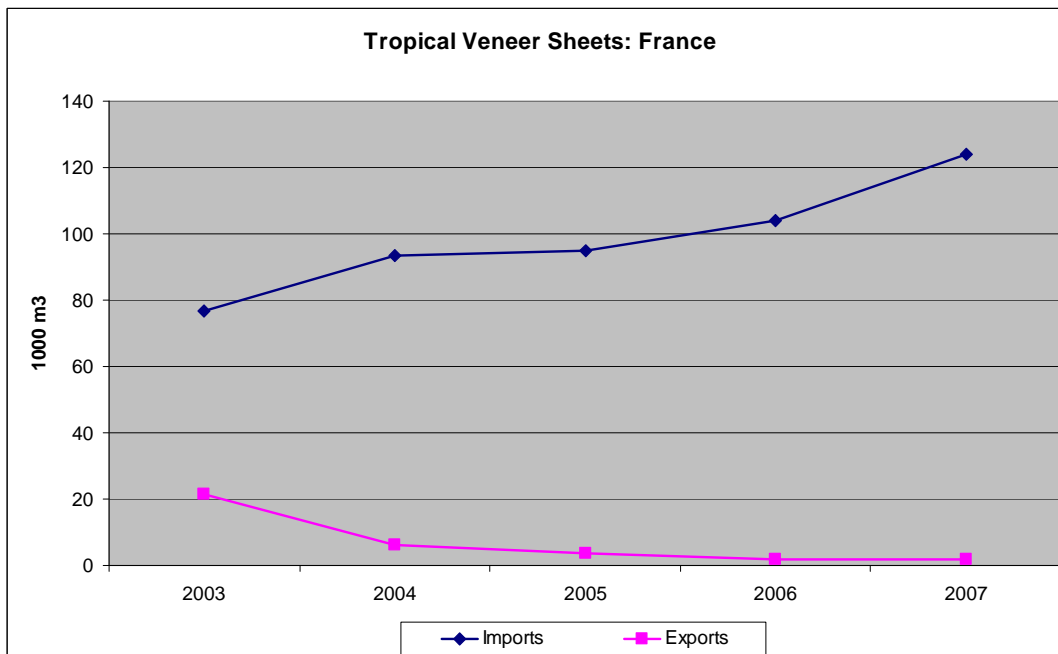
Figure 4.5



Source: United Nations Economic Commission for Europe, UNECE database.

Regarding the tropical veneer market, available data suggests that imports trends have grown by 40% from circa 80 thousand m³ in 2003 to 120 thousand m³ in 2007. The gap between exports and imports has increased every year for the reason that exports have decreased from 20 thousand m³ to 2 thousand m³ in 2007. (Figure4.6)

Figure 4.6



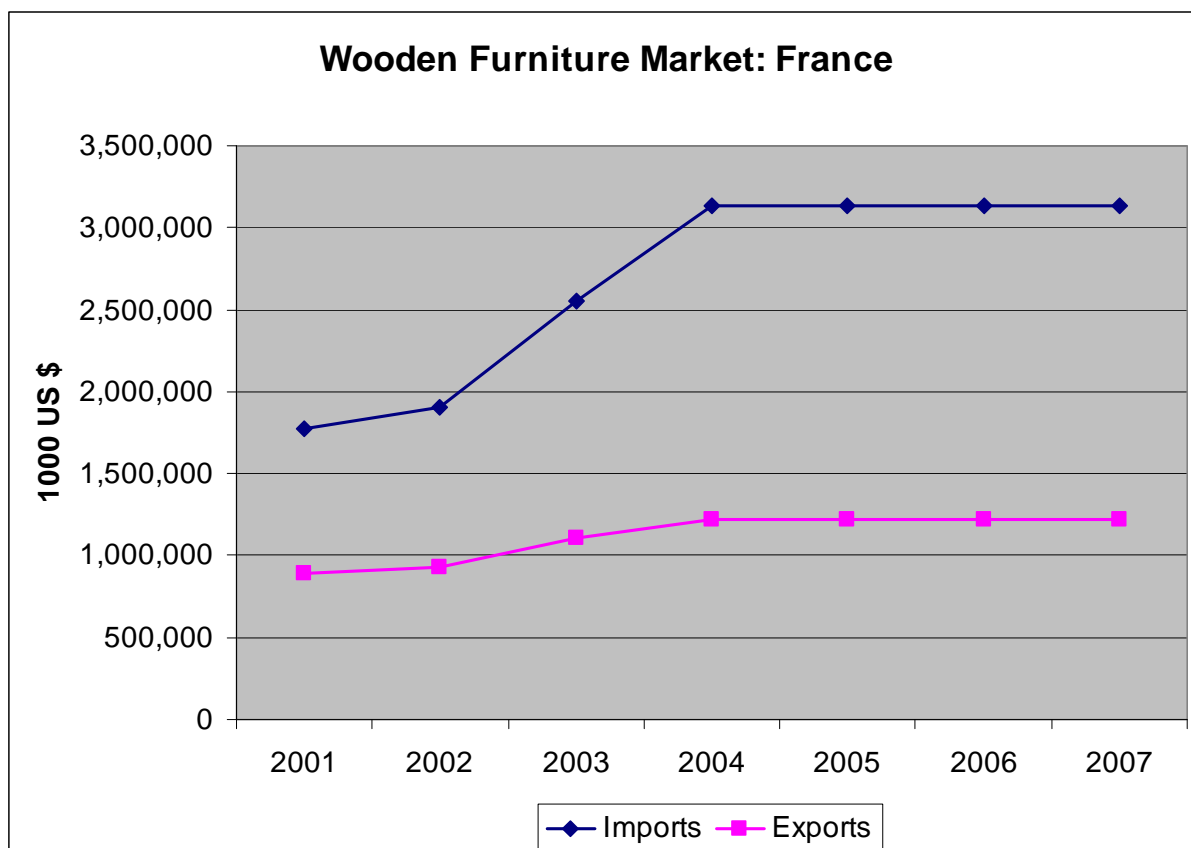
Source: United Nations Economic Commission for Europe, UNECE database.

Considering the French furniture market, “In 2004 France was the fourth largest importer of furniture and accounts for 4% of the global production. Most furniture pieces are products with a high value-added ratio. In some types of furniture, the wood material used is the very core of the value of the piece of furniture but in others, like upholstered sofas, the proportion of wood, in value and volume, is minimal while the piece of furniture is still classified under the heading “Seats, with wooden frames” (ITTO 2005).

According to the ITTO 2005 study, furniture imports from tropical countries corresponded to 13% of the total furniture import and 50% of the total tropical products import values. However the trend shows unmovable imports prices and a slight increase in exports (Figure 4.7).

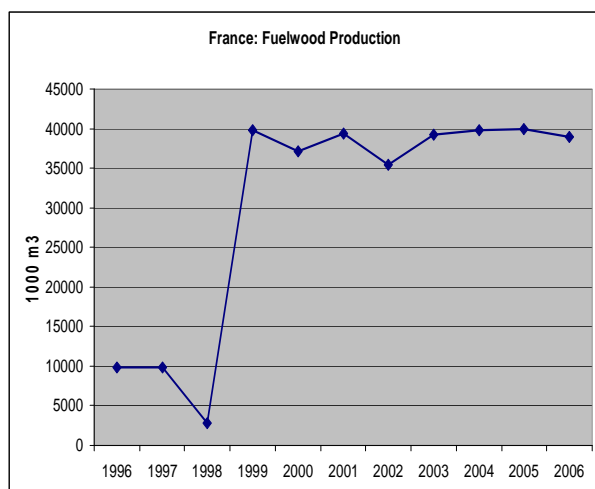
The gap between imports and exports has increased since 2002 from circa 1 billion \$US to more than 1,5 billion \$US in 2004 and since then it has been stable.

Figure 4.7



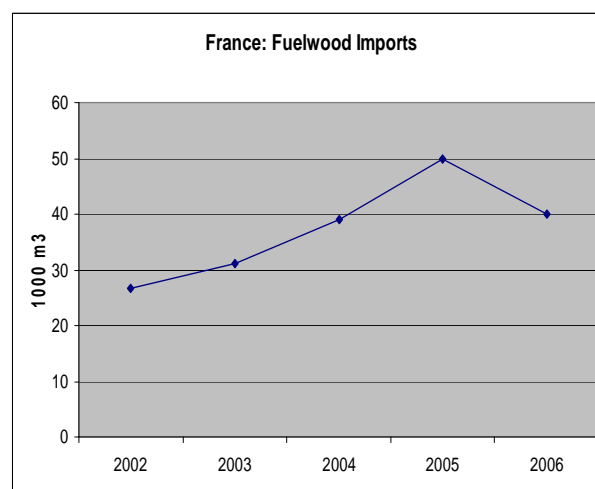
Source: United Nations Economic Commission for Europe, UNECE database.

