

EFORWOOD
Tools for Sustainability Impact Assessment

Report by INCO partners on selected policy changes in TWC and Europe

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Preface

This report is a deliverable from the EU FP6 Integrated Project EFORWOOD – Tools for Sustainability Impact Assessment of the Forestry-Wood Chain. The main objective of EFORWOOD was to develop a tool for Sustainability Impact Assessment (SIA) of Forestry-Wood Chains (FWC) at various scales of geographic area and time perspective. A FWC is determined by economic, ecological, technical, political and social factors, and consists of a number of interconnected processes, from forest regeneration to the end-of-life scenarios of wood-based products. EFORWOOD produced, as an output, a tool, which allows for analysis of sustainability impacts of existing and future FWCs.

The European Forest Institute (EFI) kindly offered the EFORWOOD project consortium to publish relevant deliverables from the project in EFI Technical Reports. The reports published here are project deliverables/results produced over time during the fifty-two months (2005–2010) project period. The reports have not always been subject to a thorough review process and many of them are in the process of, or will be reworked into journal articles, etc. for publication elsewhere. Some of them are just published as a “front-page”, the reason being that they might contain restricted information. In case you are interested in one of these reports you may contact the corresponding organisation highlighted on the cover page.

Uppsala in November 2010

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EFORWOOD
Sustainability Impact Assessment
of the Forestry - Wood Chain



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1 Summary and synthesis: The EU wood chain in a globalised world – impact of trade and policy factors for sustainability of wood chains between the EU and developing countries

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1.1 Introduction

In a globalised world the EU and its forestry sector are not isolated, but through trade and policies depend on and influence forestry sectors in other regions. The increasing world population in combination with increasing wealth of larger parts of this population (e.g. Hilderink et al. 2009) will lead to ever increasing worldwide demand for wood (Arets et al. 2008). As a result of this increasing demand in combination to competition for land for production of other commodities like soy and palm oil, pressure on forests will continue to increase, especially so in tropical regions (e.g. Arets et al. 2010, ten Brink et al. 2007, van de Berg et al. 2010).

With the aim of promoting sustainability of wood from tropical regions the EU launched an action plan to restrict the amount of illegal timber entering the EU (EU action programme for Forest Law Enforcement, Governance and Trade - FLEGT), while a number of member states are putting into effect stricter timber procurement policies focused towards certification. At the same time the wood demand from some developing giants like China and India is increasing, which will likely have a strong effect on trade between the EU and developing countries.

The focus of this study is on the forestry wood chains in developing (mostly tropical) countries. For three regions, South America, Africa and South-East Asia separate assessments have been carried out. In this report the results from these regional studies are compiled and integrated to give a global perspective. Chapter 2 gives the results for South America and the Caribbean and Chapter 3 gives the results for Africa, with a focus to West and Central Africa. The assessment for South-East Asia is reported in a separate report (CIFOR 2008).

Additionally more detailed assessments were made about the potential impact of stricter EU regulations considering the EU-FLEGT Action Plan and the public procurement policies that are increasingly demanding for forest certification (Chapters 4).

In all regions the EU-FLEGT Action Plan to halt illegal logging, stricter EU public procurement policies in combination with generally increasing demand for certified wood and climate policies to reduce emissions from deforestation and forest degradation are indicated to be among the most important policies having an effect on tropical forestry wood chains. Below a summary will be given per region, while issues concerning FLEGT, certification and stricter procurement policies will be addressed more specifically.

1.2 Trade between EU and tropical countries

In 2005, the EU imported approximately 42 million r.e. m³ of wood and wood products from Latin America and the Caribbean (23.7 million r.e. m³), African (7.6 million m³) and South-East Asia (10.5 million m³). This covers 9.3% of all EU imports of wood products both from outside the EU and inside the EU (Figure 1.1, 2005 data adapted from the EFI/WFSE Forest Products Trade Flow Database, Michie and Philip 2002).

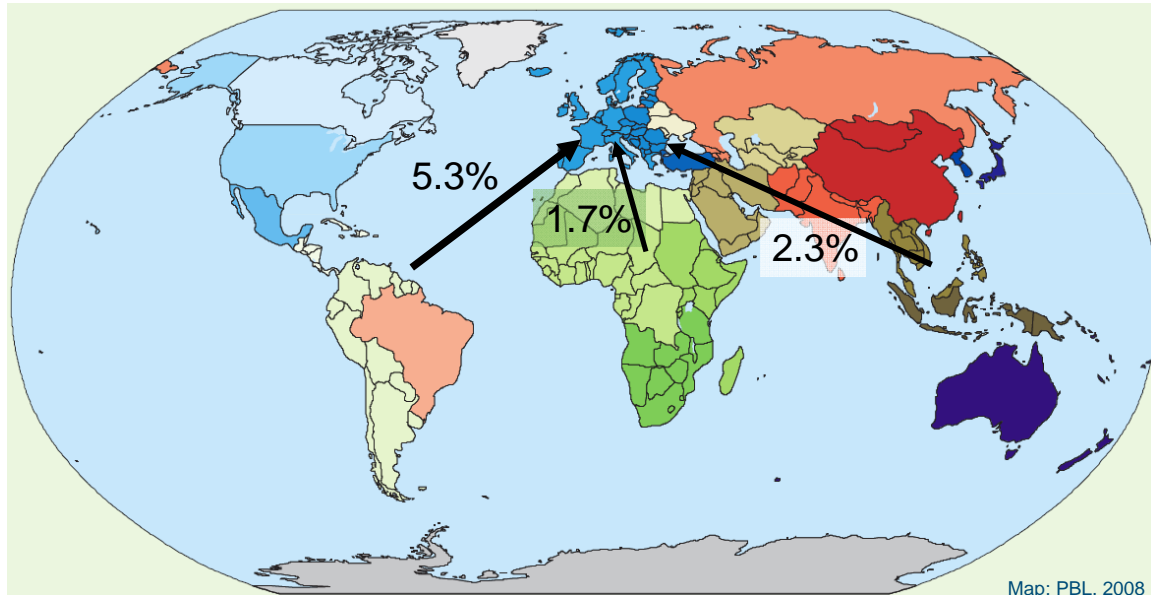


Figure 1.1. Import of wood & wood based products from America, Africa and South-East Asia into the EU as percentage of total EU imports. (2005 data adapted from the EFI/WFSE Forest Products Trade Flow Database, Michie and Philip 2002).

Today, Europe represents a very limited part of the world consumption of tropical timber: less than 1% of the world tropical logs consumption, and respectively less than 7 and 6% of tropical sawn timber and plywood world consumptions. The volume of logs and plywood consumed by Europe is decreasing since 1998, and stabilising in the last years. Meanwhile, the European consumption of sawn timber is fluctuant but not declining, because it is mainly based on some specific technical requirements which only some tropical species can fulfil (see Chapter 4).

1.3 Latin America and Caribbean

Chapter 2 gives a detailed description of trade and policy factors in the EU and Latin America and Caribbean (LAC) countries that influence each others forestry wood chains. In the region still large areas are under forest cover while at the same time the area of forest plantation increases. Yet the LAC region contributes little to international trade. In Brazil for instance more than 80% of total wood production is consumed domestically. Only four LAC countries (Brazil, Chile, Argentina and Uruguay) show a positive wood products trade balance, while most countries, although having a large forest resource import more wood products than they export. Except for round wood exports from Uruguay to Spain, only Brazil and Chile contribute significantly to LAC exports to Europe.

Although also in LAC countries illegal logging is widespread, currently there are not yet formal negotiations with LAC countries towards VPA's. Reduction of illegal logging and associated likely price increases will probably mainly affect national markets as that are the most important destination of the locally produced timber. Currently the LAC region is quite

well on track with adoption of forest certification, with more than 11 million hectares certified under the FSC scheme (see also Table 1.1), which is more than half of all certified tropical forests.

1.4 Africa

Chapter 3 gives a detailed description of trade and policy factors in the EU and African countries that influence each others forestry wood chains. In many African countries the input of the forest sector to the national economies is substantial, ranging from 1 to 10% while the forest industry is an important source of income in remote areas. Currently widespread illegal logging is among the major issues for African forestry and forest conservation, and in their relations to European customers, certification becomes a major goal for more advanced forest companies in Africa. Yet, adoption of certification is rather slow in most African countries. The high initial costs incurred with certification also divert exports to other regions with lower environmental requirements than the EU. This translates in strongly increasing export of mainly logs to China. The subsequent value adding then happens in China, after which processed products are again exported to the EU.

With quickly decreasing natural forest cover in western and central Africa, forest plantation will become increasingly important to meet future demand for wood from Africa.

One of the most important trends, however, is the increasing impact of China and other Asian countries on trade flows. The share of total exports of wood from Africa to China has increased from 5% in 1995 to more than 30% in 2005.

1.5 South-East Asia

Also a regional study for South-East Asia (CIFOR 2008) was carried out within the EFORWOOD project. In a separate report (CIFOR 2008) a detailed description of trade and policy factors in the EU and South East Asian (SEA) countries that influence each others forestry wood chains is given. In 2006 the value of wood products imported by the EU was approximately three times higher than that of EU exports to the region. Tropical logs, furniture, paper, pulp mouldings and joinery are among the key imports by the EU, while the export of paper products covers the majority of EU exports to SEA. Within the region Indonesia, Malaysia and Viet Nam are the most important trade partners.

Next to Europe, also China is a key trading partner for SEA countries, with roughly 40% of China's forest product imports coming from the Asian Pacific region. For most countries in the SEA region China currently is the most important buyer of logs. Next to SEA also Russia is a key supplier of logs to China. Recently Russia announced, however, to increase export duties on Russian logs to enhance domestic value adding in Russia. In 2008 this duty has been increased to 25% of the export value, while in 2009 this would increase to 80% of the export value. Such increase would probably strongly increase demand Chinese demand for SEA logs. Currently, however, this raise to 80% is delayed at least until 2010, while further delays are anticipated.

Between 1990 and 2005 the forest cover in most SEA countries has strongly decreased. Over the same period the volume of wood removals declined by 35% and estimates in CIFOR (2008) indicate that the natural forest resources in the Asian Pacific region may be depleted within the next 20 years if timber supply remains at current levels. This declining resource

base will likely significantly impact on wood product flows from SEA to the EU and other markets.

The top 5 most important market and policy factors that may impact the flow of wood between South-East Asia and the EU are likely to be (CIFOR 2008):

1. Declining natural resources availability in South East Asia, and implementation of associated Sustainable Forest Management (SFM) policies;
2. Continued increase in demand for wood products by China;
3. Increased log export duties in Russia;
4. Implementation of REDD mechanism under the Kyoto Protocol; and
5. Timber procurement policies and certification.

The first four market and trade factors will constrain South East Asia's ability to supply wood products to the EU; either due to resource constraints; diversion of wood products to competing markets; or production of other non-timber values such carbon. The final factor will constrain the EU's demand for wood products from South East Asia.

There is an interaction between the influence of these key market and policy factors. For example, if China significantly increases demand for South-East Asian wood products; then there may no longer be sufficient resource to maintain exports to the EU. This may minimise the effect of EU timber procurement policies and certification, as wood flows would have already been diverted from the EU to China.

Three of the top five factors are international policies or trade factors. They could potentially affect all timber producing countries, not just South East Asia or the EU. Policy-makers in either region are less able to directly influence these factors, as they are part of multi-lateral trade and forest policy negotiations.

Policy makers in South-East Asia have a direct influence over implementation of sustainable forest management (SFM) policies, which affect long term natural resources availability in South East Asia. With the strongly reduced natural resource base, decisions to implement SFM policies can reduce export quantities to the EU and other markets in the short term, but in the long term they are more likely to maintain wood production and export from the region.

Because the supply of wood products from the EU to South East Asia is so much smaller than in the opposite direction; policy makers in the EU mainly influence trade between the two regions through policies to regulate demand for wood products from South East Asia, rather than by policies to regulate their own supply of wood products. Therefore the EU should be aware of the potential for their procurement policies to divert trade from South East Asia to less environmentally stringent markets. This emphasises the importance of global efforts to pursue SFM and coordinate international timber procurement policies.

1.6 Certification, stricter public procurement and FLEGT

1.6.1 Certification and stricter public procurement

The world wide demand for wood from sustainably managed forests is greatly increasing. Public sector procurement of wood based products, ranging from wood for construction purposes to paper used, covers an important share of total wood consumption in developed

countries. A small number of EU countries, including Belgium, Denmark, France, Germany, the Netherlands, Norway and the United Kingdom, have now developed public procurement policies to ensure that only legally and sustainably produced wood is sourced for government purchases, while a number of other EU member states are considering implementing similar policies. The European Commission has set legality as the minimum requirement for its policy of green procurement. Outside the EU, also Japan and New Zealand have strict public procurement policies to ensure sustainability of publicly sourced wood based products.

