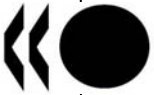


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Round Table on Sustainable Development

THE ECONOMICS OF ILLEGAL LOGGING AND ASSOCIATED TRADE

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TABLE OF CONTENTS

SUMMARY	4
PART I: ILLEGAL LOGGING DESCRIBED	7
1. Introduction	7
2. The Importance of Forests	7
2.1. The Extent of Forest Resources	7
2.2. Biodiversity	9
2.3. Landscapes, water and soil resources	10
2.4. Carbon stocks and climate change	10
2.5. Forests and livelihoods	10
2.6. Pressures on forests will remain high	10
3. The Market for Forest Products and Illegal Logging	11
3.1. The Market for forest products	11
3.2. Illegal logging - what is it?	15
3.3. How important is it?	16
3.4. Who are the main actors?	17
3.5. What are the consequences of illegal logging? Who loses and who benefits?	18
4. Incentives for illegal logging	19
4.1 The lure of financial profits	20
4.2 Imbalances between industrial supply and demand	21
4.3 Information and knowledge limitations	21
4.4 Failures of the law	22
4.5 Limitations of government agencies	22
4.6 Corruption	23
4.7 Inadequate safeguards relating to developments in other sectors	23
PART II: STRATEGIES TO COMBAT ILLEGAL LOGGING	24
5. Strengthening law enforcement and governance in producer countries	24
5.1. Forest Law Enforcement and Governance (FLEG)	24
5.2. OECD Anti-Bribery Convention	27
6. Options for controlling the international trade in wood products	27
6.1 International agreements to control trade in wood products	27
6.2 National measures to control imports	29
6.3 Chain-of-custody as a prerequisite to controlling international trade	30
REFERENCES	33
ANNEX 1: ILLEGAL FOREST PRACTICES	36
ANNEX 2: OTHER INTERNATIONAL INITIATIVES	37
ANNEX 3: INDUSTRIAL ROUND WOOD STATISTICS	40

SUMMARY

Global deforestation continues at an alarming rate. Each year an area of forests the size of Greece is lost, threatening irreplaceable biodiversity with extinction and contributing to global warming. Most gains from this destruction of natural capital are modest and short-lived. There are compelling reasons why national governments of forest-rich countries and the international community as a whole must take decisive action to conserve forests and increase investment in sustainable forest management.

Why are forests and illegal logging a cause of concern?

Much of the deforestation that takes place in the tropics is wasteful and induced by illegal logging. The characteristic of forests as a global public good means that their biodiversity, carbon storage and other environmental values are not adequately priced in international markets. The absence of well-defined or enforced property rights encourages the destruction of natural resources in return for short-term gains that discount or completely ignore long-term economic and environmental dividends. It allows a few people to benefit at the expense of many. Illegal logging is responsible for a loss of public assets in developing countries in excess of US\$10 billion annually to which must be added an additional US\$5 billion annually in lost taxes and royalties.

Why and on what scale does illegal logging happen?

Deforestation and illegal logging are closely linked. In many cases illegal logging acts as a catalyst for forest land conversion to other uses. Illegal behaviour is more likely to take place when the benefits derived from violating the law exceed the cost of non-compliance. In other words, when the expected net costs of operating legitimately are higher than those facing clandestine operations, illegal clearance will continue.

The cost differential between legal and illegal production depends on the characteristics of the markets for wood products. Of global wood removals, 40% is used for basic energy needs such as cooking and heating and 60% is used as industrial round wood. In tropical regions wood removal for fuel wood can be as high as 80%. This suggests that illegal logging for fuel wood will only be decreased if and when adequately priced modern energy alternatives become available in combination with effective poverty alleviation policies.

Around 30% of wood removal for industrial round wood takes place in high-risk countries. High risk countries are defined here as China, Russia and all countries in tropical regions. Reliable studies estimate the extent of illegal logging in these high-risk countries to range between 20% - 90% of production, with the median being around 40%. In some countries the extent of illegal logging will also vary significantly between different regions within the same country. China is defined as 'high risk' here because it has become the world's largest wood workshop, importing primarily from tropical regions and Russia and re-exporting to OECD countries.

While it is extremely difficult to estimate total trade in both primary but in particular secondary processed wood products, it seems that on average, in high risk countries roughly 50% of total industrial round wood removals is exported either as primary processed products (70%) or as secondary processed products (30%)¹. This implies that high-risk exports amount to approximately 15% of total world-wide industrial wood removals per year.

What can be done to strengthen measures to combat illegal logging?

Measures that tilt the marketplace in favour of legal as opposed to illegal products must clearly address those factors on the supply and demand side that can positively influence the price spread between legal and illegal operations:

- supply side measures should *increase the risk of punishment* of illegal behaviour in producer countries and equally importantly *decrease the cost of producing legally*.
- demand side measures should *reduce the financial reward* of producing illegally by influencing product prices and access to markets, including international markets, in order to discriminate between legal and illegally sourced wood products.

Measures on the supply side

On the supply side it is not advisable to focus on a few measures as there are no easy wins. Policy strategies need to be coherent and comprehensive. Nevertheless we highlight three issues that stand out as crucial across countries and regions.

The first is to determine clearly who has rights over the forest and how effectively those rights are enforced. While situations may vary from country to country, in all circumstances clear allocation of property rights, definition of the accompanying legal rights and responsibilities of landowners as well as effective enforcement are needed to prevent forests from overexploitation.

Second, better publicly available information is needed to reduce corruption and improve transparency and accountability of government decisions and the operations of logging enterprises. This especially holds for bidding procedures for forest concessions, the rules that apply to concession areas and related financial transactions. Modern forest monitoring and surveillance technologies make detection of unauthorized activities a relatively easy task.

A third issue is to create incentives for legal logging by making it easy and affordable to manage the forest sustainably. Laws must not be too complex and tax and royalty systems must be designed to reward sustainable practices. Raising the costs for legal production and trade could have perverse and unintended impacts.

Controlling international trade, measures on the demand side

An effective certification and/or licensing system is an essential prerequisite to controlling international trade in wood products in order to distinguish legal from illegal products.

Developing an effective chain-of-custody control that tracks wood products from the forest through to finished products is a difficult task for several reasons. Wood is processed into many different products and sourced from many different wood species, origins and owners. Hundreds of mills operate in the forest products industry using constantly changing sources. Shipping documents are easy to falsify and the laundering of illegal products through trade between countries is also relatively easy without strong co-operation and communication between custom offices.

A global multilateral agreement on a licensing scheme for wood products would be the most effective way to control trade and prevent illegal wood entering the international market. A key question is whether the cost of such a licensing scheme would outweigh the benefits to the forest. There is also the question of how long it would take to negotiate, and whether there's any realistic prospect of one being agreed. When only around 50% of wood products are internationally traded licensing may only cause illegal products to

be directed to indiscriminating or domestic markets while licensed products are directed to the international market.

On the other hand, when consumer demand for sustainable produced products is high enough, producers will be more inclined to licence their products as this will help increase their market share. Once a licensing scheme is in place the marginal costs of using it for all production will be small. In this way the international market could provide an incentive to produce legally on the domestic market as well. Although the costs of licensing schemes vary considerably between countries and companies and their implementation is therefore certain to raise some equity questions, those costs generally are a relatively small part of total production costs.

If a multilateral agreement is deemed too expensive or difficult to achieve, could bilateral or regional voluntary agreements provide a useful alternative? Should this be seen as the best alternative route to a multilateral agreement or is a bilateral agreement valuable in itself?

The evidence to date suggests that the effectiveness of such schemes is ambiguous. To be effective, all imports to a country or all exports from a country should be addressed. Otherwise it will always be possible to launder illegal products via third countries or circumvent the voluntary scheme in other ways. Secondly, both primary and secondary processed wood products must be included as otherwise there always will be an incentive to displace processing industry to third countries.