Figure 4.8



Source: United Nations Statistics Division
– UNSD

Figure 4.9



Source: United Nations Statistics Division
– UNSD

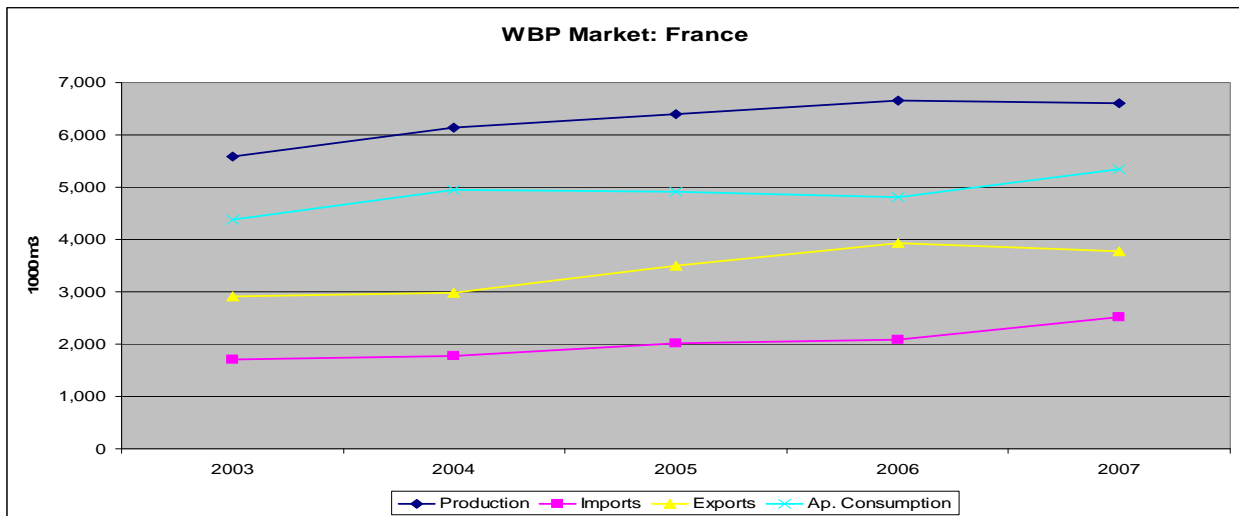
In the energy sector, fuelwood (where the share of pellets, charcoal, etc from tropical woods is not specified) production levels have risen since 1998. 1998 production represents 12% of 2006 production; level rose from circa 5000 m³ to almost 40 thousand m³. Imports instead are insignificant compared to production levels.

Demand on fuelwood products is expected to increase in coming years. Therefore, it is important to pay attention to data related to this matter in the future.

Regarding competition, “Tropical timber is competing, and will compete in the future in France, against alternative products, on the strength of the inherent technical and aesthetic characteristics of each species” (ITTO 2005).

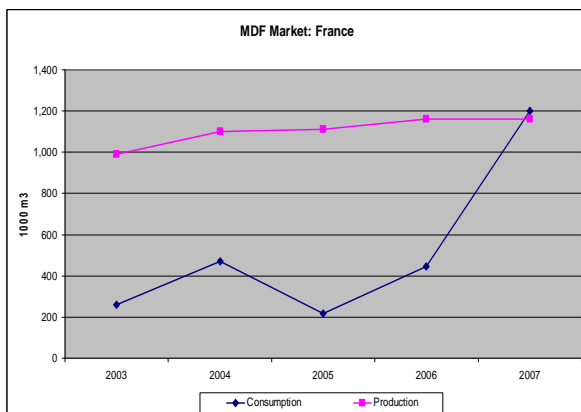
Consumption of WBP and MDF have been increasing since 2003; 22% for WBP and from 200 thousand m³ in 2003 to 1200 thousands m³ in 2007 for MDF. MDF imports have increased 75% between 2006 and 2007 because the production level has not risen. The WBP production is higher than consumption but nevertheless exports between 2006 and 2007 have shown a slight decrease. (Figures 4.9 & 4.11)

Figure 4.9



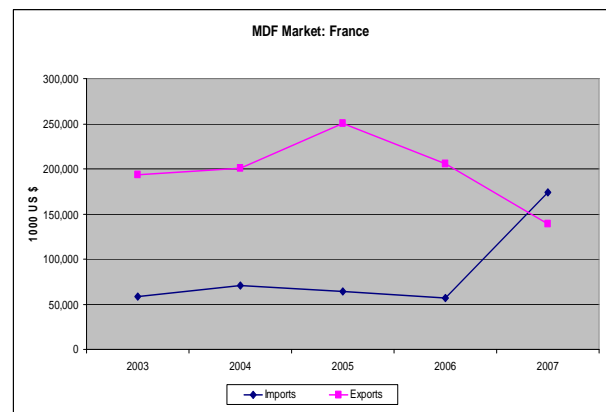
Source: United Nations Economic Commission for Europe, UNECE database.

Figure 4.10



Source: United Nations Economic Commission for Europe, UNECE database.

Figure 4.11



Source: United Nations Economic Commission for Europe, UNECE database.

Summarizing market's trends in Tropical Timber Products:

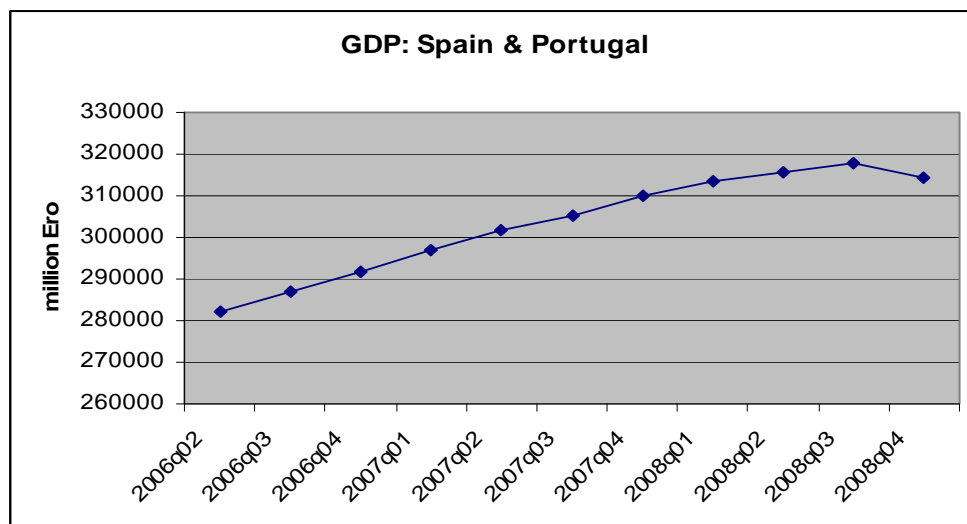
Tropical Wood							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	decreasing	increasing	low increase	increasing	High, Flat	low increase	increasing
Exports	decreasing	marginally	flat	decreasing	flat	----	saw tooth profile

3.6. Iberian Market

The macroeconomic data of Spain and Portugal in relation to the GDP by the end of 2008 reached circa 3.2 billion euro (Figure 5.1), almost 36% less than the French GDP and 5% less than the Italian GDP. Altogether, the GDP increased until 2007 when the world financial crisis affected these economies.

The relevance for tropical wood producers in these markets is the reason that “the domestic timber harvest does not represent any present or future threat; the vast majority of this roundwood is used for making pulp, paper, chipboard and other process boards.” (ITTO 2008) and consumption is related to demand preferences rather than tradition in the specific market niches.

Figure 5.1



Source: Eurostat

Housing construction is the main wood products consumer; housing trends directly affect wood consumption and, as a consequence of the world financial crisis, the construction sector is “experiencing a substantial slow-down since the Summer Holidays of 2007” (ITTO2008). Therefore wood consumption is expected to decrease by 2010.

The Spanish construction sector, as explained by Pedersen and Steves: “annual housing construction went over 800,000 units in 2006. The abrupt turndown in new construction,

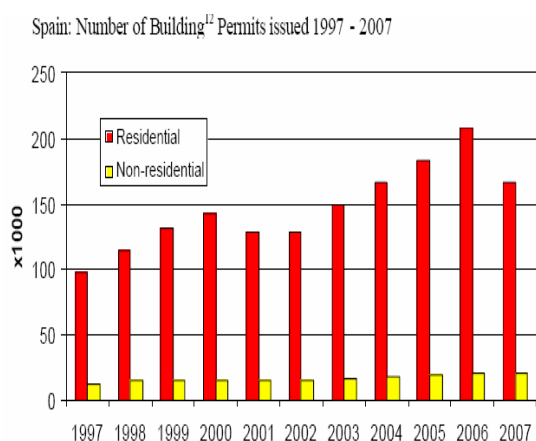
significant since the summer holidays of 2007, is expected to last into 2010, perhaps longer” (ITTO 2008).

Furthermore, suppliers during this period have been trying to maintain competitiveness in the sector; “Timber importers as well as manufacturing industries are looking for ways to weather the downturn in existing activities, through product diversification, product development, new marketing initiatives, including export, etc.” (ITTO 2008)

In the Portuguese construction sector, new constructions continues to decrease annually, “The activity in the construction sector continued its now seventh year of decline, the accumulated reduction in construction volume, compared with 2001, is around 37%. The Portuguese construction industry has lived through a period of recession ever since the very high levels of activity which it enjoyed during the 1990s” (ITTO 2008). However new government assumption in the current year is expected to increase the public fee, especially in the construction sector.