The governments of Denmark, the Netherlands and the United Kingdom (UK) have developed a set of criteria for legality and sustainability (e.g. CPET 2010, TPAC 2008) against which certification schemes are assessed by independent committees (e.g., Central Point of Expertise on Timber Procurement, CPET in the UK, and Timber Procurement Assessment Committee, TPAC in the Netherlands). Other countries have implemented a less strict assessment of certification standards and approved the main certification schemes, like FSC and PEFC.

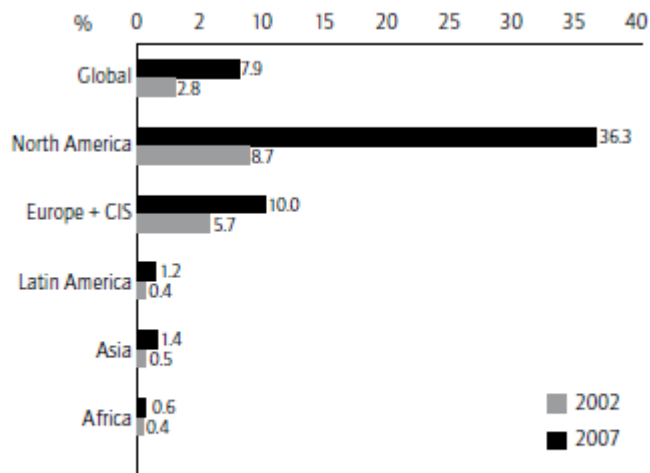
During recent year voluntary certification and labelling schemes like FSC and PEFC have set the standard for sustainable forest management (Auld et al. 2008). Globally in 2007 8% (306.3 million ha) of all forests were certified. This is almost a tripling of the area that was certified in 2002. Also the area of certified forests in developing countries is increasing, but yet still strongly lags behind certified area in temperate regions. In 2006 tropical countries accounted for approximately 7% of all certified forest area (0.6% in Africa, 1.2% in Latin America and 1.4% in Asia) contributing to 6% of the total production of certified wood. Most certified forests are in forest concessions as part of large Forest Management Units (FMU) and only 14% of the certified tropical forests is owned or managed by local communities (Purbawiyatna and Simula 2008).

Many different certification schemes are currently in use. There are many different national certification schemes and two important global schemes that include national certification standards (FSC and PEFC). Where FSC is a an environmental NGOs led initiative that provides certification through centralised standards and an accreditation system, the PEFC is set up by producers and is a system of mutual recognition of several national certification schemes (Auld et al. 2008, Purbawiyatna and Simula 2008). Of all certified forests in 2007, 65% was PEFC certified, 28% was FSC certified and the remaining 7% was certified under a national standard like the Programa Brasileiro de Certificação Florestal (CERFLOR) in Brazil, the Indonesian Ecolabelling Institute (LEI) in Indonesia and Malaysian Timber Certification Scheme (MTCS) in Malaysia (Purbawiyatna and Simula 2008). In May 2009 this latter scheme, however, was endorsed under the PEFC, becoming the second tropical national standard (after the Gabonese Forest Certification Scheme) to be endorsed under PEFC. It is important to note that the majority of the certified forests in the tropics carry the FSC certificate.

Chain of Custody (CoC) certificates include the processing industry and thus cover the whole chain from forest to consumer; ensuring certified products are not mixed. They are important to ensure producers eventually can sell the wood using the certification logo's and thus can claim the price premium. If for instance FSC certified wood is sawn in a non-certified saw mill, the processed wood is not eligible to carry the FSC logo. Currently, however, these CoC certificates stay behind the shares of certified forests in tropical regions (Purbawiyatna and Simula 2008). In this respect it is also important to engage the important transit and processing countries in Asia, i.e. in particular China, to certify the supply chains. Recently, however, FSC awarded a substantial number of new CoC certificates to companies in Asia, notably Japan and China (Auld et al. 2008). Yet, if CoC certification doesn't follow the trend

of forest certification eventually not the availability of certified wood, but availability of certified processors may become the limiting factor for increasing the share of certified wood products in the international wood market.

The potential round wood supply from certified forests amounts up to 405 million m³, about a quarter of the total global wood supply (Purbawiyatna and Simula 2008). Much of this, however, enters the market without reference to the certificate. Likely this already reflects the gap between forest certification and CoC certification.



Source: Indufor

Figure 1.2. Percentages of forest certified by region in 2002 and 2007 (from Purbawiyatna and Simula 2008)

The price premium on certified wood, is not always the main reason for certification. Certified logging companies will generally at least temporarily have solved both environmental and social problems. Solving these problems may require greater investments than they made prior to certification, but in the end it may prevent interruptions in harvesting operations, which could become much more expensive. A recent survey showed, for instance, that Brazilian logging companies implement certification systems not mainly because of an anticipated price premium, but rather because of improved market access and improved image (Araujo et al. 2009). The certified companies in the survey also indicated that improved forest management resulting in improved performance was an important reason to continue certification.

Latin America has the largest area under forest management of the tropics, with over 11 million hectares certified under the FSC scheme, with more than half of it in Brazil (Table 1.1, FSC 2008). In Brazil, 2.8 million hectares are natural or mixed forests and 2.3 million hectares are plantations (43% of the total plantation estate according to the estimate of WRI 2005). In Peru, companies harvesting natural forest have been looking for certification in order to secure their access to international markets and with the expectation to be able to increase their exports. Even if only a small portion of their market demands certified timber or timber products it appears to be attractive for them to seek FSC certification: it improves their image, in Peru it reduces their cost of harvesting rights by 25%, and it basically expands their market access. In addition, currently it is the only reliable way to be able to show compliance with CITES II requirements for mahogany (even though the government and CITES are still debating other means).

In 2007, a total of 70,385 m³ of MTCS-certified timber products was exported from Malaysia to 17 countries (of which 9 EU member states), i.e. The Netherlands, Belgium, Germany, the United Kingdom, France, Australia, Greece, Denmark, Poland, Italy, Norway, Indonesia, South Africa, South Korea, United States of America, Japan and Mauritius. The United Kingdom was the biggest market for MTCS-certified products in 2007, accounting for 30,561 m³ (or 43.4%) of the total quantity exported. The Netherlands remained the biggest market overall, accounting for 97,499 m³ (or 48.4%) of the total quantity exported since the certificate was first issued in July 2002. The certified products cover a wide range including sawn timber, moulding, laminated finger-jointed timber, plywood, furniture and furniture components, picture frames, flooring, and door and window components (MTCC annual report 2007). In 2005 85% of the wood produced in China was from plantations. The other 15% are from clear cut, which in China probably is not certified. This would mean that all certified wood from China is from plantations.

Table 1.1 Global FSC certificates by area (ha) and number of certificates in (sub) tropical developing regions (source: FSC 2008) in April 2008. Regions covered: South America & Caribbean (SAC), Oceania, Asia and Africa.

Country	Region	Area(ha)	No
Argentina	SAC	231,126	12
Belize	SAC	104,888	1
Bolivia	SAC	1,727,104	17
Brazil	SAC	6,184,118	70
Chile	SAC	321,513	14
Colombia	SAC	58,749	3
Costa Rica	SAC	58,772	20
Dominican Republic	SAC	1,000	1
Ecuador	SAC	32,047	4
Guatemala	SAC	509,425	13
Guyana	SAC	371,681	1
Honduras	SAC	53,209	5
Mexico	SAC	658,864	37
Nicaragua	SAC	40,775	4
Panama	SAC	10,598	8
Paraguay	SAC	2,705	3
Peru	SAC	628,385	9
Uruguay	SAC	407,365	28
Venezuela, Bolivarian Republic of	SAC	139,650	1
Total	SAC	11,541,973	251
Papua New Guinea	Oceania	39,892	2
Solomon Islands	Oceania	39,402	1
Total	Oceania	1,624,973	31
China	Asia	589,897	11
India	Asia	644	1
Indonesia	Asia	903,020	7
Korea, Republic of	Asia	71,932	3
Laos	Asia	44,985	2
Malaysia	Asia	49,692	4
Nepal	Asia	14,086	1
Sri Lanka	Asia	17,948	4
Thailand	Asia	6,221	3

Viet Nam	Asia	9,904	1
Total	Asia	1,974,650	59
Cameroon	Africa	482,110	3
Congo, The Republic of	Africa	296,000	1
Kenya	Africa	1,825	1
Morocco	Africa	20,270	1
Mozambique	Africa	71,061	2
Namibia	Africa	219,623	3
South Africa	Africa	1,597,439	22
Swaziland	Africa	86,874	2
Tanzania, United Republic of	Africa	15,560	1
Uganda	Africa	112,100	1
Zimbabwe	Africa	108,431	3
Total	Africa	3,011,293	40
Grand total	All	18,152,889	381

1.6.2 FLEGT

Mainly in response to public concerns about negative social and environmental impacts of large scale illegal logging in tropical countries, in 2003 the European Commission (EC) adopted an action plan for Forest Law Enforcement, Governance and Trade (FLEGT). The aim of this is to halt the imports of illegal wood and wood products. The mechanism works through voluntary partnership agreements (VPA) between the EC and selected tropical producer countries. The plan further provides for governance reforms and capacity building in these VPA countries. The EU has been negotiating VPA's with Cameroon, Ghana, Congo, Indonesia, Malaysia and Viet Nam, while also other countries like Brazil, Bolivia, Liberia, and Gabon have expressed interest in developing voluntary agreements. The first agreements now have been signed with Ghana and Congo.

In a recent modelling study Moiseyev et al (2010) show that implementation of the voluntary partnership agreements with the 6 countries will result in a reduction of harvests in these countries by 20%, while harvest in other countries with medium to high risk of illegal logging will increase by 2.5%. Due to the large extent of illegal logging in the VPA countries, in combination with the anticipated difficulties to substitute the illegal supply with legal supply from well managed forests, industrial round wood log prices in these countries is expected to strongly increase by up to 70%, which will have a strong negative effect on local wood based industries and production for the local market. In turn, the impact on the EU and other countries is expected to be rather limited since these partner countries only have moderate trade with the EU (Moiseyev et al 2010). Such disruption of local markets may make it difficult to effectively implement the VPA as locally illegal logging may continue and even increase (Arets et al 2010).

1.6.3 Potential side effects

Stricter procurement policies in the EU and demand for stricter law enforcement under the FLEGT Action Plan may in some cases result in diversion of trade from tropical countries to other markets that are less stringent. With implementation of new stricter regulations it will thus be important for the EU not to overplay its hand, as this at the end may divert illegal trade to other places (Chapter 4).

1.7 Conclusions

The EU appears to be a relatively minor trade partner for most tropical regions, except some specific countries that have historical ties with European countries and a few big timber companies installed in the tropics, with European shareholding. At the same time, Brazilian, Indian, and especially Chinese consumptions are still exponentially growing.

Currently the rate of uptake of certification in especially SEA and African countries is rather slow, while South American countries appear to be better on track with implementation for forest certification. With the growing demand for wood from certified sources or with certified proof of origin/legality as demanded under the FLEGT programme, the access of SEA and African wood to the EU market may be altered. However, since the EU is a relatively small market for tropical wood and because market access for non-certified timber seems to be rather unrestricted outside of western markets, the increasing EU demand for certified wood may divert the wood trade to other countries with a high appetite for wood, like for instance China and India.

Diversion of trade of non-certified wood to for instance China may be further amplified by the increasing demand for wood from China, especially so if Chinese imports from Russia will be reduced under increasing Russian export duties. This potentially will further level down the relative importance of the European market for tropical timbers at a world scale, with the risk that any positive impact of the European stricter regulations be outnumbered by other pressures on the markets of these countries.

However, also other countries/regions tend to follow in implementing stricter demands for imported wood and, like for instance China, start looking internally towards better management. Europe in that sense, is leading by example. An important issue that needs to be addressed would be how FLEGT and environmental regulations relate to imported timber and paper products, not just to roundwood. Because if final products can be included that are produced elsewhere than the countries the timber is coming from, the eventual effects on forest management could be much greater.

Additionally, effects are likely to be bigger than the small percent of timber that would be directly affected by the regulations. Even if a company only sells 5% of its timber to Europe or another responsible buyer (requesting certified or legal timber) it would mean that the producer will have to become more transparent over a much greater part of its operations. Because the whole chain needs to become transparent to be able to sell certified wood, in China an increasing number of processing plants have FSC certified their chains of custody (Auld et al. 2008), mainly to be able to serve the European and US markets. In Brazil exists an increasing internal demand for certified timber, and in other South American and Asian countries timber buyers begin to commit themselves to responsible buying policies. Finally, some countries feel the pressure from Europe to work towards a more transparent timber industry. Even with only a small volume of timber being exported to Europe and the USA, this usually amounts to a considerable percentage of the total production value and loosing that market may have serious influence on the local markets, dumping the better quality timber for low prices, reducing profitability of everyone (see for example the mahogany export ban in Bolivia in the late eighties, effect of discussion on mahogany export ban in Peru in 2005/6). As a result, governments are looking for increased monitoring capabilities and some companies look for independent means of verification of origin to secure access to European and US markets.