For a country to require proof of legality for all imports it is important to treat domestic and international products alike in order to avoid a breach of WTO rules. The question again arises whether the costs of these additional requirements outweigh the benefits if only limited imports come from high-risk countries.

To give producer countries an incentive to license all their exports, there must be a market that favours legal products above products from suspicious or unknown origin. Although there are some encouraging signs, the willingness to pay a premium price, if any, remains uncertain. This is where the procurement policies of both governments and private companies can play an important role. Governments could act as a launching customer to create sufficient demand for certified products to increase their price. This will encourage increased supply, which in turn creates an incentive for the promoters of certified products to raise consumer awareness of them.

This paper outlined the nature, magnitude and consequences of illegal logging in forest-rich producer countries and the programmes on both the supply and demand side being implemented to reduce this problem. A vast amount has been written about this phenomenon. The general consensus is that the prevalence of illegal logging is a manifestation of deep governance weaknesses and that its effective control requires actions that are both complex and need to be carried out by a broad array of actors, including governments of producer and consumer countries, the forest industry and civil society. All expert advice advocates escaping the narrow field of action of the forest sector to include actions in other fields of government activity, such as land use policies, customs and police.

While this makes eminent sense, simply affirming the complexity of a problem can run the risk that no-one will be prepared to assess the overall impact of the totality of interventions. Acknowledging that a problem defies a single solution must not be allowed to be an excuse for a lack of priority setting or a dilution of efforts to remedy the problem. For that reason it is important to stress that actions by producer countries will always be the most effective in tackling forest crime as illegal logging takes place on their territory and stopping it is in their direct interest. Importing countries and the wider global community concerned to preserve the global public good elements of maintaining forest cover should keep this to the fore in developing their responses and assistance strategies.

PART I: ILLEGAL LOGGING DESCRIBED

1. Introduction

1. The rich forests that once covered half of the surface of the earth are being replaced by landscapes of forest fragments, tree plantations, agricultural crops and pastures. Much of the forest that still remains is being degraded. Tropical forests are being lost at a fast rate, some 5% during the last decade, with grave consequences for the global environment. Deforestation destroys habitats, leads to irreversible losses of biodiversity, deprives governments of billions of dollars in lost revenue, has negative impacts on agricultural productivity and is responsible for at least one-fifth of greenhouse emissions. Deforestation also affects the livelihoods of millions of the rural poor.

2. Logging for industrial wood products is a key cause of global deforestation. Much of this logging takes place in violation of laws designed to protect forests against indiscriminate cutting. The illegal extraction and trade in wood is a multibillion dollar phenomenon documented in more than 70 countries (Seneca Creek, 2004). The pervasiveness of illegal logging is to a large extent a manifestation of poor governance in the countries where it takes place.

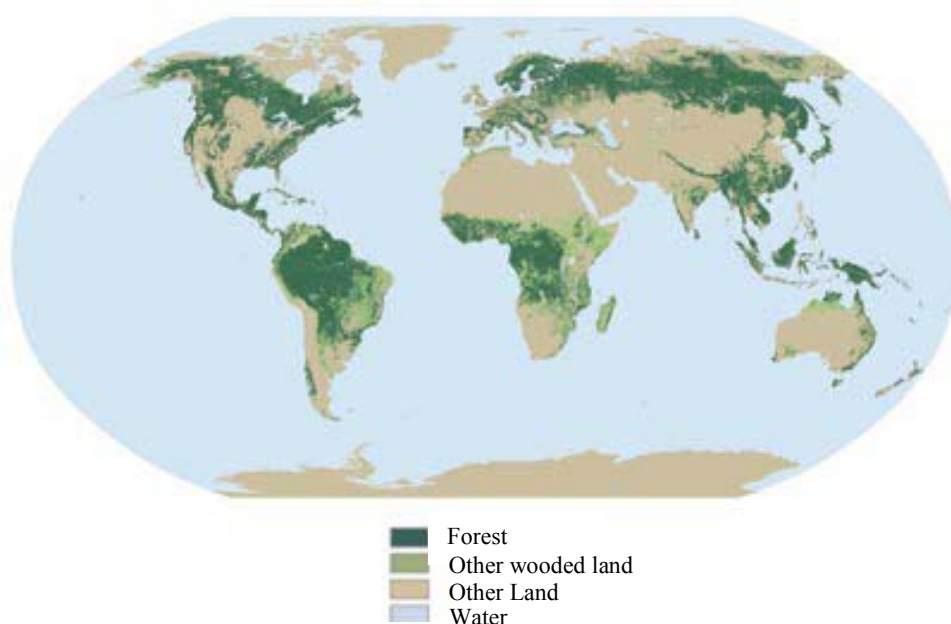
3. This paper provides a perspective on the illegal logging issue. It describes how illegal logging takes place in affected countries, looks at the incentives that induce illegal loggers to engage in this practice and at the consequences of allowing it to continue. It also examines the various national and international initiatives launched in the last few years to combat illegal practices and offers a preliminary analysis of their prospects. Finally, the document suggests themes that require further analysis and discussion.

2. The Importance of Forests

4. Forests are the richest ecosystems in biological wealth. They exert key influences on the Earth's climate and on the stability of human habitats. They conserve landscapes, soil and water resources and provide key services and products for the livelihoods of millions of the rural poor. Forests contribute to the economies of many countries, to income and local employment. The following sections describe the extent of global forest resources and their management and examine some of their most important economic and environmental functions in more detail.

2.1. *The Extent of Forest Resources*

5. The remaining forests cover about 30% (4 billion hectares) of the Earth's land surface (FAO, 2005). They are divided about evenly between non-tropical (boreal and temperate) and tropical forests. At the same time, they are unevenly distributed with only ten countries accounting for two-thirds of the total forest area (Table 1). Tropical forests extend around the Equator in Central and South America, central Africa and South-East Asia. The boreal and temperate forests are found in higher latitudes. The largest extensions of biodiversity-rich moist tropical forests are mainly in the Amazon Basin, but the American tropical forests extend north into Central America and Mexico. In Africa, tropical forests dominate the Congo Basin while in South-East Asia they are found through the islands, the Malay Peninsula, north through the Mekong Basin to south China and towards the Indian peninsula (See Figure 1).

Figure 1. The world's forest

Source: FAO Global Forest Resource Assessment 2005

Table 1. Forest area

<i>Region/country</i>	<i>Forest area (mln ha)</i>	<i>% of global forest area</i>
Europe	1 001	25.3
<i>of which Russian Federation</i>	809	20.5
South America	832	21.0
<i>of which Brazil</i>	478	12.1
<i>of which Peru</i>	69	1.7
North and Central America	706	17.9
<i>of which Canada</i>	310	7.8
<i>of which United States</i>	303	7.7
Africa	635	16.1
<i>of which Dem Rep of Congo</i>	134	3.4
Asia	572	14.5
<i>of which China</i>	197	5.0
<i>of which Indonesia</i>	88	2.2
<i>of which India</i>	68	1.7
Oceania	206	5.2
<i>of which Australia</i>	164	4.1
World	3 952	66.3

Source: FAO (2005)

6. Some of the world's forests are actually expanding. In the temperate and boreal parts of Europe and China, the area covered by forest is increasing through plantations and natural regeneration, but in other regions, mainly the tropics, deforestation is considerable. Between 2000 and 2005 deforestation has