As low levels of new constructions are expected in Spain and Portugal for the current year, wood products seems to move toward new market niches, then “coming years will depend for some 50% on the construction of new housing, the other 50% going to new construction of other -than-housing in combination with renovation of all buildings etc.” (ITTO 2008)

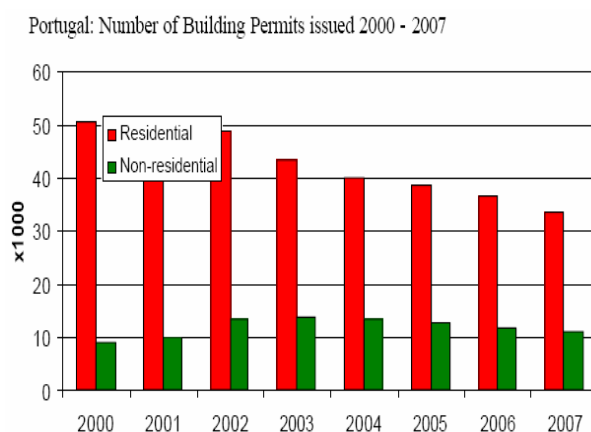
Figure 5.2



Source: INE, Ministerio de Fomento

Quoted by Pedersen and Steves, ITTO 2008

Figure 5.3



Source: AICCOPN/INE

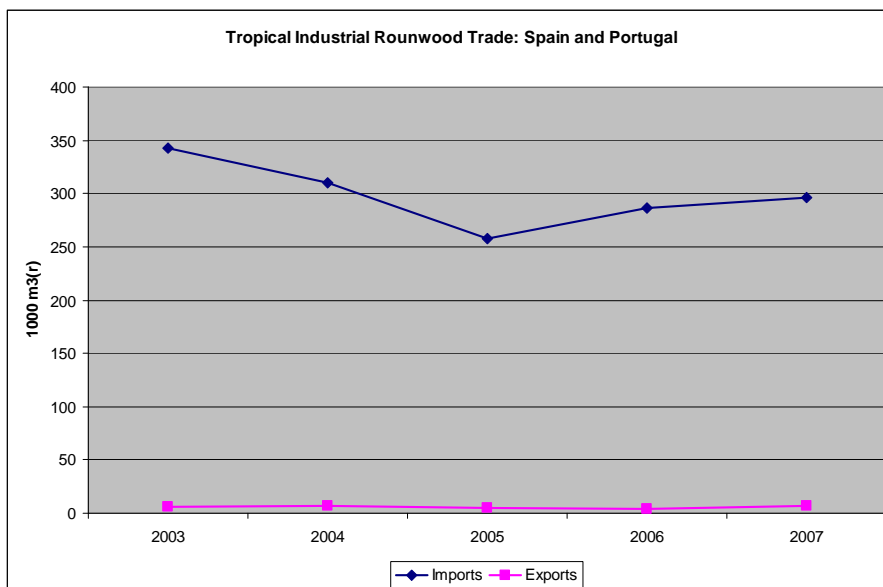
Quoted by Pedersen and Steves, ITTO 2008

Regarding the tropical wood market, like in most countries, specific data identifying the production and trade of timber products made from tropical wood is not clear enough. Nevertheless, available data indicates in most items a saw tooth movement.

Altogether industrial roundwood trade (Figure 5.4) confirms the decreasing import trend. It declined from almost 350 thousand m³(r) to 300 thousands m³(r) during the 2003-2007 period. “This decline is expected to continue, as the tropical timber producing countries are exporting less or no logs, increasing the export of first or secondary processed wood products.” (ITTO 2008)

Spain and Portugal’s main suppliers of industrial roundwood are African countries from the Congo River basin, where log exportation is not yet forbidden

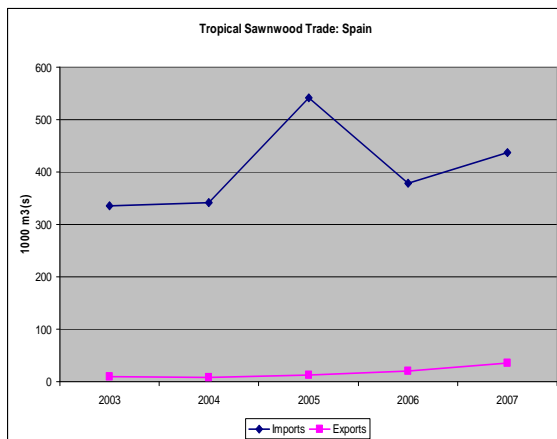
Figure 5.4



Source: United Nations Economic Commission for Europe, UNECE database.

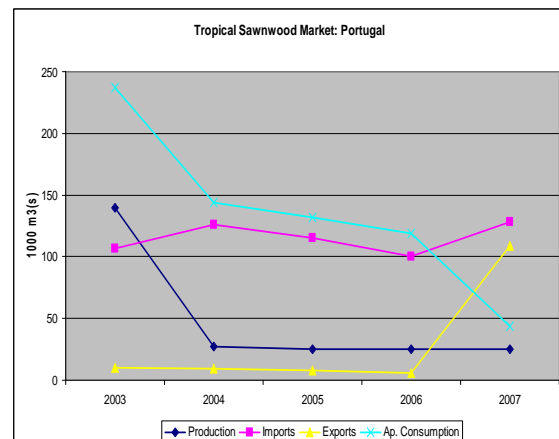
Regarding tropical sawnwood (Figures 5.5 & 5.6), Spaniard imports show a saw tooth movement from 2003 until 2007, nevertheless in the same period imports have increased 30% reaching a maximal value of 541 thousand m³ in 2005. On the other hand, Portuguese consumption has decreased from circa 250 thousand m³ in 2003 to almost 50 thousand m³ in 2007; as a consequence exports have increased while imports remained almost constant.

Figure 5.5



Source: United Nations Economic Commission for Europe, UNECE database.

Figure 5.6



Source: United Nations Economic Commission for Europe, UNECE database.

Considering that Spanish imports count for almost half of its sawnwood requirements, “48% tropical wood represents only 5% of the total sawnwood consumption” (ITTO2008); suppliers can “achieve better yield from their raw material than species/grades/qualities required for many other destinations” (ITTO2008) as Spanish requirements are not inflexible.

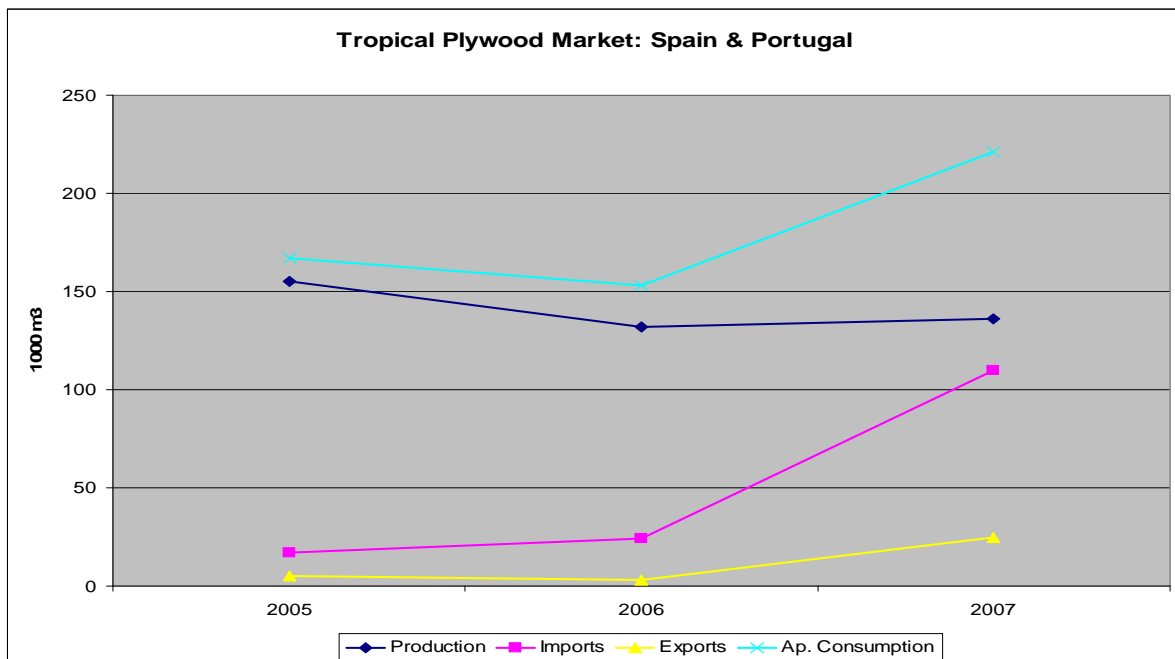
Instead, Portugal imports count for almost one third of its sawnwood requirements and also considering that: the tradition on tropical hardwood use and low level construction activity sawnwood market is still an interesting market.

Regarding the plywood market “Portugal, like Spain, is a very small market for plywood, compared with Northern European countries such as the UK, the Netherlands, and Denmark” (ITTO 2008).

Altogether consumption in 2007 reached 221 thousand m³, where almost 50% was satisfied by imported plywood, mainly from China. Imports have increased since 2005 from 17 thousand to 110 thousand in 2007. Production instead, has decreased and moves around 140 thousand m³ (Figure 5.7).

Considering that main suppliers such as China, Indonesia, Malaysia and Brazil (Figure 5.8) are increasing their market share and the decreasing production trend; the tropical plywood niche in these countries seems to have an interesting future as long as construction sector recovers.