Yet, if not addressed properly, the stricter European regulations could accelerate the disconnection of Europe and of the world tropical timber economy. Stricter regulations from EU side will probably only result in more sustainable wood being produced if accompanying actions are implemented to solve the problems of poverty, to promote economic development, and reduce comparative disadvantages for small scale producers.

1.8 References

- Araujo, M., S. Kant, and L. Couto (2009). Why Brazilian companies are certifying their forests? *Forest Policy and Economics* 11:579-585.
- Arets, E.J.M.M., T. Palosuo, A. Moiseyev, G.J. Nabuurs, D. Slimani, C. Olsmat, J. Laurijssen, B. Mason, D. McGowan, D. Vötter. (2008). Reference futures and scenarios for the European forestry wood chain. Deliverable 1.4.7 of EC FP6 project EFORWOOD.
- Arets, E.J.M.M., S. van Berkum, C. van Oosten, P.S. Bindraban, R.E.E. Jongschaap, E. Stehfest, N. Rozemeijer, V. Geissen, R. Hessel, O.M.C. van der Valk and A. de Jager (2010 – in press). Competing claims on natural resources review study. Alterra Report. Wageningen, The Netherlands.
- Auld, G., L. H. Gulbrandsen, and C. L. McDermott (2008). Certification Schemes and the Impacts on Forests and Forestry. *Annual Review of Environment and Resources* 33:187-211.
- CIFOR (2008). Impact of Policies on Trade of Wood Products Between the EU and South East Asia - Draft report. Centre for International Forestry Research, Bogor, Indonesia.
- CPET (2010). UK Government Timber Procurement Policy: Definition of legal and sustainable for timber procurement, Fourth Edition. Central Point of Expertise on Timber Procurement, Oxford, United Kingdom.
- FSC (2008). Global FSC certificates: type and distribution - April 2008. Presentation. Forest Stewardship Council (FSC).
- Hilderink, H., P. Lucas, and M. Kok (2009). Beyond 2015: Long-term development and the Millennium Development Goals. Netherlands Environmental Assessment Agency (PBL), Bilthoven, the Netherlands.
- Michie, B. and W. Philip (2002). EFI/WFSE Trade Flow Database General description. European Forest Institute, Joensuu, Finland, 2000. Updated 2002.
- Moiseyev, A., B. Solberg, B. Michie, and A. M. I. Kallio (2010). Modeling the impacts of policy measures to prevent import of illegal wood and wood products. *Forest Policy and Economics* 12:24-30.
- Purbawiyatna, A. and M. Simula (2008). Developing forest certification - Towards increasing the comparability and acceptance of forest certification systems. Technical Series 29. International Tropical Timber Organization (ITTO), Yokohama, Japan.
- ten Brink, B., J. R. M. Alkemade, M. Bakkenes, J. Clement, B. Eickhout, L. Fish, M. de Heer, T. Kram, T. Manders, H. van Meijl, L. Miles, C. Nellemann, I. Lysenko, M. van Oorschoot, F. Smout, A. Tabeau, D. van Vuuren, and H. Westhoek (2007). Cross-roads of Life on Earth: Exploring means to meet the 2010 Biodiversity Target. CBD Technical Series No. 31. Secretariat of the Convention on Biological Diversity and Netherlands Environmental Assessment Agency, Montreal, Canada.
- TPAC (2008). Dutch Procurement Criteria for Timber - Principles and criteria for: Sustainable Forest Management (SFM); Chain of Custody and logo use (CoC); Development, Application and Management of certification systems (DAM). Timber Procurement Assessment Committee, Den Haag, the Netherlands.

van den Berg, J., E. J. M. M. Arets, S. van Berkum, B. Harms, B. Kamphuis, and C. Verwer (2010 (in press)). International trade chains and biodiversity. The impacts of palm oil, tropical timber and soy chains on biodiversity. LEI, Wageningen UR, Den Haag, The Netherlands.

2 The forest wood chain in Latin America and the Caribbean region

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2.1 Trade of wood and wood based products between Latin America and the Caribbean and Europe

In spite of enormous areas still under natural forest (861 million hectares, FAO 2005a) and a steady increase in plantation area (in 2005 reached the 13 million hectares, FAO 2005a) the Latin American and Caribbean (LAC) region contributes relatively little to international trade. In 2003 only four countries had a positive wood products trade balance (Brazil, Chile, Argentina and Uruguay) while Mexico, Colombia and Ecuador have large forest resources, contribute to international trade, but the value of wood products imported is much greater than that of the products exported (FAO 2005b). At an international level, Latin America does not play an important role in trade. In 2003 none of its countries appeared on the top ten list of importers and exporters, as a continent exporting about 5 billion US\$ worth of wood products (4% of world's total export of such products), about the same as the Russian Federation exported that year by itself, and imported about 3 billion US\$ worth of forest products (2%), less than Belgium or The Netherlands by themselves. Most of these exports came from Brazil and Chile, while most of the products imported went to Mexico (FAO 2005b and FAO 2005c).

Except for the roundwood exports from Uruguay to Spain, only Brazil and Chile contribute significantly to Latin Americans exports to Europe. The following tables give an indication of 2003 figures for both Latin-American exports to and imports from Europe.

Table 2.1. Main exports to Europe by product group and country (1,000 m³ or 1000 MT) and percentage of total exports of that country of that product group in 2003 (data from FAO 2005b, only for countries that are globally main exporters for product groups).

Product group	Brazil	Chile	Uruguay	Mexico	Colombia
Round wood			1,065 (81%)		
Woodchips and particles	56 (4%)	90 (2%)			
Sawn wood, coniferous		147 (7%)			
Sawn wood, non-coniferous	487 (45%)				
Veneer sheets		17 (25%)			
Plywood	982 (46%)	61 (20%)			
Wood pulp	986 (38%)	1030 (49%)			

Table 2.2 Main imports from Europe by product group and country (1,000 m³ or 1000 MT) and percentage of total exports of that country of that product group in 2003 (data from FAO 2005b, only for countries that are globally main importers for product groups).

Product group	Brazil	Chile	Uruguay	Mexico	Colombia
Veneer sheets				1 (3%)	
Plywood				3 (1%)	
Fibre board				59 (36%)	
Wood pulp				2 (<1%)	
Newsprint	49 (20%)			9 (5%)	
Other paper and paper board				246 (16%)	

Interesting is the rapid increase in wood product exports, in the year 2002-03 increases were notably in woodchips (53% in Chile), sawnwood from coniferous species (33% above all Chile) and Plywood (53% in Brazil, 23% in Chile). The exports of pulpwood (Chile) and non-coniferous sawnwood (Brazil) declined slightly (2% and 1% respectively) (FAO 2005b). While these figures need to be treated with some care, since, due to short period over which these occurred, these may mean natural fluctuations in the market, they also confirm long term trends for Latin America: increases since the late nineteen seventies in exports of sawnwood, and veneer and plywood (since 1990). Also the export of wood-based panels increased in the long term as did that of pulpwood (FAO 2005c), the latter indicating that the slight drop in Chile between 2002 and 2003 may be a temporary one only.

Looking at more detail at the three Latin American countries with greatest share of international trading in the region, Brazil, Mexico and Chile, their import (Table 2.3) and export (Table 2.4) of wood based products were summarized in a trade balance (Table 2.5) for a 5 year period (1999-2003).

The value of the trade balance for Brazil increased from 1999 to 2003 by 20% (Table 2.5), with increases in the values of export of timber products and decreases in the values of paper and pulp product imports. In this period it is above all the value of wood-based panel exports that increases (57%). It should be realized though, that the total trade value (imports + exports) for Brazil is estimated to be only about 12.6% of total wood products production for 2003 (assuming local prices to be an average between import and export unit prices).

In Mexico, exports went down and import values up. In none of the product groups Mexico is or has been a net exporter. Main imports are paper and paper boards, sawn timber and then wood pulp. Both in 1999 and in 2003 its trade balance is even more negative than Brazil's is positive. Greatest percentage increase is in the value of sawnwood imports (71%), followed by the increase in value of wood-based panels imports (55%). Trade as percentage of production value in Mexico is estimated at 16.6%. FAO data do not include secondary processing wood products though, and according to ITTO, México is an important exporter of these products (ITTO 2006).

In Chile, the value of imports increased, above all in the group of paper and paperboard products (27%). Its main export product is wood pulp (57% of total in 1999 and 56% in 2003), but highest value increase occurred in export of wood-based panels (66%) and paper and paper-board (26%), against 15% for wood pulp. Overall value of exports increased, resulting in a growing positive trade balance for forest products (13% growth in five years). Total value of trade as percentage of estimated value of total production is approximately 36.5% in 2003¹.

Table 2.3. Imports, (1,000 US\$) for the three Latin American countries with greatest share of international trading in the region, Brazil, Mexico and Chile in 1999 and 2003 (FAO 2005b).

Imports	Brazil		Mexico		Chile	
	1999	2003	1999	2003	1999	2003
Roundwood	1,013	1,283	8,328	8,135	0	0
Sawnwood	51,592	59,087	202,548	345,511	0	11,717
Wood-based panels	32,980	42,863	185,285	287,208	2,500	8,689

¹ These percentages have above all comparative value, no absolute value should be attached to them, since no figures for locally consumed timber product values are given in the documents reviewed

Wood pulp	167,989	213,594	276,053	310,320	6,222	7,321
Other fibre pulp	16,247	13,070	2,742	2,508	0	0
Recovered paper	3,996	1,685	184,067	173,894	0	0
Paper and paperboard	555,555	396,078	1,246,048	1,278,114	182,135	230,946
Total	829,372	727,660	2,105,070	2,405,690	190,857	258,673

Table 2.4. Exports (1,000 US\$) for the three Latin American countries with greatest share of international trading in the region, Brazil, Mexico and Chile in 1999 and 2003 (FAO 2005b).

Exports	Brazil		Mexico		Chile	
	1999	2003	1999	2003	1999	2003
Roundwood	22,286	30,181	1,300	1,686	50,083	13,027
Sawnwood	497,408	548,941	64,631	22,774	251,379	275,040
Wood-based panels	448,852	704,351	23,589	8,855	116,447	192,983
Wood pulp	1,240,973	1,146,313	969	26,000	766,765	881,927
Other fibre pulp	0	0	0	0	0	0
Recovered paper	0	0	37,427	3,150	1,367	1,100
Paper and paperboard	302,428	310,941	141,537	128,105	162,910	204,752
Total	2,511,947	2,740,727	269,453	190,570	1,348,951	1,568,829

Table 2.5. Trade balance (1,000 US\$) for the three Latin American countries with greatest share of international trading in the region, Brazil, Mexico and Chile in 1999 and 2003 (FAO 2005b).

Trade balance	Brazil		Mexico		Chile	
	1999	2003	1999	2003	1999	2003
Roundwood	21,273	28,898	-7,028	-6,449	50,083	13,027
Sawnwood	445,816	489,854	-137,917	-322,737	251,379	263,323
Wood-based panels	415,872	661,488	-161,695	-278,353	113,947	184,294
Wood pulp	1,072,984	932,719	-275,084	-284,320	760,543	874,606
Other fibre pulp	-16,247	-13,070	-2,742	-2,508	0	0
Recovered paper	-3,996	-1,685	-146,640	-170,744	1,367	1,100
Paper and paperboard	-253,127	-85,137	-1,104,511	1,150,009	-19,225	-26,194
Total	1,682,575	2,013,067	-1,835,617	-2,215,120	1,158,094	1,310,156

Based on the estimates on changes for the period 1980-2003 and considering changes in the drivers of the forest economy² FAO (2005a) projected further changes until 2020 (Table 2.6). These estimates were based on revision of data provided by 20 countries in Latin America and the Caribbean (LAC) region and validated in sub-regional workshops with experts in the subject.

These production figures show an increase in production, while at the same time the area under natural forest is expected to decrease further, to 875 million hectares by 2020, mainly driven by extra and intersectorial forces, such as the demand for forest products by other sectors and the international market; greater areas for agriculture and livestock development; more infrastructural development; changes in the agricultural subsidies in Europe and the

² They consider five mayor drivers: 1) socioeconomic changes, such as population growth; 2) policies and strategies directed at complying with sustainable development objectives, in particular alleviation of poverty and conservation of biodiversity; 3) economic growth, free trade, regional integration; 4) private or public investments, and 5) changes in technology.

USA; and changes in local subsidies that have stimulated land use changes; and policies that promote the use of biomass as alternative source of energy.