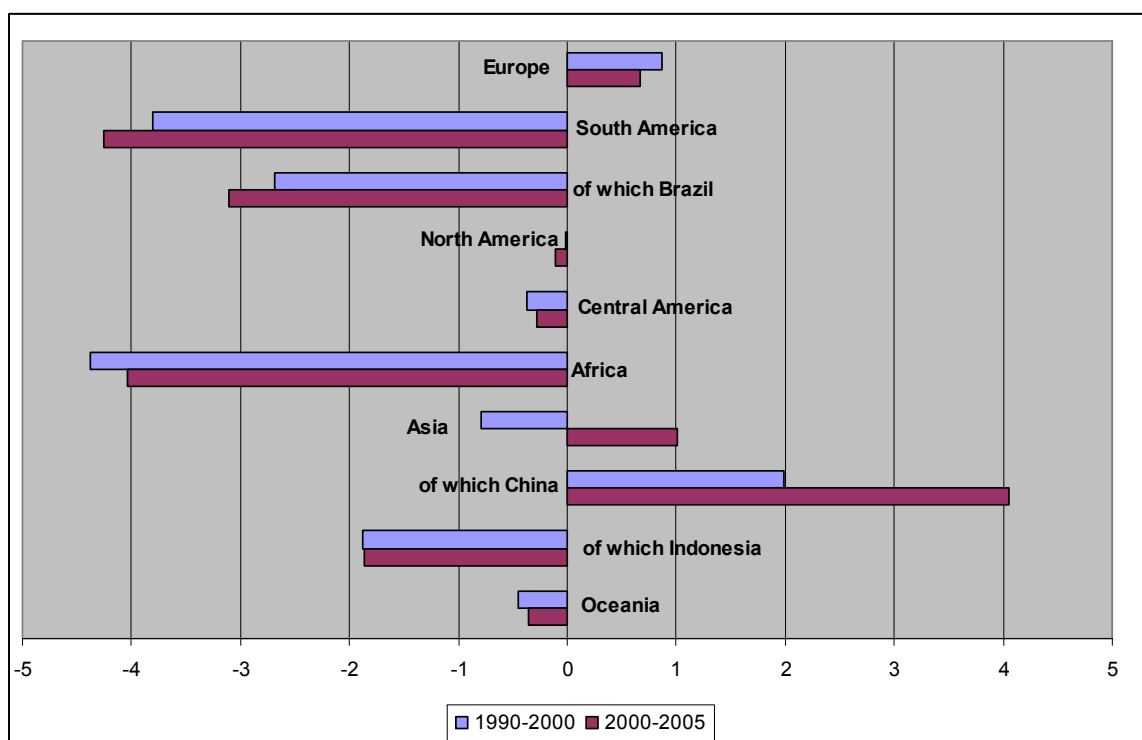
claimed some 13 million hectares per year, or an area as large as Greece. Figure 2 shows the global net change in forest area for different regions. Deforestation is particularly problematic in the Amazon, central Africa and South-East Asia. It is concentrated in ten countries (Brazil, Indonesia, Sudan, Myanmar, Zambia, Tanzania, Nigeria, Congo, Zimbabwe and Venezuela). On the other hand, forest areas have expanded in China, India and Vietnam, which makes the total balance for Asia slightly positive for the period 2000-2005² (See Figure 2).

7. Much of the deforestation is wasteful and induced by illegal logging. This is causing a continuous loss of the economic rents and environmental services that forest resources provide.

2.2. Biodiversity

8. Forest habitats are among the most biologically diverse ecosystems on Earth. In particular, tropical forests are unique in their diversity, containing two-thirds of all species. Brazil, for example, has some 7,800 species of flora and fauna. This genetic bank provides the building blocks for selection and breeding of plants and animals and enhances forest productivity for a number of uses, including medicines. Scientists have identified more than 2,000 tropical forest plants that have anti-cancer properties. Only a small part of this biological wealth has so far been tapped for human benefit. Illegal logging and deforestation threaten the potential of these genetic resources, a loss that is irreversible. Continuing the present deforestation path will place many more species under the threat of extinction as humans destroy their habitat³. Unfortunately, as mentioned, deforestation is highest in tropical areas where the biodiversity value is also the highest.

Figure 2. Annual net change of forest area in million hectares



Source: FAO (2005)

2.3. *Landscapes, water and soil resources*

9. Forests stabilise the landscape. They save soils from erosion, reducing sedimentation, protecting river basins and coastal areas. They have an influence on the chemical composition of underground water and of streams and lakes and play an important role on nutrient cycles, thus influencing water pollution and the productivity of agriculture and fisheries. Trees absorb and store some chemical elements such as nitrogen, magnesium, potassium, phosphorous and calcium, preventing them from being leached into streams. They influence water cycles by circulating humidity from land into the atmosphere. Because of their effects on soils and water, forests are important for agricultural production. Although the impacts are primarily local they can often be felt tens or hundreds of kilometres away.

10. Deforestation induced by illegal logging results in the loss of these environmental functions of forests. Deforestation has been behind landslides and large-scale loss of property and human lives in, for example, the Philippines and Thailand (World Bank, 2006).

2.4. *Carbon stocks and climate change*

11. The effect of forests on climate is important. Forests contain as much as three times the total amount of carbon that is in the atmosphere and every year they process between 15 and 20% of that total. However, deforestation releases CO₂ back into the atmosphere and is the main source of emissions from land use change. In recent years deforestation has been responsible for at least one-fifth of global CO₂ emissions and is by far the most important source of green house emission from developing countries (Peskett, Brown and Luttrell, 2006). This is more than the amount produced by the whole of the global transport sector (Stern, 2006).

12. The net effect of deforestation on the level of emissions of greenhouse gases depends on the density of the forest being cut down or burnt and the kind of vegetation that will develop in the deforested areas; some types of replacement vegetation capture more carbon than others. Planting new trees removes CO₂ from the atmosphere, but it takes these new trees far more time to absorb the same amount of carbon that is instantaneously released into the atmosphere when mature trees are burnt. The largest emissions from deforestation arise when land is converted to agricultural production; especially when slash and burn techniques are used. Log extraction is not of itself responsible for large emissions; when the logs are used in furniture making, carbon will remain stored. In the case of selective logging for industrial use, emissions are limited to the CO₂ impact of any soil disturbance and damage to non target species. This depends on the particular extraction techniques that are used.

2.5. *Forests and livelihoods*

13. Natural forests provide key products for the very poor (living on less than US\$2 a day) all over the world, but particularly so in the tropical regions. Almost 70 million people live in remote areas of closed tropical forest and another 735 million rural people live in or near such areas, relying on the forest for many of their daily needs (World Bank, 2006). In developing countries forests provide a source of wood, vines, bamboo and other materials for construction of homes and agricultural buildings as well as fruits, nuts, mushrooms and wild meat for food. They are a source of energy in the form of fuel wood for some 2 billion people. In developing countries tropical forests are almost exclusively the source of medicines for the poor.

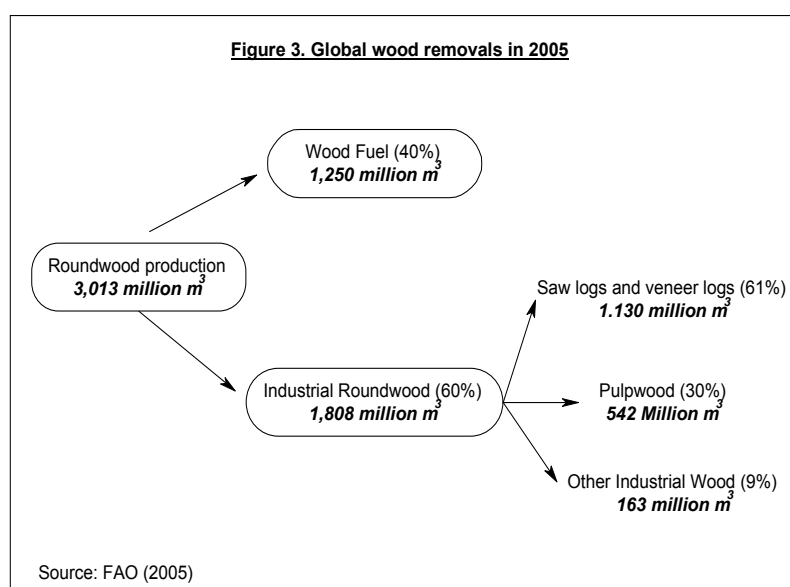
2.6. *Pressures on forests will remain high*

14. Most deforestation leads to the conversion of land for agricultural production, cattle ranching or the establishment of commercial tree crops such as palm oil plantations. Frequently, commercial logging is the catalyst for this clearance. First, loggers build penetration roads into the forest to reach their timber

volume. In countries where the rural poor lack access to land and the rule of law is weak, landless peasants follow behind loggers and clear the land for subsistence production. Second, degradation resulting from selective logging often makes alternative uses of the land a more attractive option. Thirdly, the value of logs will often be used as a credit mechanism to finance the initial capital cost of deforestation and make the land suitable for commercial tree crop plantation or ranching.