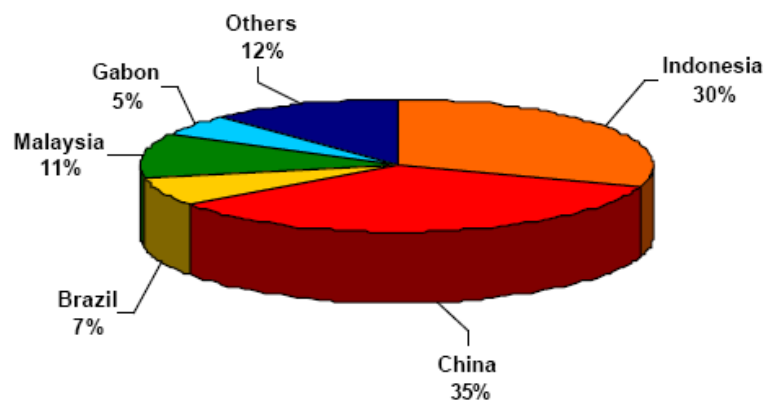
Figure 5.7



Source: United Nations Economic Commission for Europe, UNECE database.

Figure 5.8

Europe Tropical Plywood Imports 2006 by origin



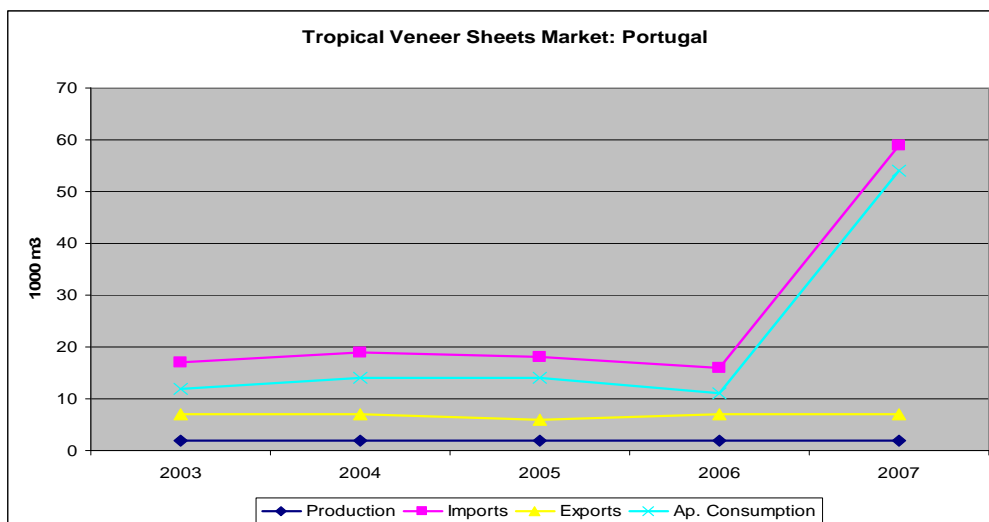
Source: FEIC

Quoted by Pedersen and Steves, ITTO 2008

As described by Pedersen and Steves (ITTO 2008) “The European wood industry consumes increasing quantities of board products, and less solid wood. The demand for sliced veneer is therefore continuing”. Spain and Portugal are not the exception; the consumption in Portugal has increased in the period 2006 and 2007 and the Spaniard has remained almost constant. Imports are increasing in both cases, but the highest growth level was in Portugal. (Figures 5.9 & 5.10)

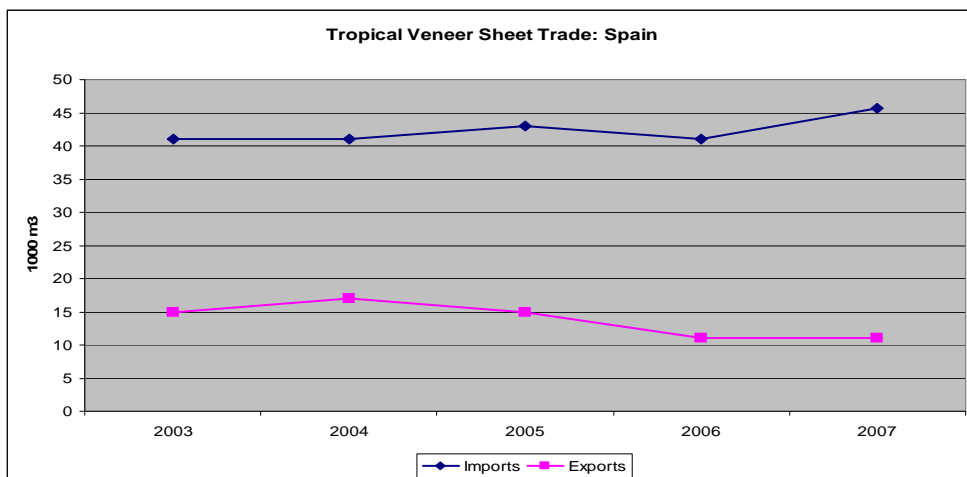
Main suppliers for tropical veneers are: Brazil, Gabon, Ivory Coast, Ghana, Cameroon and China.

Figure 5.9



Source: United Nations Economic Commission for Europe, UNECE database.

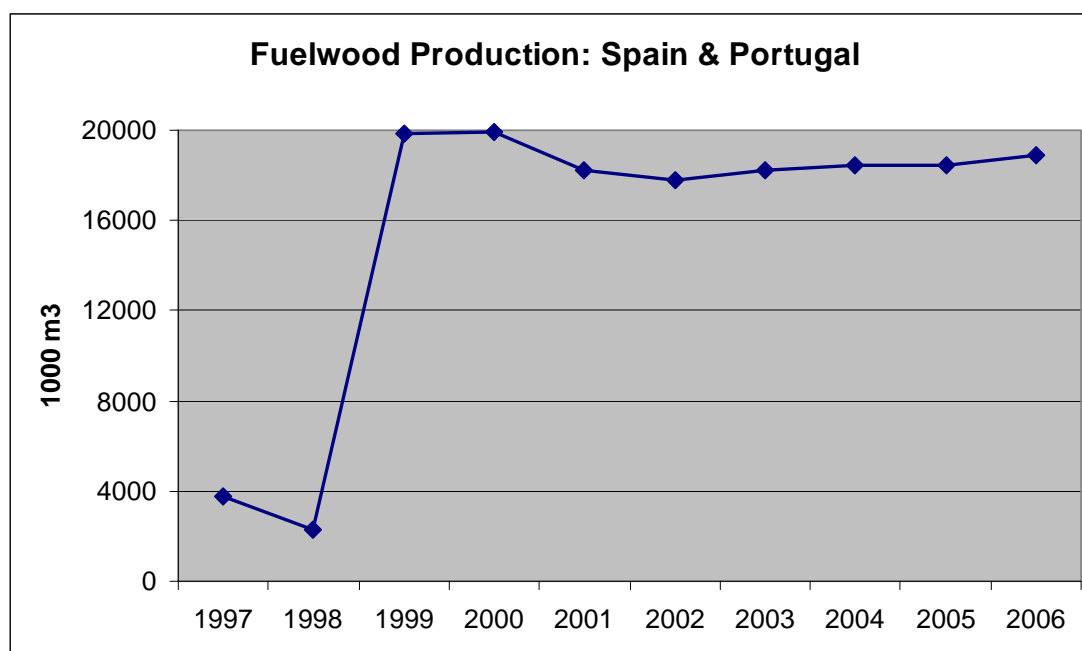
Figure 5.10



Source: United Nations Economic Commission for Europe, UNECE database.

In the energy sector, fuelwood (where the share of pellets, charcoal, etc from tropical woods is not specified) production levels have risen up since 1999, levels rose from less than 4 million m³ to almost 20 million m³ in 2006 (Figure 5.11); this increase though is not reflected in imports of fuelwood which are still marginal. Demand on fuelwood products is expected to increase in coming years therefore it would be important to pay attention to data related to this matter in the future.

Figure 5.11

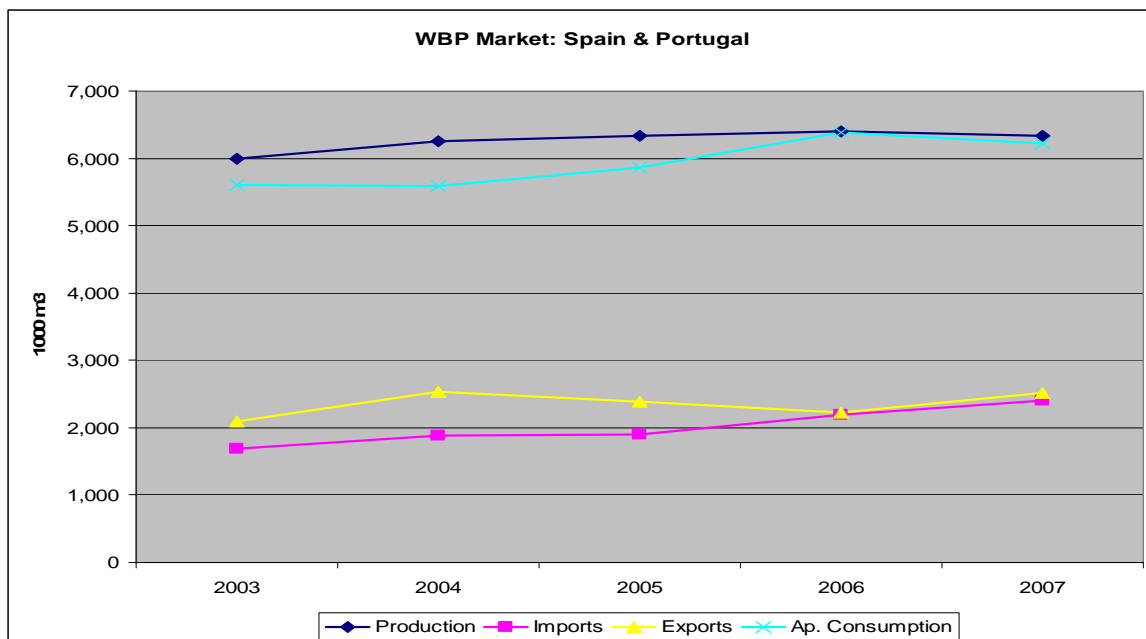


Source: United Nations Statistics Division – UNSD

Regarding competition, it is important to notice their trends taking into account the Pedersen and Steves description of consumption, which can be expanded to all wood products, explaining that “consumption appears to be levelling out, at a low level of activity, but the hope is for somewhat better activity in the years to come. In such market circumstances, competition is strong, everyone seeks the lowest price – this does not favour high-priced wood products made from tropical sawnwood in Iberian Countries” (ITTO 2008).