Table 2.6. Production estimates for the LAC region for the years 1980, 2003 and 2020 (FAO 2005a)

Product group	Unit	1980	2003	2020
Pulp	Million MT	4.8	13.3	28.4
Paper and board	Million MT	7.7	16.4	28.7
Round wood	Million m ²			
Sawn wood	Million m ²	25.9	39.4	54
Wood based panels	Million m ²	4.3	10.5	20
Wood for fuel	Million m ²	207	271	
Charcoal	Million MT	9.4	15.4	

Ten companies produce more than 50% of all the paper and paper- and cardboards in the region. Sawn wood increasingly comes from plantations (*Pinus* spp and *Araucaria angustifolia*), particularly in the South Cone. Most of the increase in production comes from these countries and Brazil, while Colombia, Ecuador, Peru and Mexico show a decrease in production of sawn wood between 1980 and 2003. Sawn wood is the main export product for Belize, Honduras, Guatemala and Nicaragua, but is produced by an obsolete industry whose equipment needs to be replaced to become more efficient in the use of raw material.

Wood-based panels are mainly produced in Brazil (60% in 2003, FAO 2005a). The increase in production of plywood from pine has been considerable, taking up about 36% of the total wood-based panel production in 2003 (FAO 2005a), as has that of particle board (29%) and medium density board, but that of hardboards has hardly changed. Most of this production is oriented towards the exportation towards the USA and Europe. Brazil, Argentina and Chile expanded their production capacity with new and improved industries, using pine plantations as the base for their input in raw materials.

Production of wood based fuels is growing at a steady rate of 1.2%/year. This is true for fuel wood, of which more than half is produced in Brazil, and with Mexico (14%), Guatemala (5.7%) and Chile (4.7%) this accounts to nearly 75% of the fuel wood production in the region. Production and consumption data, however, are deficient, largely due to the informal nature of production and consumption. Its importance for especially the rural poor is mentioned, indicating that the three poorest countries of Central America fuel wood production accounts for about 70% of total forest use. Much of it comes from native species, but an increasing part is used on an industrial scale, coming from plantations established for that purpose.

Charcoal production also increased, by about 2.2%. Most of the charcoal is used by the iron and steel industry, with Brazil being the main producer: 80% of the regions charcoal production (FAO 2005a). Colombia, Peru, Venezuela and Chile together produce about 12% of the total regional production. Although a large part of charcoal still comes from natural forests, eucalypt plantations are increasingly being used for this purpose.

Although non-timber forest products are a valuable asset to local communities and some have achieved relatively important international trading levels (brazil nut, *Bertholettia excelsa*, and rubber, *Hevea brasiliensis*, for example), no reliable statistics are available on their production, consumption nor trading. This is due in part to the informal character of most of their production and trading, as well as to the highly variable methods of data collection and interpretation, in time, between countries and between products. The products with main economic importance are the brazil nut (from Brazil, Bolivia and Peru), rubber, palm heart

(several species, from above all Brazil and Bolivia), and matte (*Ilex paraguariensis*, from Argentina, Brazil and Paraguay). A high variety of other products is destined mainly to smaller markets.

Only recently markets are developing for the mayor environmental services, although their production is not new. Above all markets for sale of carbon are developing in Brazil and Central America, while water protection services are marketed at watershed level. Only Costa Rica has a national system that also considers biodiversity conservation as one of the services paid for. In general, the demand for environmental services is thought to go up in the future, but no quantitative estimates have been made by FAO (2005a).

2.1.1 Consumption estimates for the LAC region

The consumption of sawn wood (Table 2.7) has increased at a similar rate as its production, at about 1.6% per year, well below that of the consumption of pulp and paper, which more than doubled in the same period. 60% of the sawn wood consumption comes from plantation trees and most is consumed by the processing industry to produce products of added value and packaging. Relatively a small percentage is used for construction purposes.

The consumption of wood-based panels (Table 2.7) shot up after 1996, due to an increased economic growth and the construction of secondary processing plants that use particle boards or medium density board as an input. Its consumption is very much related to demographic and economic growth. This will above all affect the demand for MDF and particle board, used in the manufacture of furniture, and for OSB in construction work where it replaces other products while several governments implement policies in favour of the building market.

Fuel wood and charcoal consumption (Table 2.7) follow very much the trends seen in their production, with very little import and export occurring.

Table 2.7. Consumption estimates for the LAC region for the years 1980, 2003 and 2020 (FAO 2005a)

Product group	Unit	1980	2003	2020
Pulp	Million MT	4.2	9.8	18.4
Paper and board	Million MT	9.7	20.5	35.5
Round wood plantations	Million m ²	60	180 ³	
RW natural forest	Million m ²	96	71	
Sawn wood	Million m ²	26.2	37.9	50
Wood based panels	Million m ²	4.2	8.2	18
Wood for fuel	Million m ²	206.7	271.1	331*
Charcoal	Million MT	9.4	15.3	22

*The consumption of wood for fuel will depend very much on the recent efforts within the framework of the Kyoto protocol to increase the use of renewable energy. It is too early to make predictions of the effects of this change.

Exports of wood and wood based products have significantly increased between 1980 and 2003 (Table 2.8). Chile and Brazil are the main exporters, and most of their exports are in the form of pulp or paper, Brazil specializing in short fibre pulp, mainly from eucalypts, and Chile in long fibre pulps of pine species. Argentina, Mexico and Colombia are also big pulp and paper producers but their export levels are well below that of Chile and Brazil. Brazil is world's greatest pulp exporter, in 2003 representing 64% of the regions forest products'

³ These figures assume an average productivity of 25 cum/ha in nearly 12 million hectares, however, are those figures realistic?

exports (FAO 2005a). While exports of pulp are mainly oriented towards USA and Europe, the paper and paperboard exports are mainly oriented towards regional trade partners.

Table 2.8. Export estimates for the LAC region for the years 1980, 2003 and 2020

Product group	Unit	1980	2003	2020
Pulp	Million MT	1.3	5.0	13.5
Paper and board	Million MT	0.4	1.6	
Sawn wood	Million m ²	2.8	5.3	8.3
Wood based panels	Million m ²	0.6	4.1	8.7

It is interesting to see that most of the export increases occurred after 1990. This is the case for pulp and paper, as well as for sawn wood and wood based panels, which latter started to increase rapidly after 1992. The economic crisis of the 80s that occurred in most countries of the region may be one of the mayor reasons for that. Sawn wood comes for 70% from *Pinus* spp and above all is exported by Brazil, Chile and Argentina to the Unites States and South-East Asia. Most of the remaining 30% comes from native tree species in Brazil and Peru and is exported to Europe.

The increase in export of wood based panels is nearly entirely due to the increase of exports of plywood made of pine from Brazil and Chile, which are exported to USA and Europe.

Pulp was mainly imported by the paper industry in Brazil, Argentina and Mexico, while the import of paper was also greatest in these three countries, importing mainly from other countries in the region.

As for pulp and paper, imports of sawn wood declined during the eighties, but increased when the countries started to recover from their economic crisis (Table 2.9). The import of wood-based panels is of more recent history, with an enormous increase towards the end of the century. Most of it (66%) is plywood and Costa Rica is the biggest importer, buying above all from Chile. Mexico and Colombia imported above all particle boards and MDF, while Brazil became self-sufficient in MDF towards the end of the nineties.

Table 2.9. Import estimates for the LAC region for the years 1980, 2003 and 2020

Product group	Unit	1980	2003	2020
Pulp	Million MT	0.8	1.6	
Paper and board	Million MT	2.4	5.6	
Sawn wood	Million m ²	1.8	3.5	
Wood based panels	Million m ²	0.2	1.3	

2.1.2 Secondary Processed Wood Products

As mentioned above, FAO (2005b) does not provide data on secondary processed wood products (SPWP) but ITTO (2006) shows that in particular Brazil has a rapidly growing export of furniture, made of solid pine and reconstituted panels, becoming one of world's biggest exporters of SPWP. Production of greater added value products increased; mainly due to the need to improve sawmill economic results. Products include mouldings, fences, floors, furniture, doors and windows, above all produced for the export market. Data, however, are imprecise and FAO (2005a) only presents estimates for Brazil for the period between 1997 and 2002 (Table 2.10).

The reduction in the value of furniture production is mainly due to changes in exchange rates during the period 2001-2002. Most of the consumption in LAC is of furniture, the other products have a greater emphasis on the international market.

Table 2.10. Production of mouldings, floors, doors and furniture in Brazil during the period 1997-2002

Year	Mouldings (1,000 cum)	Floors (1,000 cum)	Doors (1,000 units)	Furniture (million US\$)
1997	35	4,700	3,400	n.d.
2000	300	21,750	4,800	4,815
2001	438	21,670	6,000	4,129
2002	490	22,500	6,300	3,526

2.1.3 Reliability of the data

Most of the data used here come from FAO and ITTO statistics with their common shortfalls. Their data are based on information provided for by the countries themselves: not all countries submit information every year for all products, while often confusion exists with the classification of data (e.g. tropical versus non-tropical). This information does not take into account illegally harvested or traded wood, which is a complex issue and cannot be directly derived from either differences between trade data or percentage estimates of illegal logging in a country.

The FAO and ITTO data, however, have been analyzed by a group of experts and are currently the best existing data on world timber production and trade. For more detailed information country studies should be performed looking at trading trends over long periods of time and establishing relations with factors that may influence these trends.

2.2 Assessment of potential drivers behind the changes in trade values

To assess the potential impact of changes in the EU FWC and LAC FWC and how these may affect each other it is important to assess the most important drivers affecting trade to and from the LAC region.

2.2.1 Wood prices

The first reason may be changes in wood **prices**. Prices have fluctuated over the five year period, but using 1999 as beginning and 2003 as end point, the FAO data indicate price increases for;

- Brazil: import of roundwood (20%), sawnwood (5%), other fibre pulp (3%) and, slightly, recovered paper and paper and paperboard (2% and less than 1% respectively). Export prices of sawnwood (7%), woodpulp (3%), and paper and paperboard (4%);
- México: imports of roundwood (11%) and exports of roundwood (18%), sawnwood (10%) and wood pulp (10%);
- Chile: export prices of wood-based panels (1%), wood pulp (1%) and recovered paper (26%).

And price decreases for;

- Brazil: imports (1%) and exports (2%) of wood-based panels and exports of roundwood (43%);
- México: imports of sawnwood (17%), wood-based panels (1%), wood pulp (1%), other fibre pulp (1%) and recovered paper (4%) and export prices of wood-based panels (9%) and recovered paper (42%);
- Chile: import prices of wood-based panels (3%) and paper (1%), and export prices of roundwood (38%), sawnwood (13%) and paper (2%).

ITTO (2006) indicates that for 2005 several Brazilian export products saw price rises, due to a high demand in the USA and UK, loss of duty free status (plywood to the USA), and the strong local currency. Sawnwood prices from Chile also rose since 2003 to reach near 1996 prices in 2005 (WRI 2005).

If prices influence the total import and export values we would expect the imports to have an inverse reaction to price changes, while exports would react in the same direction, assuming that volumes traded react quickly to price changes. This is the case for many product groups, but not for roundwood in Brazil (import and export), sawnwood in Brazil (import) and Chile and Mexico (export), wood-based panels in Brazil (increase export but decrease in price), wood pulp in Brazil (export) and Chile (import), and paper products in Mexico (import and export) and Chile (export only).

The lack of clear tendencies may be due to the dependence of that sub-sector in that country on the international trade. In the case of imports, the demand may be determined by increased local consumption, and the increased demand may have increased import prices, even if international prices haven't changed. In the case of exports, the export may be supply driven, due to an industry that needs to work at a minimum capacity to break even or due to government policies that favour investment in downstream processing. With an installed capacity much greater than local consumption the country may be forced to keep increasing export, in spite of lowering prices. The effect of restricted availability of mahogany on the prices of sawnwood timber, as noted by ITTO (ITTO 2006), are not apparent in the FAO data, probably due to the fact that its inclusion in CITES Appendix II did not take place until late 2003. ITTO (2006) also mentions exchange rates as possible causes for price changes, and considering the downward trend of the dollar over the last few years against the main currencies, this could explain certain price hikes if expressed in US\$, above all in timber traded with Europe and some of the Latin American countries, that have experienced relative economic stability over the past few years (Brazil, Peru, for example). These causal effects, however, cannot be derived from the data and this would need more detailed study of local production and trade figures.

2.2.2 Incentives for plantation establishment

Most of the export comes from plantations, particularly in Chile (89% of wood products exported, INFOR 2003 cited in FAO 2005a) and the pulp, paper and board products in Brazil. Increasingly, however, wood-based panels also are manufactured from non-coniferous species (planted or natural), while both sawn wood and wood-based panels in Brazil comes from non-coniferous species from the natural forest (WRI 2005). WRI (2005) estimates for example that 50% of the production of the Eucalyptus plantations in Brazil (3.3 million hectares) is destined to the pulp industry, which owns 1.2 million hectares of these plantations. 40% is for charcoal production and 10% for wood-based panel production. Past incentives, however, may have had a great influence on current export levels and may partially explain that export

increases in spite of lowering prices (sawn wood and paper and board in Chile). Above all, however, increased investment by European and United States companies, transferring their operations to countries where the resource and labour costs are lower, is playing a role in increasing plantation establishment, mainly for wood pulp products. The establishment of a plant of the Spanish ENCE company in Uruguay, for example, was responsible for an enormous increase in the wood chips exports of that country to Spain (WRI 2005). In Chile one company owns 650,000 ha of plantation and is looking for further increases, both in Chile, Brazil and Argentina, in order to secure the supply of raw material to its expanding plants (INFOR 2007). In Brazil it is estimated that 77% of the needs for industrial roundwood is supplied from forest plantations, mainly of Eucalypt and Pinus spp (FAO 2005a). It cannot, however, explain the increased exports of roundwood and wood-based panels from Brazil, since most of this probably comes from the natural forest. Again, this would require more studies.