15. The pressure on forests in the last decades has been high. It will most likely remain high in the future. The continuing growth in the world population and rising income levels will increase the demand for agricultural, energy and timber products. FAO envisages croplands in the developing world expanding by 3.8 million hectares a year over the coming three decades (0.10% of total forest area). Much of this is likely to be at the expense of forests (Bruinsma, 2003). Increased production of feedstock for the production of bio-energy will result in pressure on the forest as well⁴. About 14 million hectares of land are currently used for the production of biofuels. In the IEA reference scenario, this rises to 28 million hectares in 2030. If new policies are adopted that stimulate biofuel production this may increase to 49 million hectares in the same period; an area the size of Sweden (IEA, 2006).

16. While much of the additional demand for industrial roundwood will be satisfied with recycled materials, wood from plantations and industrial efficiency, the pressure on the natural forests of developing countries is expected to grow further. Various projections of annual demand for industrial roundwood indicate that by 2050, demand may reach some 2.5 billion cubic metres as compared to 1.8 billion cubic metres today. For example, eight out of every ten persons in the world have yet to achieve the levels of paper consumption normally associated with meeting basic literacy and communication requirements.



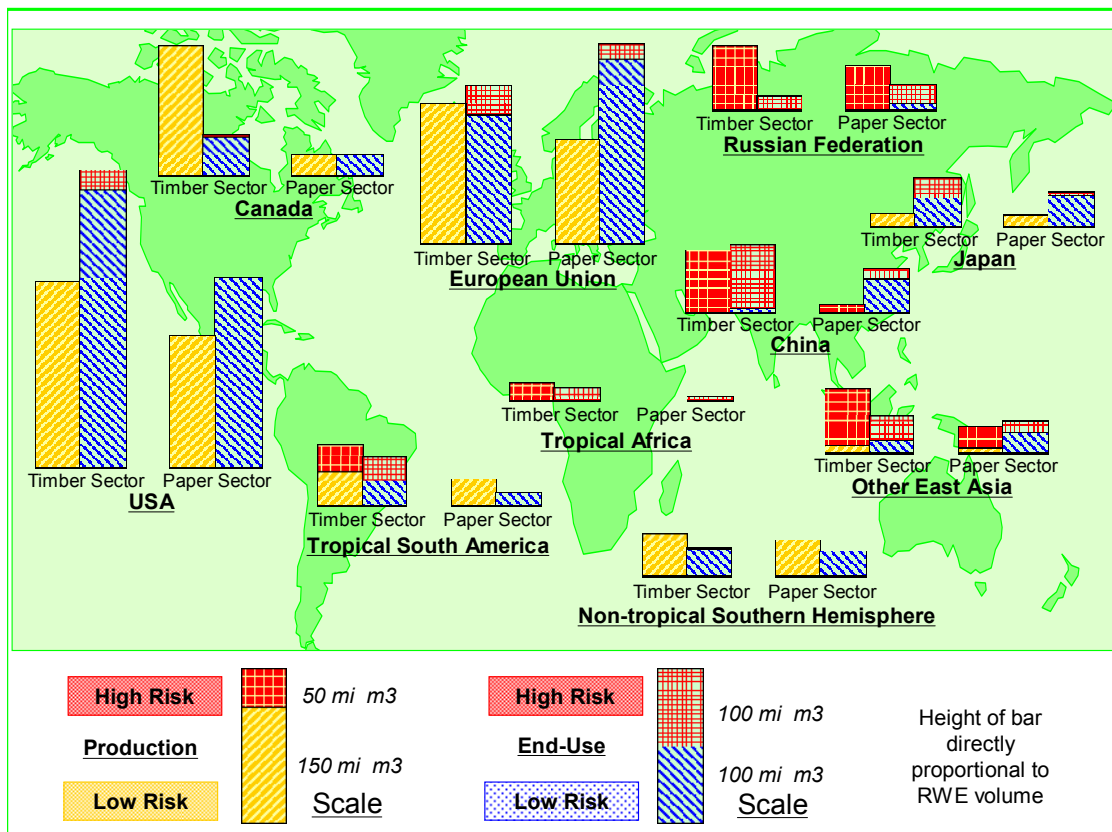
3. The Market for Forest Products and Illegal Logging

3.1. The Market for forest products

17. The forest products sector is estimated to contribute about 1% of world GDP and accounts for about 3% of international merchandise trade. From the total amount of round wood felled globally, 40% is used for energy purposes and 60% is used as industrial round wood (Figure 3). These averages hide a large difference between tropical and temperate and boreal forests. In tropical areas, most of the wood extracted from natural forests, up to 80%, is consumed as fuel wood, while in temperate and boreal areas fuel wood amounts only to around 20% of the total. The analysis in this section does not consider production and trade in fuel wood. The market for fuel wood, although very important in terms of volume, is so markedly different from that of industrial round wood that they can not be analysed together. Only 2% of total fuel wood production was traded between countries in 2003 (FAOSTAT).

18. Production and end use of industrial round wood primarily takes place in Canada, USA, EU and Japan. Together, these countries are responsible for around 60% of total production and 70% of end use consumption (see Figure 4). For reasons outlined below, all countries in tropical regions, as well as China and Russia, are regarded as high risk countries in which the percentage of production that is of suspicious origin is deemed significant. These countries are in broad terms responsible for a further 30% of total production and 20% of end use consumption. Globally the paper sector accounts for around 30% of total industrial round wood production whereas saw and veneer logs and other industrial round wood accounts for the other 70%.

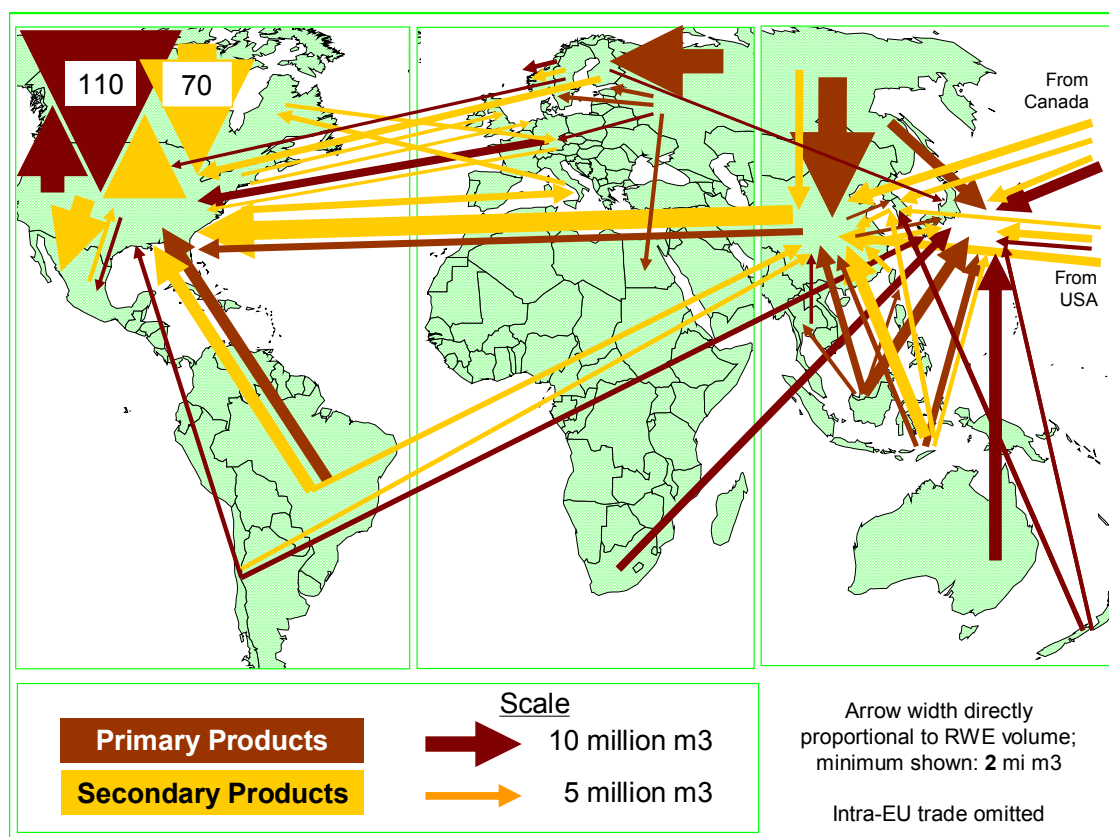
Figure 4. Production and End Usage of Timber & Paper Sector products (Low and High Risk, 2005)