Production of WBP has remained during the last 5 years more or less at the same level. Apparent consumption increased slightly, 10% in 5 years showing a low decrease in the period 2006-2007. Imports instead, showed an average increase of 10% annually in 5 years; it went from 1.6 million m³ to 2.6million m³ in 2007. (Figure 5.12)

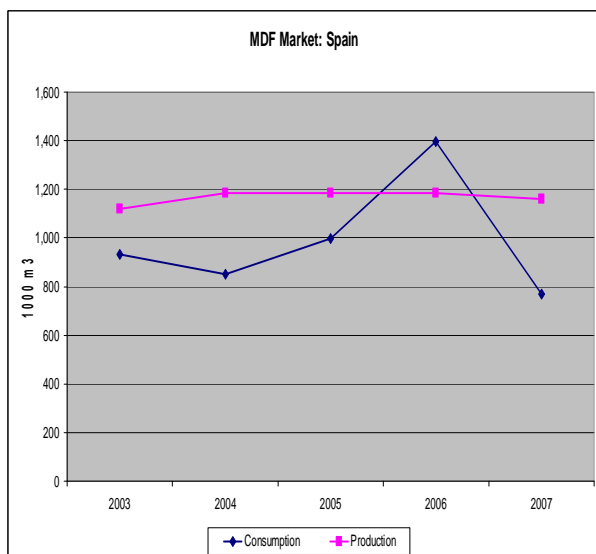
Figure 5.12



Source: United Nations Economic Commission for Europe, UNECE database.

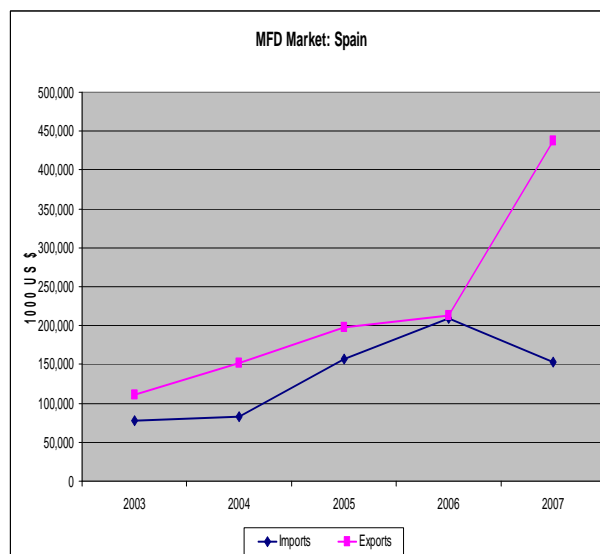
In relation to the MDF market, Spaniard consumption has abruptly fallen between 2006 and 2007; as a consequence exports have increased and imports decreased while production levels have remained at the same levels compared to precedent years.

Figure 5.13



Source: United Nations Economic Commission for Europe, UNECE database.

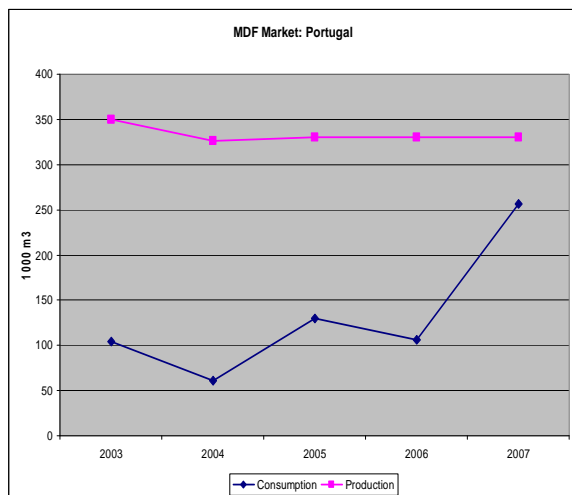
Figure 5.14



Source: United Nations Economic Commission for Europe, UNECE database.

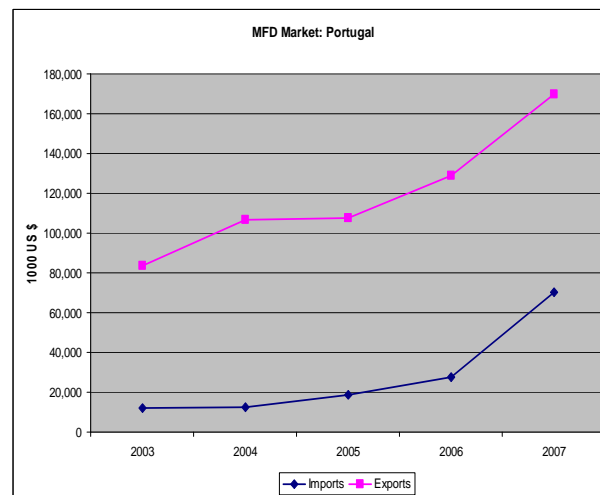
The Portuguese MDF consumption has increased since 2003 while production levels have decreased; therefore taking into consideration the fact that exportation has increased as well, importations have increased more than 100% between 2003 and 2007.

Figure 5.15



Source: United Nations Economic Commission for Europe, UNECE database.

Figure 5.16



Source: United Nations Economic Commission for Europe, UNECE database.

3.7. Main Market Summary

Tropical Wood: USA							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Flooring	Trends of Competition (MDF, WBP, Temperate woods)
Imports	Saw tooth profile	Flat	High '00-'06, Flat since then	decreasing	up	Fast growth	Flat
Exports	Low	Flat	low	Flat	low	low	Flat

Tropical Wood: Japan							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	---	marginal	decreasing	decreasing	----	---	---
Exports	---	---	decreasing	decreasing	----	----	---

Tropical Wood: China							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	Flat	increasing	Flat, low	flat, low	Low	low increase	increasing
Exports	low	low	increasing	increasing	up	----	increasing

Tropical Wood: Italy							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	increasing	increasing	flat	increasing	marginally	low increase	increasing
Exports	marginally	marginally	increasing	increasing	flat	----	saw tooth profile

Tropical Wood: France							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	decreasing	increasing	low increase	increasing	High, Flat	low increase	increasing
Exports	decreasing	marginally	flat	decreasing	flat	----	saw tooth profile

Tropical Wood: Spain							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	decreasing	increasing	high growth	increasing	not analyzed	low increase	increasing
Exports	marginal	marginal	decreasing	decreasing	not analyzed	----	saw tooth profile, decreasing

Tropical Wood: Portugal							
	Roundwood	Sawnwood	Plywood	Veneer	Wooden Furniture	Fuelwood	Trends of Competition (MDF, WBP, Temperate woods)
Imports	decreasing	increasing	High increase	high increase	not analyzed	low increase	increasing
Exports	marginal	increasing	low increase	flat	not analyzed	----	saw tooth profile, decreasing

The six major markets analyzed have as a common issue the relation between housing construction and tropical wood demand. Most of tropical timber imports are used as structural components or for uses where due to its particular characteristics have been traditional used; such as: structural pieces, stairs, flooring, etc.

The current economic crisis is affecting purchasing power and new house' building starts; there are some issues to take into consideration such as the declining GDP, production cut backs and consumption declines in nearly every segment.

Imports of tropical roundwood have remained at low levels with a declining trend. Factors such as logs exports prohibition in supplier's countries, environmental issues, high transportation costs, processing labour costs, lower prices and better qualities of non tropical logs are all contributing to this decline in trade of tropical logs.

Through all the traditional products (logs, sawnwood, furniture), plywood has remained more or less stable, trends show it will remain that way; nevertheless, competition with cheaper raw materials is menacing these products. Veneers instead, depend on the country requirements, for example in France (ITTO 2005) peeled, sliced and sawn veneers are very distinct products belonging to very different domains:

- Peeled veneers manufacturing is a step of the plywood manufacturing process. As such this activity is fully integrated in the plywood plants and, practically, is not considered in France as an independent activity. It accounts, by far for the largest part of the production.
- Sliced veneer manufacturing, on the contrary, while a much smaller activity in matter of volume, is an independent activity with import, export and domestic trade.
- Sawn veneers are produced in very small volumes in small units. This product is mainly used in cabinet making and is often closer to craftsmanship than to industry.