The **Clean Development Mechanism (CDM)** has the potential to even further increase the area under forest plantations. Recently, however, the increase rate of plantation establishment in Brazil (200,000 ha/year) and increasing competition for land with other economic activities, has increased land prices by 70% (WRI 2005) possibly off-setting some of the benefits that could have been achieved by the CDM. It may be difficult to include plantations for pulp and paper in the CDM, due to the release of carbon after the products has been used, but this may be overcome by applying for short term carbon credits. Until 2003, however, most CDM projects were proposed for the energy sector, oriented at creating sources of renewable energy and substituting fossil fuels for other forms of energy (UNIDO 2003).

2.2.3 Social aspects of forest and plantation management

More than conservation issues, forest management in Latin America is dealing with social issues, although some of them can be environment related. Examples are the new pulp mill that was to be build in Uruguay along Rio de la Plata that passes through Argentina (WRI 2005). Similarly, the FACE-Foundation faces difficulties with its plantations in Latin America, some of which are said to interfere with traditional land use rights; in Peru most of the newly assigned industrial concession areas show overlap with local people's rights, causing delays in operations. Further studies would have to be made how much area is affected by these issues and how much potential production is involved.

Many of the problems observed between companies, managing either plantations or natural forests, arise from poverty, or more precisely even, the difference between those that have and those that have not. This problem becomes even more apparent if there are conflicts concerning land-use rights or if for example indigenous communities that do not have their rights on community forests officially recognized while neighbouring logging companies claim rights to many thousands of hectares of forest. Also friction is caused in cases where communities have little access to services and markets, while company employees drive around in 4x4 vehicles or use other tools of the trade considered to be items of luxury by the local communities. It is interesting in that respect that three of the four countries with the highest HDI ⁴in Latin America (Chile, Uruguay and Costa Rica, UNDP 2005) are the only ones in the region that have inverted their net deforestation rate and are now considered to be gaining forest area (FAO 2005d). Of these, Chile is a net forest product exporter while Uruguay has is increasing its wood products exports (FAO 2005b).

⁴ Human Development Index as defined by the UNDP (UNDP 1998). A composite index of life expectancy at birth, adult literacy, school enrolment and local purchasing power parity of GDP per capita

2.2.4 Increased demand for value adding in export countries

Recently many LAC countries have prohibited the export of logs, to stimulate value adding in their countries. Brazil has had a ban on export of logs in place since 1969 (Kishor et al 2001), Costa Rica since 1986, with additionally a sawn wood export ban installed in 1987 (Simula 1999), while Ecuador and Bolivia also had log export bans reducing local round wood prices, increasing local processing capacity, albeit resulting in greater inefficiency (Simula 1999, citing Stewart and Arias 1995).

Such bans have had as a result the dumping of logs on national markets, decreasing local log prices and thus the cost of local processing. This effect has been greater where processing plants existed but were producing below their capacity, or with antiquated machinery, the lower costs of inputs allowing them to modernize.

Policies promoting foreign investments have also had a positive role, both on industrial development and establishment of plantations (FAO 2005a). Particularly in the South Cone of Latin America (Argentina, Uruguay, Chile, the South of Brasil and Paraguay) investment in pulp and paper mills has increased and aiming to secure their raw materials, many plants have started to invest in their own plantations (see previous section on plantation establishment).

2.2.5 Increasing local consumption

Increasing local consumption may cause negative changes in export (if this brought local prices up) and increases in imports, probably accompanied by increased prices. In Latin America in general, local consumption has increased between 1999 and 2003, particularly of wood pulp (46% increase), recovered paper (22%) and sawnwood (18.5%), but only for paper and recovered paper it exceeded regional production (FAO 2005b). For Brazil these figures are 54%, 18% and 26% respectively as well as an increase in paper and paperboard consumption of about 22% for the same time period.

Population and economic growth are the main drivers for greater consumption. FAO (2005a) estimates population to grow by 100 million people until 2020.

2.2.6 Increasing transport costs

Comparing export and import prices at a global scale, there are clear indications of increasing transport costs for certain products and to certain markets. Pulp log exports from Uruguay to Spain, for example, have gone down due to increased transport prices, making the logs of similar prices as ones obtained from Portugal (WRI 2005). As long as no detailed information on the trade directions for each product group and each country is available, it will be difficult to assess the effect of this on the volume and value of trade.

2.2.7 Increasing forest conservation

It is often argued that logging is one of the main causes of deforestation. Palo and Lehto (2005), however, analyzed publicly available data of 64 tropical countries. Although they found that the total value of international trade of a country as a percentage of total GDP of that country (openness of trade) did have a significant correlation with deforestation, it was far outweighed by the correlation between the Human Development Index as defined by the UNDP (UNDP 1998)⁵ and deforestation, and in addition, only a small percentage of this trade

⁵ A composite index of life expectancy at birth, adult literacy, school enrolment and local purchasing power parity of GDP per capita

relates to forest products. In El Petén, in Guatemala, the implementation of community and company concessions has helped to maintain the forest area under better conditions than neighbouring natural parks could (e.g. Carrera and Prins 2002). In addition, in Latin America 20% of the territory is under some form of protection, but this may not have had much influence on the timber supply for export. The extent of the forest areas is such that any decrease in availability of forest areas is not felt immediately. In Peru, for example, the production forest is over 24 million hectares, but by December 2006 only 7.5 million hectares had been assigned to forest companies⁶. In Brazil large state forests are only now being opened for (legal) harvesting. Comparing FAO estimates for production forest and its sustainable production capacity (425 million hectares in 2003 that could produce 320 millions of cubic meters per year, FAO 2005a) with the actual production of 71 million m³ of roundwood, it is clear that in terms of total volume reductions of 10-15% in forest production area will not affect actual production capacity. However, availability of certain species, in particular the high value ones, may very well be affected. More so, because in the past these species have been harvested without considering their replacement and often the harvested forests are the ones more affected by forest conversion. Replacement of any newly harvested timber will therefore largely depend on the silvicultural activities and protective measures in the current harvesting areas. For species such as mahogany this will need periods of replacement of trees of over 60 years, while the volumes harvested may never be recovered within the natural forests (currently trees with volumes of up to 30 m³/tree may be harvested, while in the future volumes will more likely be in the range of 2-5 m³/tree). In most countries, this period for replacement is well over the duration of actual cutting cycles, which range from 20 to 30 years.

Moreover, most of the export products appear to be coming from forest plantations, above all those products related to pulp and paper. Greater effects could be expected from requirements to **reduce environmental impacts**. In plantations it may increase the costs of operation, thus making it less attractive to establish new plantations. This may have a long term rather than an immediate effect, although it is also possible that certain companies decide not to harvest their timber due to high costs of environmental friendly harvesting. Harvesting costs in the natural forest may actually be reduced per cubic meter in comparison to previous, uncontrolled, practices, as long as the companies can afford it to make an initial investment in training (e.g. Applegate *et al* s.f.). It may, however, mean that even less of the traditional high value species will be available.

2.2.8 Forest certification

Latin America has the largest area under forest management of the tropics, with over 10 million hectares certified under the FSC scheme, 5.1 million of them in Brazil (FSC 2006). In Brazil, 2.8 million hectares are natural or mixed forests and 2.3 million hectares are plantations (43% of the total plantation estate according to the estimate of WRI 2005). In Peru, companies harvesting natural forest have been looking for certification in order to secure their access to international markets and with the expectation to be able to increase their exports. Even if only a small portion of their market demands certified timber or timber products it appears to be attractive for them to seek FSC certification: it improves their image, in Peru it reduces their cost of harvesting rights by 25%, and it basically expands their market access. In addition, currently it is the only reliable way to be able to show compliance with

⁶ It should be noted, though, that previously harvesting took place in 1,000 ha harvesting areas and much of the not officially assigned areas may have been creamed off its most valuable species before 2,000, when illegal logging was said to count for 80% of the timber supply (ITTO 2003).

CITES II requirements for mahogany (even though the government and CITES are still debating other means).

One of the effects of certification has been that companies pay more attention to their neighbours. Thus, certified companies will generally at least temporarily have solved both environmental and social problems. Solving these problems may require greater investments than they made prior to certification, but in the end it may prevent interruptions in harvesting operations, which could become much more expensive.

Technically, certification can be seen as a trade barrier that increases costs for the producers. Costs of certification, however, vary greatly from one company or community to another and from one country to another, depending on the enabling conditions in a country and the initial state of forest management in the management unit. Where most rapid progress has been made (for example in Bolivia and Guatemala) high international investments motivated such progress and thus have off-set the effects of the trade barrier effect of certification. An estimated 40 million US dollars in Bolivia during BOLFOR I helped create some of the enabling conditions for responsible forest management. In spite of progress in management, however, little progress has been made in international trade. Thus, there is great scope for increasing trade of certified timber from countries that already have certified operations, while in some countries certification is just starting and with a trade incentive progress could be sped up.

2.2.9 Forest legislation and policies in the region

Since 1996 a number of Latin American countries changed their legislation, intending to increase control, production and at the same time reduce negative environmental effects of logging (such as deforestation). While more and more area is now under responsible management (from 60,000 ha managed in 1989 (Poore *et al* 1989) to over 10 million hectares certified in 2006 (FSC 2006)), deforestation is still continuing at rates higher than in other tropical regions (0.5% per year, Galloway *et al* 2005).

Some legal restrictions appear to have had positive effects on the forest sector. Log export bans in countries with installed capacity have lowered national log prices and increased national processing, thus increasing the added value in the region. Its effect may have been contrary to some segments of the forest sector - tree owners would have gotten less for their trees – and this may have contributed to a larger gap between the poor and the rich, the industry owners usually belonging to the latter.

Stricter legislation in general has had an initial fall back in log production, followed later by an increase, once the implications of the new legislation have been well-understood, including the forms and local capacity for implementation of the legislation. In Peru the concession process has apparently stimulated the forest industry, increasing its exports to the USA and Europe. In Petén, Guatemala, mahogany exports are maintained at a similar level as before the concession process, but in some cases prices of raw material have about doubled (Ortiz *et al* 2001). Brazil hopes to achieve the same through its new legislation. No data are available yet, however, that can show a quantitative and causal relation between concessions and exports.

Policies in favour of forest certification have also had promising results, although often depending on the availability of external funding. In Bolivia external funding provided much of the expertise necessary to become certified, while the state offered different incentives, such as an initial reduction in payment of harvesting rights and later administrative advantages. In Peru the reduction of 25% in harvesting rights is an important incentive to seek

certification for those companies that also have positive international market prospects. In Guatemala concession contracts required certification within three years of signing the agreement while at the same time USAID funded projects helped to improve the enabling conditions.

Probably the policies that have had most effects on timber and timber product production and exports, have been policies that stimulated international trade and investment, permitting an increase in the installed capacity of the paper and pulp industry with foreign capital and increasing the need to ensure local raw material supplies, as well as the need to make technological improvements in order to improve efficiency of raw material use.

2.2.10 Forest institutions

In general, forest institutions and forest administration in the LAC countries are weak, poorly organized, and count with relatively little financial and human resources. Up to 2002 only five countries had a clear future vision of the forest sector (FAO 2002b, cited in FAO 2005a). This is part of the reason of continued deforestation (although this may be more influenced by policies in other sectors) and poor application of the existing policies and legislation. Thus some of the positive steps taken in the countries may in the end have very little effect as long as the institutions are not strengthened.

This is expected to effect above all the quality of forest and plantation harvesting and management and thus may have strong negative effects for timber exports from natural forests under conditions in which importing countries will request proof of legal or well-managed origin.

2.2.11 Forest legislation and policies in Europe

Trade restrictions and subsidies to national industry are probably the factors that most affect trading between Latin America and Europe. Among trade restrictions should be included import duties, CITES, the FLEGT initiative as well as FSC or PEFC certification requirements. CITES, FLEGT and certification above all require companies and communities to re-invest in the forests and plantations which may make management more expensive. Above all the requirement to show legality of the timber source appears to be the driver for reduced timber production in natural forest areas. It should be noted, though, that these figures are official records, and therefore are based on legal timber production. Estimates on illegal timber production have dropped from around 80% for the countries in the Amazon region around the year 2000, to between 50 and 80% in 2005 (unofficial figures). It is not sure, however, how reliable these figures are, and it is not clear how much, if any, of this has been incorporated into the production estimates of FAO (2005a). A reduction in illegal timber would above all affect local timber prices, since these are the main destinations of illegally harvested timber. However, if these rise sufficiently, they may become competitive with international timber prices and thus reduce the amount of timber available for exports, while at the same time reducing financial incentives for international companies to settle in Latin America, near cheaper sources of raw material.