Source: James Hewitt, based on calculations commissioned for this paper. UNECE (2006) and ITTO (2005) are the default data source for most of the production statistics. The data is cross checked and complemented by national sources and FAO (2005). Estimates have been made where suitable data has not been found. Annex 3 gives the underlying data and further information on the methodologies used for making the estimates. Round wood equivalent volume of secondary products made in any given country has been estimated by assuming that secondary products account for between 10 and 40% of total end use depending on the country⁵. Imports are deducted from and exports are added to the resulting estimate of end use in order to determine production of secondary wood products.

19. As consumption is much higher than production in the USA, EU, Japan and China, these countries are the biggest net importers of wood products and overwhelmingly dominate forest trade (see Figure 5). The USA is by far the world’s biggest net importer but sources its wood mainly from Canada. At the global level, 45% of imports are primary products and the remaining 55% secondary processed products. The trade in secondary processed products is dominated by the paper sector.

Figure 5. Major trade flows (Primary and Secondary Products, 2005)



Source: James Hewitt, based on calculations commissioned for this paper.

20. Only 20% of total trade in 2005 was with high risk countries. However, with markets in China and India expected to play a rapidly growing role in world trade in years to come this picture might change substantially. Between 1997 and 2005, China's total forest product imports more than tripled in volume and more than doubled in value⁶. It now represents 7% of total imports of wood products, but more importantly it imports 40% of all wood products supplied by high-risk countries, especially from Russia and Indonesia. The increase is a reflection of China's increasing consumption and the rising international demand for low-cost forest products manufactured in China in combination with China's inability to meet this rising demand through increased production from its own forests. As a result, China has become the world's largest wood workshop, responding to a growing demand for furniture, plywood, wood mouldings and flooring, particularly in the developed world. The quantity of timber which is processed and exported is estimated by White et al (2006) to be equivalent, in terms of volume, to over 70% of the timber imported by China.

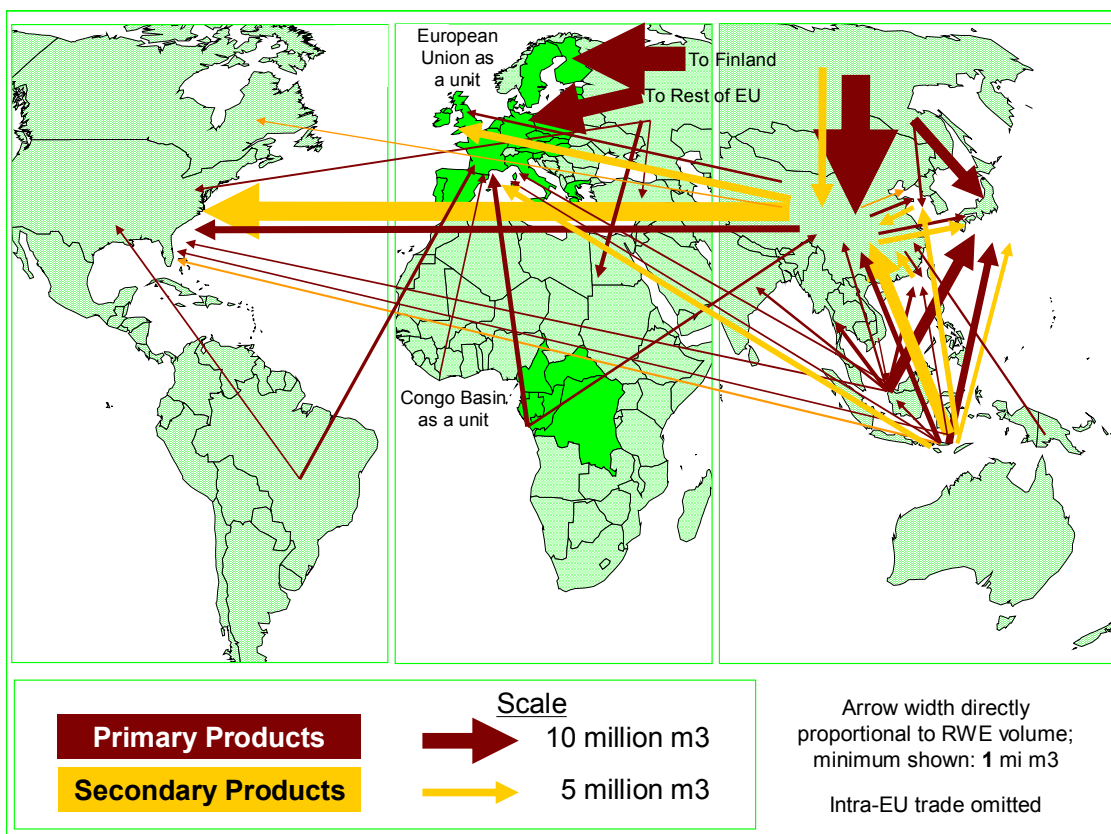
21. To assess the relevance of trade flows for logging in high-risk countries it is important to take into account both primary and secondary processed wood products. Primary wood products are used to produce other products such as joinery, flooring, paper and furniture that are internationally traded. Many countries tend to favour exports of processed industrial forest products and discourage exports of non-processed products. Some impose outright bans on the export of logs. In order to know where wood being logged is finally consumed the trade in secondary-processed wood products must be taken into account (Figure 5). Unfortunately, it is difficult to trace this directly from most trade statistics as they are only published in value terms. To get a rough estimate of the relative importance of primary and secondary

traded wood products, James Hewitt was commissioned to make some calculations for this paper. Figures 4 – 6 are based on this work.

22. As the focus of this paper is on illegal logging, it is most interesting to focus on the high-risk trade flows as shown in Figure 6. This shows that while high-risk supplies are predominantly coming from Russia, China, Indonesia and Malaysia (in that order) the demand for these supplies is coming primarily from the EU, Japan and the USA together with China (the estimated percentages may be found in Annex 3). Some of the more interesting observations include the following:

- Tropical wood products are primarily directed to China and Japan and to a lesser extent to the EU and USA.
- Africa (the Congo Basin) and Brazil are, in terms of the volume of tropical wood exports, much less significant sources than Indonesia and Malaysia.
- Russian exports to Europe are dominated by the Finish Paper sector.
- The USA mainly imports secondary wood products from China.