Tropical sawnwood, as described in the Chinese and US market, is used to produce most of the solid wooden flooring; therefore its demand is closely linked to the flooring sector.

Ageing population in Europe, Japan and China will deeply affect the wood market, less economic active population is reflected by fewer purchases; however this effect is not expected in the US.

Fuelwood is slowly increasing in major markets; it is a niche where some advantages could be taken in the future for tropical fuelwood (pellets and charcoal for example).

Regarding threats, the major ones are the new formaldehyde emissions standard to be achieved by producers and exporters in the US market and the new ISO standards which would also be implemented as well in coming years for secondary processed wood products.

The inadequate forest resources of China, Europe and Japan reflect the lack to sustain the present wood industries and it is especially deficient in high value, large diameter hardwoods.

Regarding new species introduction, amongst the traditional timber importing countries, France is the most species flexible wood market, followed by the US. Iberian countries instead, have flexible specifications and qualities which will generally allow the tropical timber producer to obtain a better yield when selling to the more selective markets.

Market trends in the six markets have moved like this:

Figure 7.1

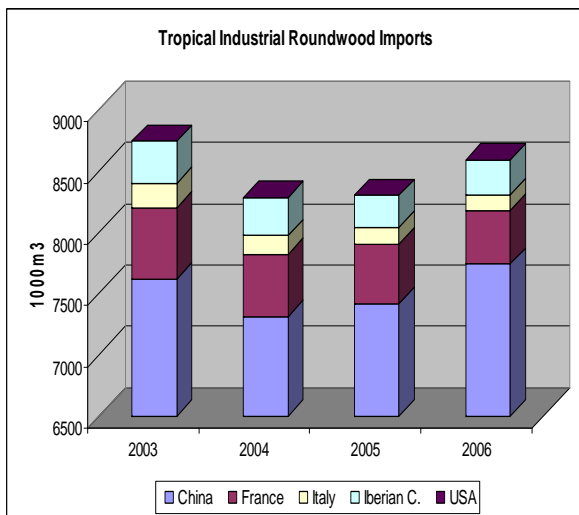


Figure 7.2

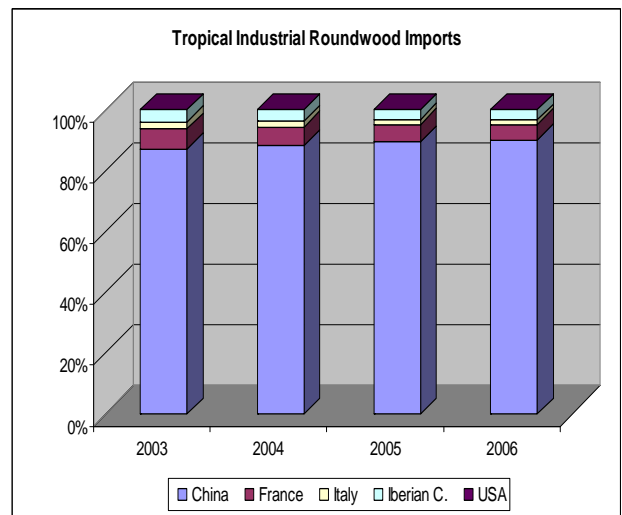


Figure 7.3

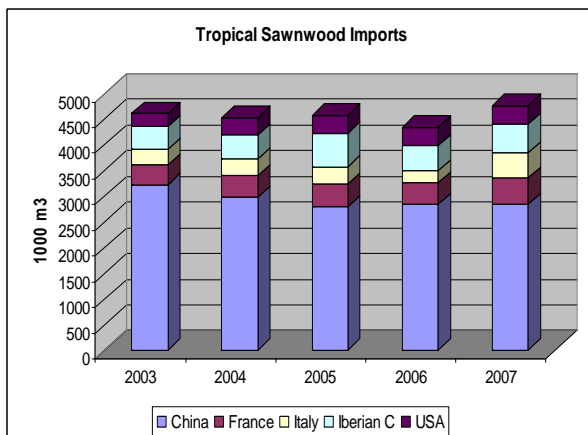


Figure 7.4

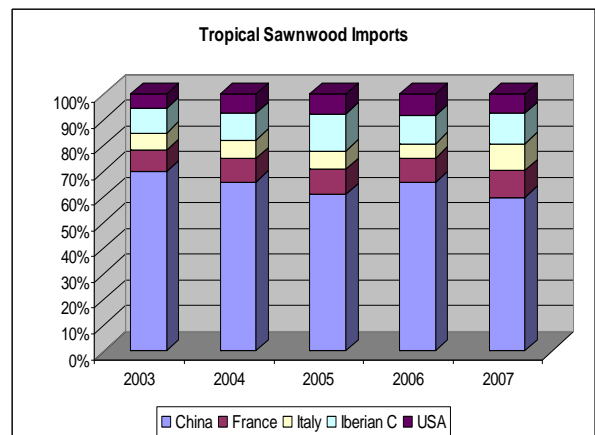


Figure 7.5

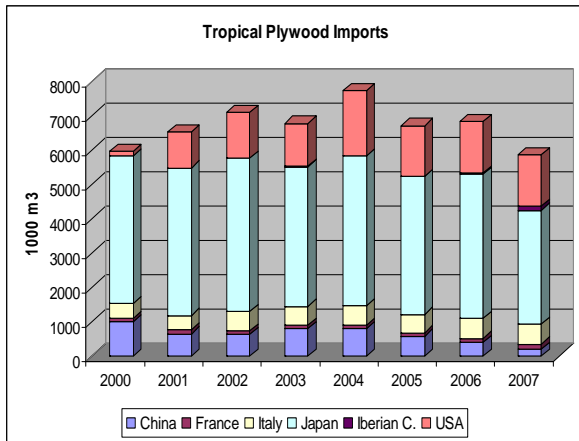
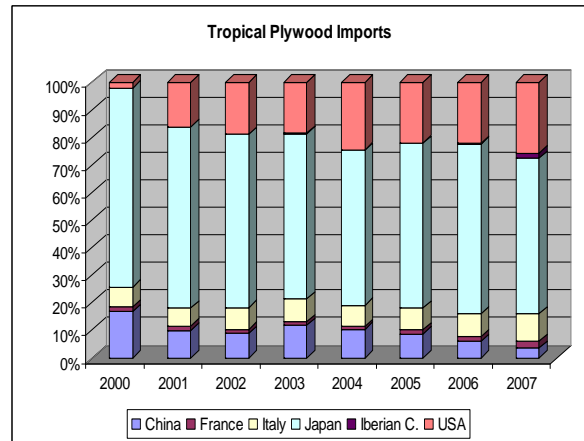


Figure 7.6



4. International Transport of Tropical Timber

Due to the fact that major markets for tropical woods, like the European Countries, Japan, the US, are far from main suppliers in Asia, Africa and South America, it is important to describe logistics aspects related to their international transport. Competitiveness of wood products in major markets is also a result of good transportation logistics.

It is essential to describe timber transportation from forest to the final consumer in view of key aspects such as traceability, certification, legality among others; the ITTO 2007a report on lumber transportation describes three ways of bringing timber from forest to ships or vessels.

First, most timber from forest production is carried by trucks covering short distances from forest to the mill and/or the port of export. This forest transport is generally operated by the forest operator with locally owned and purchased trucks.

Secondly, railway transportation: this method is cheaper than and preferable to using trucks. Logs and processed products are loaded on railways as bulk cargo or in containers, on appropriated carriages and transported to port.

Thirdly river transportation: this mode of transportation is often preferred by inland producers, forest dwelling peoples and concession holders since the adjacent or nearby waterway provides direct access from the forest to the port of export. Combining river transport with trucks and/or railways is the cheapest method of transportation in the Amazon, Congo Basin, and Borneo. On rivers, timber is transported by raft (logs only) or on barges (all products). Usually, barges are locally owned by concession holders who ensure transportation to the port of export.

Once products arrive to ports, they are loaded to vessels, which are divided in three main types to transport timber products (described by ITTO 2007a), depending on the product (roundwood, sawnwood, etc).

- **Bulk Carriers:** All vessels designed to carry bulk cargo such as grain or logs. With a capacity between 5.000 and 25.000 Long Tons, bulk carriers are mainly used for logs, bundles or pallets.
- **Container ships:** Ships equipped with permanent container cells, with little or no space for other types of cargo. They usually take regular routes such as lines between Africa to Europe, or between South East Asia and North East Asia. Talking about producing countries, container ships bring processed products such as television, etc... and come back for example with sawntimber.
- **Roll-on/Roll-off vessels:** Ships specially designed to carry wheeled containers or trailers using interior ramps.

Currently decreasing log exchanges and increasing exchange in processed products have changed the way wood is transported “There have been fewer cargo vessels available to transport timber as incoming vessels are increasingly of the container vessel type, and bulk vessels have been tied up in Asian destinations” (ITTO 2007a).

Containerization transport is currently the main way for sea transport, as it offers advantages such as:

- Loading processed products
- Providing protection against pilferage and damage,
- Providing greater flexibility in managing by simple trans-shipment the many combinations between the port of shipment and destinations

Effect on transportation as described by the ITTO 2007a report is “that regular lines are offering fewer bulk carriers and more container ships”.