Looking at plantation production figures, it is well possible that a shift towards plantation timber is taking place.

2.2.12 Elasticity of supply and demand

Because many timber species can be used for more than one purpose, for a number of products a quick shift from one product to another product is possible. More often, however, shifts have occurred due to substitution by other, more economic products. In the LAC region this has occurred for roundwood, either by roundwood from other regions, (for example from natural forests to plantation forests and from native species to pine and eucalypt, enlarging the already existing emphasis on the southern part of the region) or by-products other than timber. This has less occurred for products from high value timber species, such as teak and mahogany from natural forests.

Wood-based panels, in particular Medium Density Fibre boards (MDF) and Oriented Strand Boards (OSB), are slowly replacing the use of sawn wood, particularly in mouldings and some parts of furniture. These require more advanced technology, thus placing most of the LAC countries in a disadvantage. In Brazil and Chile, however, it is rapidly replacing the more expensive plywood.

Polivinyll chloride (PVC), aluminium, steel are some of the mayor products replacing wood products. Although these may have technical advantages over wood, FAO (2005a) cites another FAO study (2002) indicating that in terms of the energetic balance and in terms of environmental equilibrium, these products cannot compete with timber, as long as harvesting is followed up by proper silvicultural practices.

2.3 References

- Applegate, G., Putz, F.E., Snook, L.K., s.f. Quién paga y quién se benefice con las prácticas mejoradas de aprovechamiento forestal en los trópicos? Yakarta, Indonesia, CIFOR. 35 p.
- Carrera, F., Prins, K., 2002. Desarrollo de la política de concesiones forestales comunitarias en Petén, Guatemala: el aporte de la investigación y experiencia sistematizada del CATIE. *Revista forestal centroamericana* 37: 33-40.
- FAO, 2002a. Environmental and energy balances of wood products and substitutes. (Scharai-rad, M., and Welling, J.).
- FAO 2002b. Antecedentes socioeconomicos, instituciones y tendencias y perspectivas del sector forestal en America Latina. Workshop report, Santiago Chile, Fao. Available on internet: <http://www.fao.org/docrep/007/ad410s/ad410s00.htm>, consulted 6th March 2007.
- FAO, 2005a. Tendencias y perspectivas del sector forestal en Latino América y el Caribe, FAO Forestry Paper 148, Rome, Italy, FAO. 178 p.
- FAO, 2005b. FAO anuario de productos forestales 2003. FAO Forestry Series no 38. Rome, Italy, FAO. 243 p.
- FAO, 2005c. Trends in Wood Products 1961-2003. Rome, Italy, FAO. 55 p.
- FAO, 2005d. Global Forest resource Assessment 2005 – Progress towards sustainable forest management. 2005. FAO Forestry Paper 147, Rome, Italy, FAO.
- FSC, 2006. List of certified forests as of December 2006. Consulted on line January 2007: http://www.fsc.org/keepout/en/content_areas/92/1/files/ABU_REP_70_2006_12_21_FSC_certified_forests.pdf
- Galloway, G., Kengen, S., Louman, B., Stoian, D., Carrera, F., Gonzalez, L., and Trevin, J., 2005. Chapter 15: Changing paradigms in the Forestry Sector of Latin America. In: Mery. G., Alfaro, R., Kanninen, M., Lobovikov, M., (eds) 2005. *Forests in the Global Balance – Changing Paradigms*, IUFRO World Series vol 17. Helsinki. Pp 243-264

- INFOR (Instituto de Investigación Forestal de Chile) 2003, Boletín Estadística 93. Exportaciones forestales chilenas. Available on line : http://www.infor.cl/webinfor/estadisticas_Forestales/estadisticas_boletin93_export2003.htm
- INFOR 2007. Escenario 2007 para sector forestal en Chile. Available on line: http://www.chilenoticias.cl/Comunicaciones_INFOR/Archivo_Noticias/2007/Febrero2007/Noticias/27_02_escenario.htm, consulted 5th March 2007.
- ITTO (International Timber Trade Organization) 2003. Achieving the ITTO Objective 2000 and Sustainable Forest Management in Peru – Report of the Diagnostic Mission. Presentado a la 35 sesión del Consejo Internacional de Madera Tropical en Yokohama, Nov 2002. OIMT informe de misiones. Yokohama. 10 p.
- ITTO, 2006. Annual review and assessment of the world timber situation 2005. Available on line at <http://www.itto.or.jp/>, consulted January 2007. 214 p.
- Kishor, Nalin, Mani, Muthukumara and Constantino, Luis, 2001. "Economic and Environmental Benefits of Eliminating Log Export Bans the Case of Costa Rica" (October 2001). IMF Working Paper No. 01/153 Available at SSRN: <http://ssrn.com/abstract=879971> (consulted March 28 2007).
- Ortiz, S., Carrera, F., Ormeño, LM., 2002. Comercialización de productos maderables en concesiones forestales comunitarias en Petén, Guatemala. Turrialba, Costa Rica, CATIE. Serie Técnica. Informe Técnico no. 326. Colección Manejo Diversificado de Bosques Naturales 24. 31 p
- Palo, M., Lehto, E., 2005. Poverty reduction by tropical forests? *Silva Carelica* 50: 44-61
- Poore, D., Burgess, P., Palmer, J., Rietbergen, S., Synnott, T., 1989. No timber without trees: sustainability in the tropical forest. London, United Kingdom, Earthscan. 252 p.
- Simula, M., 1999. Trade and Environmental Issues In Forest Production. Environment Division Working Paper, InterAmerican Development Bank, 44p. available on line: <http://www.iadb.org/sds/doc/1306eng.pdf>. Consulted 27 March 2007.
- Stewart, R. & G. Arias. 1995. Exportación de madera en troza: ¿por qué un NO a la prohibición? *Revista Forestal Centroamericana* 4(12):16-18.
- UNDP 1998. Human Development Report 1998. Available online at: <http://hdr.undp.org/reports/global/1998/en/>, consulted February 2007.
- UNDP, 2005. Human Development Report 2005. International cooperation at a crossroads. New York, USA, UNDP. 372 p.
- UNIDO 2003. CDM Investor guide Brazil. Vienna, Austria, UNIDO. 152 p.
- Wood Resources International (WRI) 2005. Wood resource Quarterly, 3rd Quarter 2005. Available on line at: <http://www.woodprices.com/?gclid=CPLegYjLvYoCFQy9Sgod2jn3QA>, consulted February 2007.

3 A short socio-economic analysis on the stricter European regulations on tropical hardwood imports and their side effects

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Discussion – working paper

3.1 Abstract

In the paper presented in this chapter we analysed potential side effects of the stricter regulation on tropical log or timber imports. It considers the place of Europe within the global timber market, where Europe accounts only for a very limited share. It also explains the high selectivity of European markets, with its consequences. While tropical wooden furniture and other secondary processed products are not considered as timber here, their question is also discussed. The number of empirical studies specifically dealing with the side effects of EU regulations is limited, but the results are converging, showing that these regulations have a general adverse effect, contrary to the initial aim of promoting the sustainability of tropical timbers. These side effects are essentially to divert the trade towards countries with lower standards, and to add a burden on most of the producing countries which have already a set of comparative disadvantages for the production of legal or sustainable timber. The effects are positive on a limited number of companies which markets are very dependent of Europe. The question is then analysed from a broader perspective, replacing the effects of the EU regulations as an incidental factor compared to the increasing consumption of tropical timber by the three developing giants: Brazil, India and China.

3.2 Introduction

With a long history of concerns regarding the state and the sustainability of tropical forests, the European opinion has been in the recent years particularly awakened by several spectacular activist-events and campaigns organised by environmentalistic NGOs, which culminated around the years 2001 to 2003. Coincidentally, or probably as a result, several European governments decided to increase their own level of environmental requirements when purchasing tropical timbers for public markets, while some others are still pondering the opportunity of specifically addressing tropical timber trade (Gudbransen et al. 2006). Denmark has issued the first policy in this matter, in 2003, followed by UK in 2004 and France in 2006. Netherlands is still in the process to issue definitive guidelines. At least in Danish and British policies, the tendency is to use existing certification label like FSC or PEFC as a reference, while the terms of French and Dutch policies are purposely not directly favouring any specific label (Roda et al. 2006). All of these procurement policies are unilateral measures. Some international non governmental organizations are also in the

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process of developing systems that increase the trade of legal timber beyond that traded under the ecolabels. For example the WWF-supported Global Forest Trading Network (GFTN) has developed a responsible buying policy which is receiving increasing acceptance of entrepreneurial and public buyers. FSC has recently approved its new “controlled wood” standard, to be applied in cases where certified wood is mixed with non-certified wood, to make sure that the latter meets at least five basic requirements, among which the legal provenance of the timber.

Conversely and at a broader level, the European Union (EU) launched an action plan to restrict the amount of illegal timber entering the EU, by increasing the legal requirements on tropical timber imports (Communication from the Commission to the Council and the European Parliament 2003). Because of a necessary compliance with WTO regulations, and the need to avoid any unfair competition with temperate timbers or other materials which may not be submitted to the same requirements nor to the same production complexity, this action plan “Forest Law Enforcement, Governance and Trade” (hereafter referred to as FLEGT) is based on voluntary individual partnerships between the EU and producer countries, with assistance provided in exchange of the trade restriction, and the process is still in progress. Beside the nature of the various restriction measures, their recent and almost simultaneous development forms a continuum of actions which progressively hardens the regulation of wood imports.

All the actions by governments as well by NGOs started with the legitimate concern to promote a more sustainable management of tropical forests, and to combat the illegal trade of tropical timbers. The underlying hypothesis of all actions restricting regulations of tropical hardwood imports into Europe, is that these automatically and directly entail positive impacts on the global sustainability of tropical forests. But the reality of both the sustainability of the forests (see for example Geist and Lambin 2001) the impacts might be more complex, and these actions may have unexpected side effects. The purpose of this paper is not to discuss whether positive or negative aspects prevail in the impacts of stricter European regulation on tropical hardwood imports. Instead, it is to examine the global trade context of these regulations on tropical hardwood imports, and to discuss the hypothesis that they do have side effects, and if so, to analyse and discuss them.

3.3 The place of Europe within the world tropical timber market

3.3.1 Europe accounts for a very limited share of the world tropical timber consumption

After North America, Europe has traditionally dominated the world’s timber trade and timber consumption, as the second largest consumer of hardwood and softwood (Hashiramoto et al. 2004). But this picture of Europe, having a major impact on the global timber economy, is essentially due to the pre-eminence of temperate wood products in the European consumption, following the global pattern of the western countries (Roda et al. 2005). Regarding the world tropical timber market, it is a different story. Today, Europe⁵ represents a very limited part of the world consumption of tropical timber: less than 1% of the world tropical log consumption, and respectively less than 7 and 6% of tropical sawn timber and plywood world consumptions. The volume of logs and plywood consumed by Europe is decreasing since 1998, and stabilising in the last years. Meanwhile, the European consumption of sawn timber

⁵ Countries of the European Union, hereafter referred as “Europe “.

is fluctuant but not declining, because it is mainly based on some specific technical requirements which only some tropical species can fulfil (Figure 3.1). According to the calculations based on either FAO or ITTO sources, the overall European round wood-equivalent consumption of tropical timber is assessed between 3 to 6 % of the world consumption based on (ITTO 2006) and (FAO, 2007).

Thus the European footprint on the tropical timber production, through its own consumption, is relatively low at the world scale. It is already decreasing for a short decade in absolute value, and the share on a world scale is expected to further decrease in the future because of the steady consumption increases of Brazil, India and China. These three countries only, account for 45 to 50% of the world consumption of tropical timber in round wood equivalent, and their importance is increasing. Each of these countries consumes much more (4 to almost 8 times) than the whole of Europe itself, while their exports of the different timber products are excessively low compared to their consumption. Two other tropical countries with a different profile, because they are more export-dependant for some products, have a major importance at the world scale. That is Indonesia and Malaysia. These two other huge consumers (each consumes more than 3 times than the whole Europe itself) along with China, Brazil and India, form a cluster of tropical countries which accounts for 60% of the world tropical timber consumption. The patterns of their overall increasing consumption, influenced by their status of developing countries, are the real driver of the requirements for tropical timbers at the world scale.

Yet, while Brazil and India are mayor consumers of tropical roundwood, in China, India and other Southeast Asian countries a large part of processing takes place and a considerable amount of these products is then sold to Europe and the US.