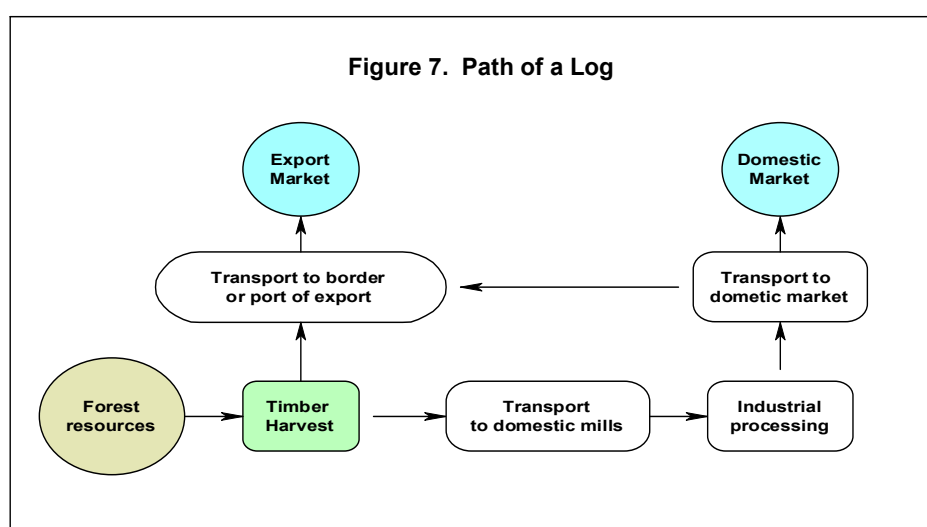
Figure 6. Major High Risk trade flows (Primary & Secondary Products, 2005)



Source: James Hewitt, based on calculations commissioned for this paper. Annex 3 gives more detailed information in some additional charts.

3.2. *Illegal logging - what is it?*

23. Wood is harvested for different purposes and by different operators. Wood can be cut and used without further processing as fuel wood or construction material for rural buildings, or, particularly if it comes from high value species such as mahogany, it can be sold directly as wood in the round in national markets or exported. Round wood can be transported to mills for industrial processing, for example to produce sawn wood or a variety of wood-based panels such as plywood, veneers and fibreboard. In turn, these industrial products can be sold in the domestic or the international market. In virtually any of these stages of production, transport and trade, illegalities can occur (see Figure 6 below).



24. Defining what illegal logging is can be surprisingly difficult (Miller, Taylor and White, 2006). Different definitions lead to very different conclusions on the magnitude of the problem. It is not a mere technical issue, but one which has far-reaching political implications. Illegal logging is often equated with unsustainable forest harvesting practices. This is because most forest laws naturally focus on management practices that are intended to ensure sustainable use of forest products and services; however, this is not always the case. Logging may be technically illegal, yet sustainable. It may also, of course, be legal, yet unsustainable. Nevertheless, we will focus here on illegality, whilst noting that there is no one-to-one relationship between illegality and sustainability.

25. Every scheme to combat illegal activities must deal with the conceptual problem of defining what is and is not illegal. The legal classification of illegal logging determines the use of the prosecution instruments that can be used to combat illegal logging. Also the penalties for illegal acts are commensurate to the nature and classification of the offence.

26. In its narrower connotation, illegal logging occurs when timber is harvested in unauthorised ways, in violation of established laws and regulations (Callister, 1999; FAO 2002). For example, wood may be harvested in excess of legal limits, in places where such harvest is prohibited such as in national parks and protected areas, in locales where forests provide essential environmental services, protected by law, such as upper watersheds and riparian zones. Wood may be simply stolen from the rightful owners.

27. The Royal Institute of International Affairs has adopted a broader definition of illegal logging:

“Illegal logging takes place when timber is harvested, transported, bought or sold in violation of national laws. The harvesting process itself may be illegal, including corrupt means to gain

access to forests, extraction without permission of from protected area, cutting of protected species or extraction of timber in excess of agreed limits. Illegalities may also occur during transport, including illegal processing and export, misdeclarations to customs, and avoidance of taxes and other charges.”

There are no clear rules for establishing the boundaries of the set of activities covered under this definition of illegal logging and trade. For example, should wood originating in forest lands acquired with illegal proceeds be considered illegal, when the enterprise has followed all rules and regulations related to land acquisition and forest management? The economic and social environment in which wood is produced, harvested, transported and sold is broad and a single activity in the forest sector could be related to many others in other sectors, some of which may be illegal. Obviously, at some point a boundary must be set but it is not clear, or universally accepted, where this boundary should be.

28. In this report, and interpreting the span of actions discussed in the international debate on the subject, we have adopted the categorisation “illegal logging and trade” to encompass illegal harvest, transportation, processing and trade of wood products. Thus, practically all unauthorised major activities in the forest sector are part of “illegal logging and trade” concept.

29. In many developing countries, forest resources are typically in the hands of the government. Governments authorise private firms to harvest wood in public forests under concessions that specify what species and volume of wood may be harvested, in what areas of the forests and when the trees can be cut. Such concessions often include norms that regulate the type of harvesting technologies that can be used to minimise damage to the forest and ensure its production. Access to forest resources may be illegal in several ways:

- concessions may be awarded in breach of rules that prohibit the location of extraction activities in places of environmental fragility (such as river banks or steep slopes) should not be logged;
- the process of harvesting wood itself can be illegal if it is done using technologies that ignore mandatory environmental safeguards to minimise damage to the soil and environment;
- harvesting can take place outside concession boundaries or in protected areas, such as national parks;
- extraction can be illegal because it extends to protected species.

30. Once harvested, illegal logs may be smuggled out of the country without proper payment of export duties or transported without transit authorisation to industrial processing mills. Processing mills may lack industrial operating licences. Even if licensed, industrial processors may mix illegal logs with legal ones. Unlawful activities at the point of sale, either in national or international markets, include falsification of certificates to avoid taxes, ‘laundering’ of illegal wood and abuse of transfer pricing (see Annex 1 for a list of illegal activities related to logging and trade).

3.3. How important is it?

31. By definition, illegality is hard to quantify. Given its clandestine nature and the methodological problems involved in computing consistent and comparable estimates, reported figures of illegal logging are imprecise. The magnitude of illegal wood entering markets is difficult to assess in countries that have imperfect monitoring and statistical systems. Wood coming from many different suppliers may be processed by thousands of industrial enterprises that use a mix of legal and illegal material making it

virtually impossible to separate the proportion of illegal wood. Products are sold in national or international markets where sources are further mixed as products travel from country to country. All this makes tracking of illegal wood a challenging endeavour. Nevertheless, even allowing for these difficulties and the inherent estimation errors, various reliable assessments show that the order of magnitude of global illegal logging is substantial. Country-specific case studies confirm that in many places illegal logging is extensive⁷ (See Table 2).

32. A comprehensive assessment estimates that illegal logging worldwide is probably as much as 5 to 10% of global industrial round wood production. Since most of the illegal logging takes place in developing countries, the proportion in these countries is much higher (Seneca Creek Associates and Wood Resources International, 2004). The World Bank concludes that the global loss of assets due to illegal logging in public lands exceeds US\$10 billion per year in developing countries and that an additional US\$5 billion is lost to tax evasion on legally logged wood (World Bank, 2006). Other studies have placed the global value of illegal wood at some US\$23 billion per year (World Bank, 2002; Seneca Creek Associates, 2004).

33. The amount of illegal wood that enters international trade is not known. Some analysts estimate international trade of illegally logged products and primary products at around US\$5 billion per year (around 6% of the value of total primary products trade) but the actual figure may be a great deal higher, as studies do not include products that are legalised or laundered.

3.4. *Who are the main actors?*

34. A wide variety of actors participate in illegal logging. They have various degrees of involvement, from being direct suppliers of stolen wood to industrial processors who turn a blind eye to the use of illegal product in their operations.