Another effect of changing trends in timber shipping, described by ITTO 2007a report, consists in the difficulties of checking the cargo in the container itself:

- Supplier and customs authorities compute in m³
- Ship computes by “boxes” therefore weight

Relating to this subject, suppliers must balance technical aspects (shrinkage of wood, moisture content, volume, weight) to maximize the space in the container. However frequently suppliers' countries do not have enough technical knowledge of timber species or do not have technical tools due to industry scale to make good decisions.

Regarding documentation which is required for loading, include five indispensable documents:

- Timber specifications
- Cargo invoices
- Certificate of Origin
- Phytosanitary Certificate
- Bill of Lading (B/L)

As explained by the ITTO report:

Timber specifications: This is a list of products with the details of each piece such as the vernacular name of the species, type of product, number of pieces, measurement and volume, port of shipment, and also the destination and generally the name of the ship.

Cargo invoices (commercial invoices): This represents a complete record of the transactions between exporters and importers with regard to the goods sold. It also reports the content of the shipment and serves as the basis for all other documents about the shipment.

Certificate of Origin: Established by the administration (coordination between forest, customs authorities and trade or export services), this official paper summarises the items of the specification and commercial invoice in order to confirm the country of production and the conformity of the cargo. This document is generally requested in consumer countries for paying taxes (depending on a given country's tax or other agreement with the exporting country).

Phytosanitary Certificate: This document is usually issued by the local Department of Agriculture to satisfy consumer country import regulations. Regarding timber, it indicates whether a Cargo has been treated with non- prohibited products against xylophages and moulds, and attests that the cargo is free from worms and fungal diseases.

Bill of Lading (B/L): This document establishes the terms of a contract between a shipper and a transportation company. It serves as a document of title, a contract of carriage and a receipt for goods. It describes the goods but cannot guarantee the cargo's origin and compliance with national laws. The B/L (which indicates the commercial volumes) doesn't necessarily reflect the official export volumes (real volumes) which are declared for customs.

Producers in tropical countries may be at a disvantedged position, as compared to producers in developed countries, regarding the availability of the overseas infrastructure, logistic knowledge and other transport related matter.

5. Opportunities for Tropical wood producers

Opportunities for tropical wood producers from developing countries to sell into major global markets are closely related to product quality and specifications, prices, environmental issues, product's traceability and the way products are promoted (marketing). While these producers have a direct input to control their production costs and or improve product quality, they are still much less directly involved when it comes to co-defining the “environmental” and/ or ‘legal” standards / procedures that are increasingly becoming important factors in governing the tropical timber trade. Tropical producers will thus have to become much more pro-active in the definition of the environmental and legal procedures of the timber trade.

Thus, Certification (as CoC or SFM) is an important factor to open or maintain market's niches. Production philosophies as the “green production” or fair trade would permit suppliers countries to reach competitiveness regarding environmental, social and economic issues. New requirements by main markets (Green Building codes, E2commerce) give the opportunity to open new market niches and initiatives like the EU FLEGT with both opportunities and threats.

Subsequently each one of them will be briefly described, following a review of focused key publications.

5.1. Green Productivity and Green Supply Chain

As explained in the Green Productivity and Green Supply Chain Manual (APO 2008), The Asian Productivity Organization (APO) has been promoting Green Productivity (GP) in the Asia-Pacific region since 1994. GP is now widely accepted as a holistic approach to tackle environmental issues and problems while simultaneously enhancing productivity, the foundation of business competitiveness.

“Greening supply chains” (GSC) refers to industries and enterprises requiring that suppliers and vendors take responsibility for meeting specific environmental requirements. GSC is part of the green procurement process, which is especially important for large and multinational enterprises that rely on many links in their supply chains for products and services. GSC not only strengthens customer-supplier relationships, but also reduces costs, leads to sustainable production and consumption, and provides potential opportunities to add value to businesses (APO 2008).

The Green Productivity (GP) concept, established by the Asian Productivity Organization (APO), aims for socioeconomic development with the ultimate objective of sustained improvement in the quality of human life. It also emphasizes environmental improvement combined with productivity enhancement and profitability. This concept ensures a structured and participatory approach to achieving goals, which can be utilized for a Green Supply Chain (GSC). Supply chain management is a very important factor that is directly related to productivity and business competitiveness.

These definitions are an emerging concept not only for the Asia and the Pacific region, but to the all suppliers’ countries, of which Latin-American and African countries must bring up to date.

APO 2008 publication also explains that in order to achieve sustainable development in the region, the creation of sustainable consumption patterns, the development of eco-products, and the adoption of ISO 14000 standards (which aim to reduce the environmental footprint of a business and to decrease the pollution and waste a business produces) would provide a framework for enterprises to practice green purchasing.

Regarding market interaction, an excerpt of APO 2008 publication explains that: Green Production is important in purchasing decisions, and developing new partnerships among enterprises will drive the green supply chain and enhance sustainable performance. "Greening the supply chain" refers to buyer industries and organizations requiring environmental responsibility and certain environmental standards in their suppliers' and vendors' business management systems and practices. These requirements are expected to be coherent with the buyer industry's core environmental policies and vision. In some cases, the buyer industry also provides technical and/or financial assistance to suppliers/vendors to help them meet these requirements.

Tropical producers working under this philosophy would have a powerful marketing tool into International Markets, where environmental and social issues are key factors to reach them. Therefore new market niches could be opened.

5.2. Green Building Codes

According to the U.S. Environmental Protection Agency and the American College of Allergy, Asthma and Immunology, Americans spend 90% of their time indoors. As a result of poor indoor air quality, toxic materials and other design attributes, many of the buildings where we live and work can have a negative impact on our health. Green building practitioners have embraced design methods to help mitigate these and other negative impacts. Examples include design methods that bring more of the outside environment inside through day-lighting, operable windows, better ventilation systems, and much more.

Explained by Metafore 2004 publication, Green building programs were established as guidelines that address many of the negative environmental, human health, and financial impacts of construction and occupancy of a building. A green building project involves an integrated design process where environmental, social, and economic issues are considered collectively to address a number of design and construction elements.

- Ecological sensitivity in site selection
- Consideration of future water use
- Incorporation of energy efficiency systems that anticipate future energy demands
- Systems and materials that enhance indoor air quality
- Use of materials that not only enhance indoor air quality, but limit harm to the environment or humans during the raw material extraction and manufacturing process

The appropriate use of wood products is commonly considered under both indoor air quality and materials selection sections of most green building programs.

Most green building programs, following Metafore 2004 Publication, are intended to transform supporting industries by creating incentives for using leading edge products and technologies with environmentally friendly components. Currently, wood-related credits in most green building programs address the quality of forest management behind specific wood products as well as the reduction of waste by reusing and recycling existing wood. It may well be that future iterations of green building programs offer points simply for using wood instead of other materials such as steel and concrete based on life-cycle criteria.

While there are many forest certification systems worldwide, the Forest Stewardship Council (FSC) certification system is recognized by the majority of green building programs and offers a CoC certification to track products through manufacturing and distribution to guarantee that a project owner receives the certified products that were requested.

As an example, the LEED (Leadership in Environment and Energy Design) program is a voluntary, national (U.S.) standard for developing high-performance, sustainable buildings. It was created by the U.S. Green Building Council to set a standard for environmentally friendly buildings and promote competition in the marketplace. This program provides a complete framework for assessing building performance and meeting sustainability goals.

The standard emphasizes state-of-the-art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. There are standards currently available for:

- New construction and major renovation projects
- Existing building operations
- Commercial interiors projects
- Core and shell projects

Regarding European Green Building Programme (launched in January 2005); it is one of the "Intelligent Energy - Europe" Programme. The goal is to substantially improve end-use energy efficiency and promote the use of renewable energy sources

According to Green Building Programme Partner Guidelines, V 2.2, March 2009 the Green Building Programme is a European Commission voluntary programme through which non-residential building owners and occupiers, being private or public organisations, are aided in improving the energy efficiency and to introduce renewable energy sources into their building stock.

In order to reach these niches, timber from Sustainable Managed tropical forests (SFM), and even if/when applying SFM may increase production costs, should be pro-actively being promoted and demonstrated at the markets in order to tap "Green Building Programme" niches, including for renewable energy.

Due to green building programs offer points simply for using wood instead of other materials such as steel and concrete based on life-cycle criteria, small scale certified producers in developing countries have here an special niche market where governmental support in the country of the end-user (EU, USA, Japan,...) is guaranteed and/or subject to (tax-) incentives.

5.3. Certification and Traceability

There are two elements related to certified wood products: forest management certification, and chain-of-custody (CoC) certification. Several and different forest certification schemes exist, and among the best known among companies that purchase forest products are: The Forest Stewardship Council (FSC) which is an international system that certifies operations worldwide. The Sustainable Forestry Initiative (SFI) is a certification system targeting industrial forestry operations in Canada and the Programme for Endorsement of Forest Certification schemes (PEFC). For more information on ongoing certification schemes see at <http://www.fao.org/DOCREP/003/X6720E/X6720E00.HTM>.

When certification was first employed more than 10 years ago, many companies along the forest products supply chain viewed certification as an opportunity for direct economic benefits. The conventional wisdom at that time assumed that the end-use consumer would be willing to pay more for a product certified as coming from a well-managed forest. In practice, only a small segment of end-use consumers in the U.S. are actually willing to pay more for environmentally-preferable products such as certified forest products. (Murphy, C., 2003. "The Next Big Thing," *Fortune Small Business*, Vol. 13, No. 5 June 2003. Time Inc. New York, N.Y.)