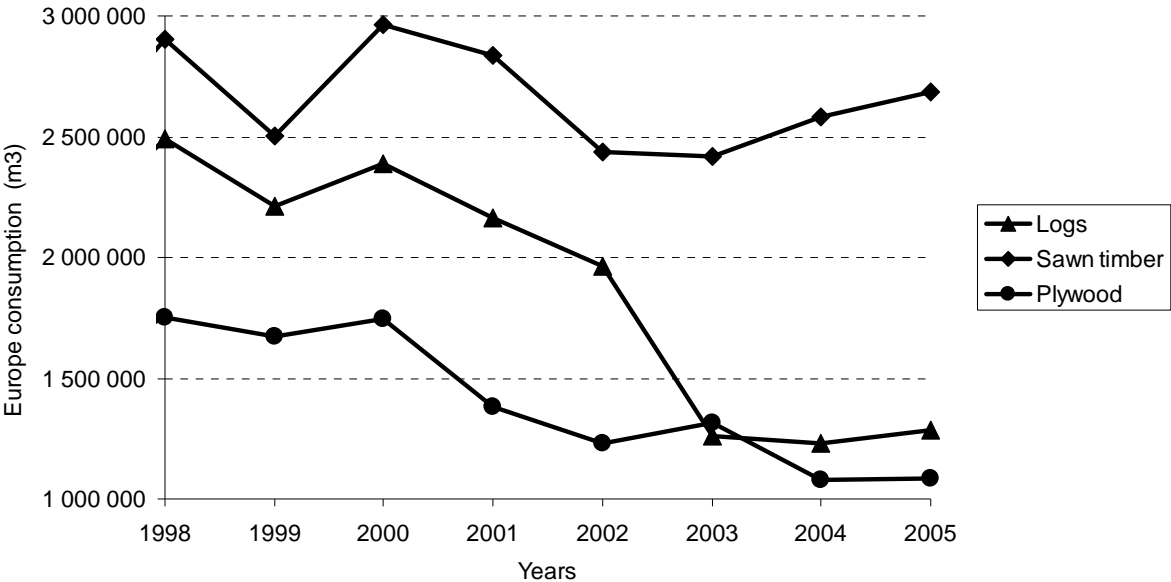


Figure 3.1 Evolution of European consumption for the main tropical timber products (source : Faostat)

3.3.2 The traditional influence of Europe in some African countries is challenged

Yet European demand patterns have still some influence in a few African countries like Ghana, Côte d’Ivoire, Cameroon, Gabon and Republic of Congo, but this also is challenged.

Traditionally, these countries were exporting their tropical hardwoods almost exclusively towards Europe. But for the last decade the volume and the share of their exports to Europe is progressively decreasing, while they have diverted their sales towards Asia. The most striking examples are from the Republic of Congo, which exports to Europe of logs, sawn timber, plywood, in Round Wood Equivalent, have decreased from more than 80% to less than 15% in the recent years (Figure 3.2). During the same period, Cameroon and Côte d'Ivoire have better resisted, and their share of export to Europe remained above 60% (FAO, 2007). It is interesting to note that despite different political situations and economic contexts, these two countries both benefit of well developed industrial and institutional tools which allow them to process a large share of their logs, and both present a high proportion of forest industries with European shareholding.

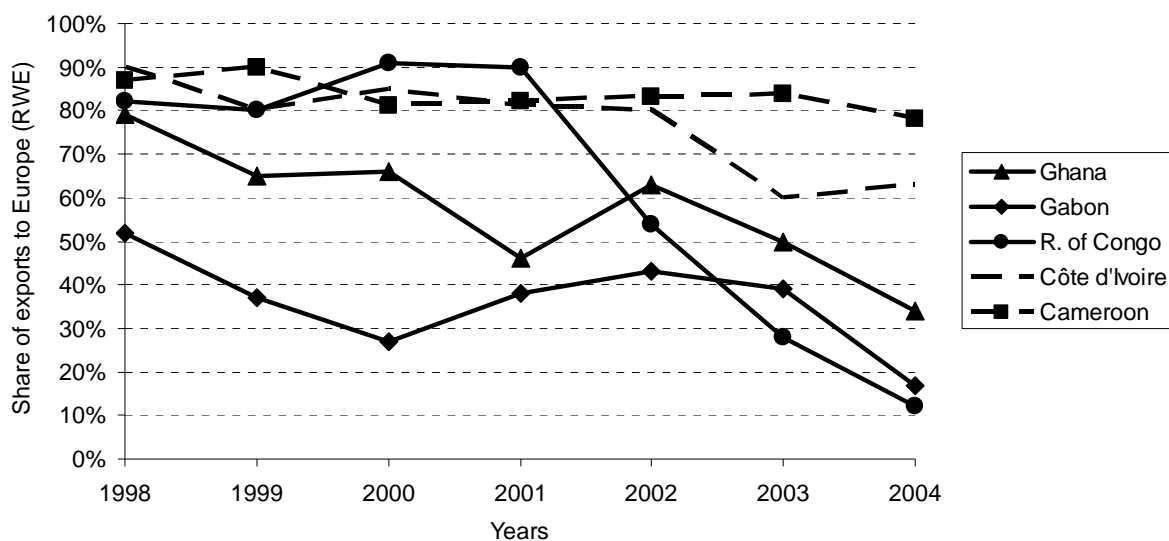


Figure 3.2 Evolution of hardwood exports to Europe of selected African countries (Sum of logs, sawn timber, veneer and plywood, in Round Wood Equivalents. Source : Faostat)

3.3.3 European markets are highly selective

Even if the opinion usually assumes that the European demand concerns mainly higher value timbers and thus have an impact on the economy of the timber production, its footprint in this regard is limited too. Actually, the European footprint is very high on certain specific tropical timbers, belonging to what can be called “niche markets” at the world scale, because of the specificity of the requirements (mainly regarding the delays of delivery, the logistics, the presentation and packaging of the products as well as their technical quality). These requirements make the production for European markets not so easy nor so profitable for developing economies, which explains why most of the critically export-dependant tropical countries (ie Gabon or Republic of Congo) are increasing the share of their timber sales towards Asia, although these markets are less profitable but they are also less demanding (Roda 2001a).

While the European consumption decreases, the selectivity of the demanded products is becoming higher. As a result, the gap between the requirements of European markets and the main markets is also increasing. Conversely, this phenomenon entails a higher dependence of the decreasing number of producing firms which are specialised into the European markets.

They become more sensitive to the fine-tuning of this demand, and their eventual ability or impossibility to fulfil all the requirements of this demand is becoming their main comparative advantage or impediment within the international trade of tropical timbers, which has become essentially regulated by the Asian and Latin-American producers (Sales et al. 2005).

3.3.4 Imports of furniture and other secondary processed wood products have probably a higher impact than timber imports

Despite the fact that furniture and secondary processed products (hereafter named as SPWP) are beyond the scope of the stricter regulations for timber, it is nevertheless interesting to consider it in brief. Indeed, while the European consumption of tropical round wood is slightly decreasing, the import of SPWP has increased over the last ten years, with Malaysian, Indonesian, and lately also Chinese producers being very active. Despite this progression, the tropical SPWP have been losing market shares in Europe, because of the increase of use of PVC products and temperate SPWP (FAO 2007).

We take here into account only the quantitatively significant SPWP, which are wooden furniture (wooden seats, kitchen, office, and other furniture), wooden joinery and carpentry, wooden frames, densified wooden profiles and blocks, and various mouldings and floorings⁶. There are neither statistical tools nor databases allowing assessment of consumption of the tropical SPWP at the world scale. The only way to quantify the importance of these products is the international trade, which gives distorted and exaggerated proportions compared to real consumption, since the wooden SPWP are assumed to represent a greater volume in the internal consumption of the producer countries, than the actual international trade.

According to the United Nations Commodity Trade database, the EU25 imported in 2005 15%⁷ of the value world imports of the main SPWP, but 22%⁸ of the value of the world imports of the main SPWP produced in tropical countries (United Nations 2007). Considering that China has become a major exporter of SPWP to Europe, the proportion could be as much as 27%⁹. Of course, one should keep in mind that these figures represent only the data registered in the UN database, not the real international trade, and that the real proportions of the consumption itself are probably much lower. This latest assumption is made on the basis of several empirical studies which suggest that in most of the tropical countries, the internal trade and consumption of forest products is much more important than the external trade (ITTO 2006, Roda 2001b, Roda 2004, Awang et al. 2003, Guizol et al. 2005, Muhtaman et al. 2006). Nevertheless, this suggests that SPWP may carry the impact on tropical forests of Europe consumption, while the European regulations on tropical hardwood imports have only limited impacts on the actual evolution of the tropical forests at the global scale.

3.4 Side-effects in the context of most of the producers

3.4.1 From strident comments to objective studies

With a rather strident judgemental tone, Bryant (Bryant 1999) pointed out the possible side-effects of stricter regulations on forest products: “industrialized countries have a propensity to

⁶ This refers to the products described by standardized international nomenclature HS1996 : Codes 440920, 4413, 4414, 4418, 940330, 940340, 940360, 940161, 940169.

⁷ That is approximately 8 100 000 000 USD, on 52 600 000 000 USD.

⁸ That is approximately 2 000 000 000 USD on 9 600 000 000 USD

⁹ Computed by CIRAD from the UN ComTrade database (United Nations 2007)

levy import restrictions in order to coerce developing countries into implementing sound programs [...] Developing countries can easily turn to secondary sources, such as their own markets, to fulfil their immediate needs [i.e. need of selling their products]”.

Since that time and this normative position, a few empirical studies have highlighted that, due to the relatively high gap between the relatively low demand of the countries imposing some trade standard, and the much greater demand of other countries with lower standards, the side-effects of stricter environmental regulations on timber imports were noticeable. In the specific case of the European stricter regulations set, there is a pair of convergent empirical studies (Indufor 2003; Roda et al. 2006), which are also convergent with an impact study regarding stricter import regulations outside Europe, in Australia, indicating similar results and side effects (Jacko Pöyry Consulting 2005).

Yet there are also positive side-effects, as some companies that introduced a more transparent system to verify origin of timber became more aware of ineffective operations and were able to solve these problems (e.g. in Peru, where sometimes logs were lost in transport from the forest). In other cases, companies had to become more efficient to remain competitive. Additionally, the need of some companies to show legal origin has led to pressure on governments to improve these aspects. Decentralization efforts also contribute to greater governance, supporting the efforts to increase legality of logging.

3.4.2 Convergence of two recent empirical works on stricter imports regulation in Europe

An impact assessment of the FLEGT process (Indufor 2003) has concluded that in the majority of tropical countries which have a very limited share of timber sales to Europe, the relatively generic EU regulation will probably have little effect on the promotion of sustainable forest management or against illegal activities. The positive impacts are expected to be found in only a few tropical countries which still largely depend on sales towards Europe. The EU regulations on timber are, however, expected to result in a leakage of export towards third countries with less strict regulations, and which resell finished products to Europe (Indufor 2003). Because the chain of custody of these finished products is much more difficult to identify than for timbers, there are currently no specific environmental regulations for their imports regarding legality of the harvests at their origin, or sustainable management of forests.

In France, an impact study of the new public procurement policy (with sustainable management criteria for timber) (Roda et al. 2006) showed that this regulation tool may have only a limited effect in promoting sustainable management in tropical forests. At the same time it is likely to encourage producers of tropical timber to divert their sales to other parts of the world than Europe. More in detail, this study reveals that, this regulation tool will have an important media impact. This will create a *de facto* segregation favouring temperate timbers as well as plantation timbers, because the offered quantities of these timbers complying with regulations is much more bigger than for complying tropical timbers from natural forests¹⁰. Furthermore, the French study finds that this procurement policy favours the large scale industrial producers in tropical countries, and disfavours small producers from the same countries. This last effect is due to the fact that, while the large industries are usually

¹⁰ According to Pinto de Abreu et al. (2005), the tropical forest today only represent 5% of the total available certified areas, which entails an unbalanced offer between temperate timbers and tropical timbers.

integrated and thus get certified or can prove the legality and the origin of the material with less difficulties or relative cost, while the local small and medium operators have less economic power to force their local suppliers to meet these requirements.

3.4.3 The broader perspective

While the above mentioned empirical studies essentially discuss the contradiction between the level of European requirements and the actual importance of the European market, it is also interesting to consider the offer of tropical products complying with the European stricter regulations, and its potential evolutions. The share of FSC certified production forests appears to be so far the only worldwide available index able to provide, in some extent, some basic indication on the potential ability to produce timber that will comply with a minimum level of environmental or legal requirements¹¹.

A recent empirical study, has confronted such FSC indicator with a range of market data (dependency of the producing countries on European markets and various timber products, market shares, and more than 200 other economic indicators (Wang 2006). It was expected that in a given country, the level of FSC certification would be related to the share of sales to markets with a high environmental sensitiveness. A factorial analysis of the extent of FSC certification showed, however, that more than 50% of statistical inertia was explained by only two factors: firstly poverty versus high standards of living¹², and secondly the potential budget that a national society (civil or public) could theoretically allow for financing the forest¹³.