35. In developing countries those engaged in illegal logging can be roughly divided into two groups: those that cut trees for their own use and those that cut for commercial and industrial use. In the first case, illegal harvesting is driven primarily by poverty. Wood is taken for fuel for cooking and heating and as a construction material for housing and other rural buildings. In the second case, commercial enterprises engage in illegal logging for profit. The distinction between these two groups is important, because their motivations and procedures are radically different and therefore remedial actions to control illegal logging

Table 2. Estimates of Illegal Harvest		
Country	Illegal logging as percent of production	Source
Africa		
Benin	80	SGS, 2002
Cameroon	50	European Commission, 2004
Ghana	At least 66	Birikorang, G. 2001
Mozambique	50-70	Del Gatto, 2003
Asia		
Cambodia	90	Global Witness, 1999
Indonesia	Up to 66% 73-88	World Bank 2006a Schroeder-Wildberg and Carius, 2003
Malaysia	Up to 33	Dudley, Jeanrenaud and Sullivan, 1995
Myanmar	80	Brunner et al. 1998
Latin America		
Bolivia	80	Contreras-Hermosilla, 2001
Brazil	80 in the Amazon	Viana, 1998
Colombia	42	Contreras-Hermosilla, 2001
Ecuador	70	Thiel, 2004
Honduras	75-85 of hardwood 30-50 of softwood	Richards, et al, 2003
Nicaragua	40-45	Richards, et al, 2003
Costa Rica	25	MINAE, 2002
Europe and North Asia		
Albania	90	Blaser et al, 2005
Azerbaijan	Very large	Blaser et al, 2005
Bulgaria	45	WWF, 2005
Georgia	85	Blaser et al, 2005
Russia	20-40	Blaser et al, 2005

should also be different. On the other hand, there are many linkages between the two groups. Small independent operators may harvest wood illegally and sell it to traders that buy the wood at roadside with no questions asked. Transporters of logs may also be independent entrepreneurs between illegal loggers and traders and industrial wood processing enterprises. In some cases, large-scale commercial enterprises have organised and financed the rural poor to extract timber on their behalf. It is therefore not always the case that one enterprise obtains access to forests and carries out all the successive stages of transportation, processing, marketing and sale of products. In most cases various actors are engaged in different stages.

36. While many of the corporate actors are national firms, in many parts of Africa, Latin America and Asia international companies from both industrialised economies or from other developing countries (notably from Asia) also carry out illegal logging operations. Several other entities are involved in the international trade of forest products. Logs may travel to two or more countries before being sent either as logs, primary processed products such as sawn wood or finished products such as furniture, to other countries of final destination, thus linking various layers of industrial processing firms and international traders. For example, many of the logs sent from Papua New Guinea and Indonesia to China, sometimes through third countries, are processed in China and exported as finished forest products for consumption in Europe and North America. Because of this, consumers must also be regarded as key actors. Indeed, the various international schemes aimed at controlling illegal logging have recognised the utility of consumer participation in remedial programmes to control illegal logging.

37. In each of the stages of the production and trade chain there are opportunities for contact between illegal actors and officers of governments who are entrusted with awarding permits, approving mandatory forest management and harvesting plans, controlling transport and export of products and inspecting the operation of forest industries. This means that at each stage there are opportunities for corrupt government officers to collude with illegal operators in dodging the law.

3.5. *What are the consequences of illegal logging? Who loses and who benefits?*

38. Illegal logging produces winners and losers among the many actors described above. As is often the case the pronounced winners tend to be the concentrated, distinct parties who engage directly in the illegal activity, whereas the losers will be more numerous but much more dispersed. This makes the political economy of any proposed solution a challenge. Identifying the winners and losers of illegal logging is a key consideration in planning remedial actions, and involves facing up to vested interests who are powerfully motivated to fight measures designed to change the status quo.

39. Those that greatly benefit from illegal logging, at least in the short term, are those engaged in the different stages of the process from acquiring control of forest resources to traders. Illegal loggers benefit financially as do corrupt partners in government, so it is therefore realistic to expect them to resist change. Final consumers, a large group, are likely to see a less perceptible benefit from illegal logging, mainly in terms of reduced market prices. As the resource costs typically comprise but a small proportion of the price of the end product this effect will be relatively small.

40. On the other side of the ledger, governments are key losers. Illegal logging in developing countries causes losses in excess of US\$15 billion per year⁸. These losses represent assets and revenues that national governments, firms or individuals could have used for urgently needed investments in health, education, infrastructure and improving the management of forest resources or to satisfy basic consumption needs. To put matters in perspective, this figure is as much as eight times the volume of official development assistance directed to the forest sectors of developing countries. In Indonesia, for example, the government is thought to lose a minimum of US\$600 million a year in revenue foregone as a result of illegal logging⁹. This is a significant sum when set against total government expenditure of around US\$40 billion, and total development assistance received in all sectors of around US\$2.5 billion¹⁰.

41. Legitimate investors may see their operations fail. Illegal wood is not burdened by taxes, stumpage fees and expenses for compliance with forest and environmental regulations. It is therefore cheaper to produce than legal wood. Illegal logging and the consequent increase in the supply of low cost wood depresses market prices, reducing the incentive to invest in sustainable forest management for investors who respect the law. A study of the total effect of illegal forest products entering global markets shows that, depending on the type of forest product, international price reductions may be of the order of 7 to 16% (Seneca Creek Associates, 2004). This is a reduction that illegal operators can well accept and still make money, but it may be enough to make legitimate enterprise leave the market.

42. Sometimes it is argued that the poor benefit from illegal logging by gaining employment in harvesting and transport operations. However, these gains have almost always proven to be minimal and transitory. For example, studies in Indonesia show that local workers get less than 10% of the value of the harvested timber. Further, large commercial loggers are typically able to take over the control of valuable forest resources, displacing the rural destitute. And in all situations where extractions exceed the capacity of forest to regenerate and to produce sustainable harvests, illegal logging tends to be of a “boom and bust” nature – there is intense activity for a few years and then the logged-over area is abandoned. This disproportionately impacts on the rural poor, who often lack the capacity to switch swiftly to other sources of supply of essential forest products or to find alternative sources of income. Nevertheless, the effect of sudden law enforcement without subsequent action to address poverty must be taken into account so that poor forest dwellers as well as those that depend on logging for employment and income are not left worse off in the short term. For law enforcement to be sustainable, credible alternatives to deforestation and illegal logging must be on offer.

43. All citizens lose as a result of the destruction of key environmental forest values. Farmers and fishermen may see their costs increase as land and water resources are degraded by erosion, sedimentation and variations in hydrological regimes caused by deforestation. Consumers of agricultural products may experience increases in food costs. In some countries illegal logging has been associated with the occurrence of forest fires. As an example, in Indonesia forest fires induced by illegal logging and illegal conversion of forest lands to other uses destroyed 10 million hectares of forest and scrubland in 1997/1998 exposing at least 20 million people to smoke borne pollutants for months on end (Barber and Schweithelm, 2000).

44. Illegal logging undercuts investment in sustainable forest management. When the rule of law is weak, uncertainty tends to be high. Investments in sustainable forest management take many years to mature and therefore they are likely to be negatively affected by high levels of uncertainty. Instead, quick “cut and run” operations that generate immediate profits for a few are more likely to take place. Future generations are the ultimate losers as they inherit a degraded natural environment.

45. Illegal logging undermines political stability and has often exacerbated armed strife. In some cases, illegal forest activities have been the source of financial resources to sustain conflict. For example, “conflict timber” has at various times contributed to financing weapons purchases by warring factions in the Democratic Republic of Congo, Cambodia, Myanmar and Liberia.

46. In short, illegal logging can carry significant deleterious environmental, economic, equity and sometimes political impacts affecting many while enriching a few.

4. Incentives for illegal logging

47. Illegal logging takes place because it is significantly more profitable than legal logging and the risks of apprehension are low. A number of factors contribute to this state of affairs: weak government

institutions, poorly designed policies and half-hearted or non-existent law enforcement and monitoring either as a result of a lack of resources or, in some cases, outright corruption.