As described by Metafore 2004 report, Forest management certification is a process where forests are evaluated according to a set of standards, guidelines, and principles established by a certification body, and are certified as well-managed by an independent third-party auditor (or certifier). Once the forest has been awarded a forest management certification, the landowner can sell logs as certified under that specific certification system.

In addition, some certification systems require that logs be sold to manufacturers that are CoC certified if the products are to be labelled as certified. Chain-of custody certification is an inventory control audit that requires certified materials to be inventoried and tracked separately from non-certified inventory. To ensure that the product is not mixed with non-certified materials, each step in the manufacturing and distribution chain needs to be CoC certified.

CoC certification provides assurance to architects, contractors, and project owners that any products requested as coming from a certified well-managed forest have in fact moved through a certified chain from a certified well-managed forest (Metafore 2004).

Considering that European markets requirements for tropical woods are expected to be more rigorous concerning SFM; furthermore, US new administration seems to move toward environmental challenges, therefore certification is a key issue to take into consideration. Suppliers should in a midterm period demonstrate good forestry practices in order to reach main markets. Countries which not accomplish this key factor would remain backwards.

By 2005 situation of forest was as follows:

Figure 3o.1

Global summary of management status in the tropical PFE												
	PFE ('000 hectares)											
	Production							Protection			All	
	Natural				Planted			Total area	With management plans	Sustainably managed	Total area	Sustainably managed
	Total area	With management plans	Certified	Sustainably managed	Total area	With management plans	Certified					
Africa	70,461	10,016	1,480	4,303	825	488	0	39,271	1,216	1,728	110,557	6,031
Asia & the Pacific	97,377	55,060	4,914	14,397	38,349	11,456	184	70,979	8,247	5,147	206,705	19,544
Latin America & the Caribbean	184,727	31,174	4,150	6,468	5,604	2,371	1,589	351,249	8,374	4,343	541,580	10,811
Total	352,565	96,250	10,544	25,168	44,778	14,315	1,773	461,499	17,837	11,218	858,842	36,386

Source: Status of Tropical Forest Management 2005. ITTO

Main aspects to fulfil certification criteria's are: low environmental impact on forest, socially helpful for communities and economically viable; then producers should balance these issues in order to achieve the certification.

5.4. EU Action Plan for Forest Law Enforcement, Governance and Trade

The Environmental Resource Management (ERM) 2004 publication describes the FLEGT plan as follows:

In response to growing global concerns regarding illegal logging and a series of international initiatives such as the G8 Action Plan on Forests, the EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) was developed in May 2003 and approved by the Council in October 2003. The Action Plan provides a strategic process and package through which the EU proposes to address the growing problem of illegal logging. The aims of the Action Plan are to:

- Reduce the amount of illegal timber in trade (it is currently not illegal in the EU to import illegally produced timber products);
- Reduce the amount of illegal timber consumed; and
- Reduce the scale and significance of illegal logging activities, currently prominent in some key producing countries.

Given the complexities of developing a multilateral agreement the Action Plan focuses on bilateral or regional actions. The Action Plan comprises the following sets of activities:

- Development cooperation – with a focus on capacity-building and institutional strengthening;
- Trade in timber – primarily through the application of legality licences;
- Public procurement;
- Private sector initiatives – the encouragement of voluntary initiatives; and
- Financing and investment safeguards.

Furthermore the publication explains that a key component of the Action Plan is the application of the legality licensing system to identify legal products in partner countries and license them for import to the EU, with unlicensed products being denied entry. However, the overall aim is for the legality licensing scheme to be applied through voluntary bilateral agreements between the EU and the partner producer country. Initially the legality licence

will be applied to only a limited range of products – logs and rough sawnwood – but this will be gradually extended to include other wood-based products.

Following the production of the draft findings of this and other research the coverage of the legality licence was extended to include plywood and veneer.

The licence will be applied at a national level in the producer country. It will be implemented in the EU by a new regulation to be developed and applied at the EU level. In addition the development of new legislation is being considered that will make it illegal to import illegally produced timber products into the EU, from any source, including producer countries which do not join the licensing scheme.

Imports to the EU of logs and sawnwood from countries not in the partnership agreements would not be required to have a legality licence, as this system would only apply to those producer countries which have negotiated an EU FLEGT Voluntary Partnership Agreement (VPA). The impact on trade could therefore create global trade distortions, creating the potential to trigger market substitution in the global trade.

Furthermore for those countries which are members of the VPA; they could have some benefits, like exclusive markets to their products with low competition on similar niches from others (non-VPA producers) among others, but it is not yet clear if their extra efforts would be rewarded by a premium price.

5.5.E-commerce & E2Commerce

Actual trends of e-commerce show their relevance and need to better analyze it as a factor to reach markets in a competitive way by tropical producers. Growth expectations vary depending on market maturity and the characteristics of the country.

Considering that in Europe, “among retailers, the cross-border potential of e-commerce seems not to be exploited: 51% of EU27 retailers sell via the internet, but only 21% are currently conducting cross-border transactions, down from 29% in 2006 (in the EU25). The same proportion (21%) advertises cross-border (Report on cross-border e-commerce in the EU 2009).

In France, Germany and the UK, as explained by the Forester Research 2009, e-commerce is expected to increase in the coming 6 years though actual economic crisis. France would be the country with the most high rate increase, it is predicted that each French will expend until 2014, in average 932 euro on line per year, 994 euro and in Germany 1703 euro respectively. (Forester Research 2009).

E-commerce is now a widespread phenomenon in the UK, Germany, France, and the Nordic countries, which also enjoy higher levels of cross-border e-commerce than average. This suggests an underlying potential for cross-border e-commerce as other economies catch up. (Report on cross-border e-commerce in the EU 2009)

According to the Forester Research 2009, customers will search for different key aspects, such as final price, transportation costs and delivering times. Factors to pay attention to are also promotion, product availability, trust, website performance, product information and ease of payment transaction.

Regarding China, the e-commerce development is a step behind compared to the European countries and the U.S. The lack of policies to develop informatics issues has been the main reason of China’s delay (Massa 2007).

Figure 5o.1

	Acheteurs en ligne (en millions)			Revenu total dépensé en ligne (en milliards d'Euros)			Revenu moyen dépensé en ligne par personne (en Euros)		
	2008	2014	Variation	2008	2014	Variation	2008	2014	Variation
France	18	30	71,4%	14	28	100,0%	781	932	19,3%
Allemagne	36	44	22,2%	28	44	60,0%	869	994	14,4%
Royaume-Uni	28	37	32,1%	42	63	50,0%	1 500	1 703	13,5%

Source : Forrester Research, Inc

Source: Forester Research 2009

Regarding E2Commerce, the Report of the APO Forum on B2B Cooperation on “E2Commerce” 2003 defines and explain this concept as follows.

In the paper by Dinesh Jain E2Commerce is defined as “the buying, selling and delivery of goods and services, using electronic media so as to upkeep the totality of relations between humans and the natural environment” (quoted in APO 2003).

Being able to communicate in real time across the entire supply chain of a product system will result in better utilization of resources and energy. This will not only reduce cost but also to enhance the productivity, quality, and environmental performance through a continuous flow of information by the use of internet

Aspects to take into consideration to achieve E2commerce are:

- E-commerce is the potential rapid and integrated information-sharing within the supply chain.
- Potential decrease in resource utilization as e-commerce reduces the need for more traditional infrastructure and operation needs of commercial activities.

The trend towards integration of the supply chain through e-commerce is progressing rapidly. E2Commerce has the potential to help businesses raise their productivity and green the supply chain gaining a powerful marketing tool.

6. Conclusions

- 6.1. Tropical timber raw material (logs and sawnwood) trade trends are decreasing at major markets analyzed (except China). Consumption is closely linked to the Construction sector
- 6.2. Decreasing log exchanges and increasing trade in processed products have changed the way wood is transported
- 6.3. Of all the traditional products (logs, sawnwood, furniture), the tropical plywood trade has remained more or less stable, trends show it will remain that way; nevertheless, competition with cheaper raw materials is menacing these products
- 6.4. Competitiveness of tropical wood products vis a vis temperate lumber and other materials (steel, plastic) is decreasing (some more than others) and is expected to decrease further. However new niche markets, such the Green building guidelines supported by government (tax) incentives can offer new opportunities for tropical wood producers.

7. Recommendations

Update and get more data in the German, British and Swedish market (consumption, requirements, market segmentation, etc) is essential to complement this report, and by considering the impact of global crisis.

It is helpful to look at the demand growth in order to predict some movements in future's consumption; however it is also important to analyze main suppliers' countries where the raw material comes from, such as Brazil, or Malaysia; and in transit processing countries like China and Vietnam.

E-commerce represents a great opportunity to open new market niches where international free trade agreements permits the movements of goods without restriction (NAFTA and the EU). This is a new practical way to reach cross-border customers in these countries. An analysis on the impact of (cross-border) E-commerce on the tropical timber trade would be relevant to identify trends and opportunities for new market niches.

The impact of the FLEGT initiative on tropical timber products would facilitate further analysis of competitiveness. New and updated trade data of actual VPA countries related to their exchanges during the last 5 years would help clarify or identify emerging trends.

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