These results reveal a structural relationship between the extension of FSC and the economic development of a country, but not with its sales to eco-sensitive markets. With a large group of the tropical countries significantly producing timber the being mainly poor countries, with low GDP or GNI/ha, it is likely that these countries are structurally unable to implement certification schemes at a large scale. Therefore it is likely that the stricter European regulations will only have a limited impact on the sustainability of tropical timber and forests.

The stricter regulations from EU side will only result in more sustainable wood being produced if accompanying actions are implemented to solve the problems of poverty, to promote economic development, and reduce the comparative disadvantages, which are the main underlying factors featuring the tropical timber production legality (Tacconi et al. 2003) or environmental quality (Roda 2006).

While at the same time, Brazilian, Indian, and especially Chinese consumptions are still exponentially growing (White et al. 2006; ITTO 2006; FAO 2007). This probably will continue to further level down the relative importance of the European market for tropical timbers at a world scale, with the risk that any positive impact of the European stricter regulations be outnumbered by the pressure of the markets of these developing countries. If not addressed properly the stricter European regulations could accelerate the disconnection of Europe and of the world tropical timber economy, which has already begun more than ten

¹¹ Among all the existing forest certifications schemes, only FSC is widespread both in temperate and tropical countries, and publicly displays the characteristics of each certified timber production under its scheme

¹² FSC certification is observed to a greater extent in countries which present high energy consumptions and development of transports, while FSC extension is limited in countries with high poverty indicators

¹³ That is, a unknown sum of money proportional to the GNI or the GDP of the country, relatively to the forest area of the country (GNI/ha or GDP/ha)

years ago (Roda 2000). Exceptions are a few big timber companies installed in the tropics, with European shareholding (Baudin et al. 2005).

3.5 Discussion

At a first level of analysis, the question of the side effects of stricter European regulations on tropical hardwoods imports appears as a quasi free competition example. With a very large demand for the products by many countries and segments of industry, an increase of market constraints imposed by one minor share of the demand (Europe) is sanctioned by a phenomenon of diversion of a part of the trade towards the larger share of the demand with lower requirements for the environmental or legal aspects of the production. This trade diversion very much complicates the promotion of better production practices in the countries of origin.

The focus in this paper is mainly on potential side effects of the stricter regulations that were not anticipated upon installation. Yet also other countries/regions tend to follow in implementing stricter demands for imported wood and, like for instance China, start looking internally towards better management. Europe in that sense, is leading by example. An important question, however, will be how FLEGT and environmental regulations are going to address paper and timber products that are from countries with a VPA, but processed in other countries, like for instance China. The eventual effect of these regulation could be further improved if these processed products would also be included. Yet, monitoring or certification of these chains of custody would become very expensive and problematic.

Also, there is more to it than only direct effects of the regulations or the small percent of timber that would be directly affected by the regulations. Even if a company only sells 5% of its timber to Europe or another responsible buyer (requesting certified or legal timber) it would mean that the producer will have to become more transparent over a much greater part of his operations. Because the whole chain needs to become transparent to be able to sell certified wood, in China an increasing number of processing plants have FSC certified their chains of custody (Auld et al. 2008), mainly to be able to serve the European and US markets. Increasing the amount of certified production in that case will relatively not be so costly. Additionally in Brazil exists an increasing internal demand for certified timber, and in other South American and Asian countries timber buyers begin to commit themselves to responsible buying policies. Finally, some countries feel the pressure from Europe to work towards a more transparent timber industry. Even with only a small volume of timber being exported to Europe and the USA, this usually amounts to a considerable percentage of the total production value and loosing that market may have serious influence on the local markets, dumping the better quality timber for low prices, reducing profitability of everyone (see for example the mahogany export ban in Bolivia in the late eighties, effect of discussion on mahogany export ban in Peru in 2005/6). As a result, governments are looking for increased monitoring capabilities and some companies look for independent means of verification of origin to secure access to European and US markets.

Only a very small part of offer and demand appears as a classical bilateral monopoly. It is the case of the few producing firms which are bound to the European market for structural reasons. These firms adapt their behaviour according to their market constraints and their production constraints (especially the difficult industrial context of developing countries). The increase of the market constraints might endanger some of these firms, but in the same time reinforce their niche, protecting them against the global competition.

At a second level of analysis, it is important to differentiate the nature of the various European regulations on tropical hardwoods imports. The unilateral regulations, as the national public procurement policies, only increase the market constraints for the firms from the tropical countries, without countermeasures to help the changes and reforms in a way that promotes economic development of these countries, or that reduces their comparative disadvantages.

Conversely the bilateral regulations propose measures to help the producers to meet the market constraints. FLEGT include actions in order to support governance reforms in the targeted countries, to support law enforcement tools, verification and monitoring, to better prepare them to work towards eco-certification, to make the actors aware of the necessity to export and import timber from legal sources, etc. The action plan also mentions support to community based forestry and customary rights of indigenous people. In the same time, FLEGT will have only a limited effect because the bilateral negotiations are currently only focused on a few countries, and regarding a very small share of the world tropical hardwood consumption.

Considering the limited efficiency of the existing regulations, as well as the relative importance of their side effects, it is worth to consider the parameters of the trade. While the European demand constraints are increasing, the producing firms, which are mainly located in developing countries with comparative disadvantages, can only play on their internal production constraints (organisation, efficiency, strategy of the firm itself). The limited leverage effect of the internal constraints, compared to the huge market with low levels of requirements, facilitates the trade diversion effect. Meanwhile the critical factors of the hardwood production are the political stability of the country, governance and corruption, infrastructure and industrial services. These factors are also essentially those which usually, along with the poverty, entail a low level of legality and sustainability of the hardwood productions. They form the external production constraints, and remain generally largely out of reach of the firm action, especially when the firms are of small size. Ideally, any strategy addressing legality of timber production should first plan actions tackling these constraints, or helping the firms to overcome it, prior to restrict the imports the European import regulations¹⁴. Yet potential actions depend very much on the willingness of the countries to improve in these fields and this willingness is limited if it is not coupled to economic benefits. In this sense, FLEGT should become the stick and import facilities the carrot for adoption of better governance, monitoring and control and reduced poverty actions.

Note

The literature on ecocertification side effects is also very interesting to consult, since the trade of tropical products timber markets for ecocertified products present many structural similarities with the trade of this kind of timber towards Europe. An interesting state of the art on the law aspects is given by Rehbinder (2003), while Van Dam (2003) provides a producing-country point of view on the economics of forest certification (Rehbinder 2003; van Dam 2003).

3.6 References

¹⁴ A complementing strategy could be to consider the question of SPWP, on which market Europe has a greater influence. But the real influence and the potential side effects, have still to be investigated.

- Auld, G., Gulbrandsen, L. H. and McDermott, C. L. 2008. Certification Schemes and the Impacts on Forests and Forestry. *Annual Review of Environment and Resources* 33:187-211.
- Awang, S., Guizol, P., Muhtaman, D., and Roda, J.-M. 2003. Strategy for sustainable development of furniture industries and teak forests in Java. Bogor, Indonesia: CIFOR, CIRAD, Carrefour, LATIN.
- Baudin, A; Flinkman, M, and Nordwall, H-D. 2005. Made in Italy, grown in the tropics? *ITTO Tropical Forest Update*; 15(3):20-21.
- Bryant, S.L. 1999. Environmental Labelling's Effects On The Timber Wood Industry [Web Page]. Accessed 2007. Available at: <http://gurukul.ucc.american.edu/ted/projects/tedcross/xtrop14.htm>.
- Communication from the Commission to the Council and the European Parliament. Commission of the European Communities. Forest Law Enforcement, Governance and Trade (FLEGT): Proposal for an EU action plan. COM ed. Brussels: COM; 2003; p. 32p.
- FAO. 2007. Markets for high-value tropical hardwoods in Europe. Food and Agriculture Organization of the United Nations. FAO Statistical Database [Web Page]. 2007. Available at: <http://faostat.fao.org/>.
- Gudbransen, L. H. and Humphreys, D. 2006. International initiatives to address tropical timber logging and trade - A report for the Norwegian Ministry of the Environment. Lysaker, Norway: The Fridtjof Nansen Institute.
- Guizol, P.; Roda, J.-M.; Muhtaman, D.R.; Laburthe, P.; Fauveaud, S., and Antona, M. 2005. Le teck Javanais, entre surexploitation et embargo. *Bois et Forêts Des Tropiques*. 284(2):11-22.
- Hashiramoto, O; Castano, J, and Johnson S. Changing global picture of trade in wood products. FAO Corporate Document Repository. Rome; 2004 9p.
- Indufor. Impact assessment of the EU action plan for Forest Law Enforcement, Governance, and Trade (FLEGT). Helsinki: European Commission Directorate General for Development; 2003.
- ITTO. Annual Review and Assesment of the World Timber Situation. International Tropical Timber Organisation, Yokohama, Japan
- Jacko Pöyry Consulting. 2005. An overview of illegal logging. Melbourne, Australia: Australian Government - Department of Agriculture, Fisheries and Forestry; 22p.
- Muhtaman, D., Guizol, P.; Roda, J.-M., et Purnomo, H. 2006. Geographic Indications for Javanese Teak ; A constitutional change. *Survival of the Commons : Mounting Challenges ans New Realities (the Eleventh Conference of the International Association for the Study of Common Property)*; Bali, Indonesia.
- Oliver, R., Fripp, E., and Roby, A. 2005 Wood products trade - Africa & Europe. Timber Trade Federation.
- Pinto de Abreu, J.A.A.K. and Simula, M. 2005. Setting the scene : Overview and implementation of phased approaches. 38 slides ITTO International Workshop on Phased Approaches to Certification; Bern. ITTO, Yokohama, Japan.
- Rehbinder, E. 2003. Forest certification and environmental law. in: Meidinger, E.; Elliott, C., and Oesten, G., Editors. *Social and Political Dimensions of Forest Certification*. Verlag, Germany pp. 331-352.
- Roda, J.-M. 2000. Etat de l'économie des bois d'oeuvre tropicaux 2000 - State of the tropical timber economics 2000. CIRAD, Montpellier, France.
- Roda, J.-M. 2001a. Ecocertification tropicale et idées préconçues. *Bois et Forêts Des Tropiques*, 4(270):108-109.
- Roda, J.-M. 2001b. Market analysis for Acrean timbers. ONFI-CIRAD, Montpellier, France;

- (Forest evaluation of the State of Acre, Brazil).
- Roda, J.-M. 2004. L'enclavement est-il une fatalité pour les industries du bois ? Elements de réponse à partir du cas de l'Acre (Brésil). *Bois Et Forêts Des Tropiques*, 280(2):68-72.
- Roda, J.-M. 2006. European new trends of public procurement policies for tropical timber: lessons from the French case, and global implications. International Tropical Timber Organisation; Merida, Mexico.
- Roda, J.-M.; Campbell, B., Kowero, G., Mutamba, M., Clarke, M., Gonzales, L.A., Mapendembe, A., Oka, H., Shackleton, S., Vantomme, P. and Yiping, L. 2004. Forest-based Livelihoods and poverty reduction: new paths from local to global scales. In: Mery, G., Alfaro, R., Kanninen, M. and Lobovikov, M. *Forests in the Global Balance - Changing Paradigms*. IUFRO, Helsinki. pp. 75-96.
- Roda, J.-M.; Rathi, S., and Simula, M. 2006. Elaboration d'une méthode de suivi des objectifs et impacts de la circulaire et scénarios futurs d'évolution du dispositif prévu par ce texte (Rapport de la phase 3 de l'Etude de différents scénarios d'introduction d'une écoconditionnalité dans les achats publics de bois tropicaux). CIRAD, Montpellier, France.
- Sales, C., Rathi, S. and Roda, J.-M. 2005. The world and the Asian market. ATIBT Forum, Shanghai, China
- Tacconi, L., Boscolo, M. and Brack, D. 2003. National and international policies to control illegal forest activities. Bogor, Indonesia: CIFOR; 2003.
- United Nations. 2007. United Nations Commodities Trade database [Web Page]. Accessed 2007. <http://comtrade.un.org/db/default.aspx>.
- van Dam, C. 2003. The economics of forest certification - sustainable development for whom? In: *The Latin American congress on development and environment "local challenges of globalisation"*. FLACSO. Quito, Ecuador.
- Wang, W. 2006. Exploration des liens entre l'écocertification des forêts tropicales, et le risque pays, ainsi que d'autres facteurs de développement humain (Master Thesis).: Ecoles Supérieure du Bois, Nantes, France.
- White, A., Sun, X., Canby K., Xu, J., Barr, C., Katsigris, E., Bull, G., Cossalter, C. and Nilsson, S. 2006. China and the global market for forest products; transforming trade to benefit forests and livelihood. CIFOR, Indonesia.