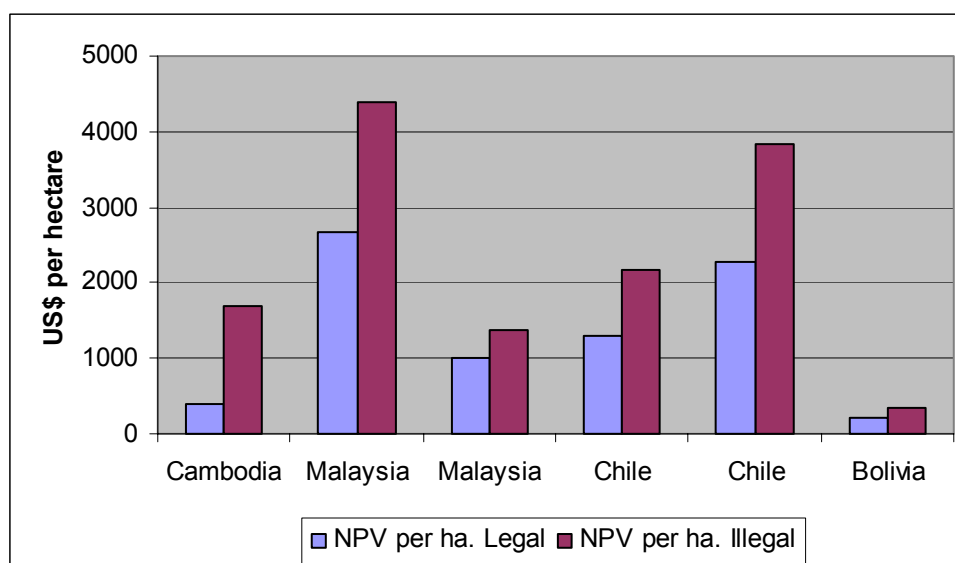
4.1 *The lure of financial profits*

48. Illegal operators ignore the law because the financial rewards of doing so are higher than those available from legal operations. The larger the margin between legal and illegal operations, the more powerful this incentive will be. Since the price of illegal wood in most markets is indistinguishable from the legal variety, loggers will engage in illegal logging if the costs of compliance with the law are higher than the costs of avoiding it, including the costs of being caught.

Table 3. Differentials Between Legal and Illegal Logging

Item of cost	Costs of Law Compliance	Costs of Illegality
Preparation of Sustainable Forest Management (SFM) Plans - Forest Inventories - Preparation of SFM Plan	Yes	Negligible
Bureaucratic procedures to obtain approval of SFM plans and associated permits	Yes	Negligible
Payment of royalties and fees	Yes	Negligible
Restrictions on species that can be harvested	Yes	Negligible
Restrictions on volumes that can be harvested	Yes	Negligible
Restrictions to limit or avoid harvesting in environmentally sensitive areas	Yes	Negligible
Limitations to technologies that can be employed in harvesting (RIL)	Yes	Negligible
Costs monitoring, documenting and reporting harvesting operations to government	Yes	Negligible
Cost of certification	Yes	Negligible
Cost of transportation permits	Yes	Negligible
Cost of bribes to obtain false transportation permits	Negligible	Yes
Export licenses	Negligible	Negligible
Cost of bribes to obtain false export licenses	Negligible	Yes
Smuggling costs	Negligible	Yes
Export taxes (if wood is not smuggled)	Yes	Yes
Costs of bribes to avoid: - Reporting detection of illegal logging - Prosecution - Conviction	No	Yes
Costs of fines and other penalties if detected, prosecuted and convicted: - Loss of harvesting permits - Financial fines - Blacklisting of firm - Jail	No	Yes
Taxes on corporate income	Yes	Negligible
Money laundering costs	Negligible	Yes
Price of wood in non-discriminating markets	Identical	Identical

49. The expected differences in costs at each one of the stages of illegal logging process are displayed in Table 3. Figure 7 displays some cases where the differentials between complying with the law (in these cases SFM regulations) and avoiding it have been estimated. They show that in fact illegal logging is substantially more profitable than the legal kind and that there is therefore a clear financial incentive to engage in illegal activities.

Figure 8. The cost of law compliance: SFM regulations

Source: Bolivia: Bojanic and Bulte (2002); Chile: World Bank (1994); Cambodia and Malaysia: Boscolo and Vincent (1998); Malaysia: Kumari (1995).

50. Remedial actions must work towards inverting the relationship between the costs of legal and illegal operations. The costs of illegal logging can be increased by strengthening monitoring, improving the capacity of government institutions to effectively prosecute offenders and increasing the penalties of flouting the law. On the other hand, governments can also strive to reduce the costs of legal compliance, making legal logging more attractive. An implication of this is that measures to improve law compliance will need to assess carefully whether they introduce additional costs to operators. Additional regulation often increases the gap between the costs of legal and illegal logging, creating new incentives to avoid the law and thereby having the opposite effect to that originally intended.

4.2 *Imbalances between industrial supply and demand.*

51. In some countries such as Cambodia and Indonesia excessive expansion of industrial capacity well beyond the possibility of forest resources to supply the industry's needs of wood raw material creates inducements to obtain wood illegally. In the case of industrial forest production lines that require large inputs of wood and have high capital and operating costs (such as in the paper industry) it is very costly to operate at less than full capacity. The enticement to procuring supplies from illegal sources then becomes very strong.

4.3 *Information and knowledge limitations*

52. Forest resources tend to be located in remote places. They can be extensive, covering large areas with vegetation of different types in complex ecosystems. Developing countries seldom have a good inventory of forest resources or know much about their extension and quality. The location and even the identity of some commercially valuable species are often imperfectly known, as is the scale of the available resource. Thus, it is usually difficult for forest agencies to have a baseline against which changes in the resource base can be monitored and illegal activities detected. Even with modern detection and monitoring technologies, illegal logging and other operations may take place for extended periods before government agencies become aware of them. The lack of a solid baseline also makes it difficult to prosecute offenders

as it is almost impossible to demonstrate the nature and the magnitude of the forest alterations they have caused as well as the value of the damage resulting from illegal operations.

53. Tracking the progress of wood as it is processed in various industrial products and traded in various markets is a logistical challenge. Illegally logged wood may be exported to non-discriminating third country markets from where it can be “laundered” and re-exported under the appearance of legality. Illegal wood can also be mixed with legal wood and used as raw industrial material in the production of other more elaborate products such as paper and furniture, thus making it difficult to recognise and measure its hidden illegal components. Governments in developing countries rarely have the capacity to monitor these actions and therefore to identify departures from the law.

4.4 Failures of the law

54. If financial profits draw operators to illegal logging, inadequacies in the legal framework often push them in the same direction by increasing the cost of compliance. Forest-related laws in developing countries are often cumbersome to follow, inconsistent and sometimes contradictory. This makes it very difficult even for those who want to comply. In Indonesia, for example, and until recently, every year and for every timber concession, a company was required to submit some 1,600 documents as well as large volumes of data to 16 agencies in Jakarta and eight in the regions (Casson et al, 2004). Many concessionaires found it impossible to comply with these requirements. In other cases, laws are passed, but not their implementing regulations. Again, in Indonesia, Sembiring (2002) reports that the new forestry law required a minimum of 21 regulations to guide private parties but that none had been issued three years after the approval of the law. By neglecting to issue the required operational regulations governments give a strong signal that compliance with the law is not important. This is hardly an incentive to legal operations (Christy, 2004).

55. It is not uncommon to see new forest laws that are unclear or that contradict rules in other related areas of activity such as land use or conservation (Sarin, 2003). The 2004 Independent Forest Sector Review of Cambodia, for example, stated “It is not too extreme to say that the forest sector can be best characterised as a sector in disarray where formal rules of the game are unclear, contradictory and incomplete, allowing informal and hidden rules to operate”.

56. Failures of the law also effect economic incentives directly as compliance with regulations may be so onerous that it eliminates any profitable investment in sustainable forest management. A study of the introduction of a new forest law in Bolivia shows that compliance would reduce profitability of forest concessionaires by 40%, making any investment in forest management in compliance with the law unattractive in comparison with available investment options in the economy (Bojanic and Bulte, 2002).

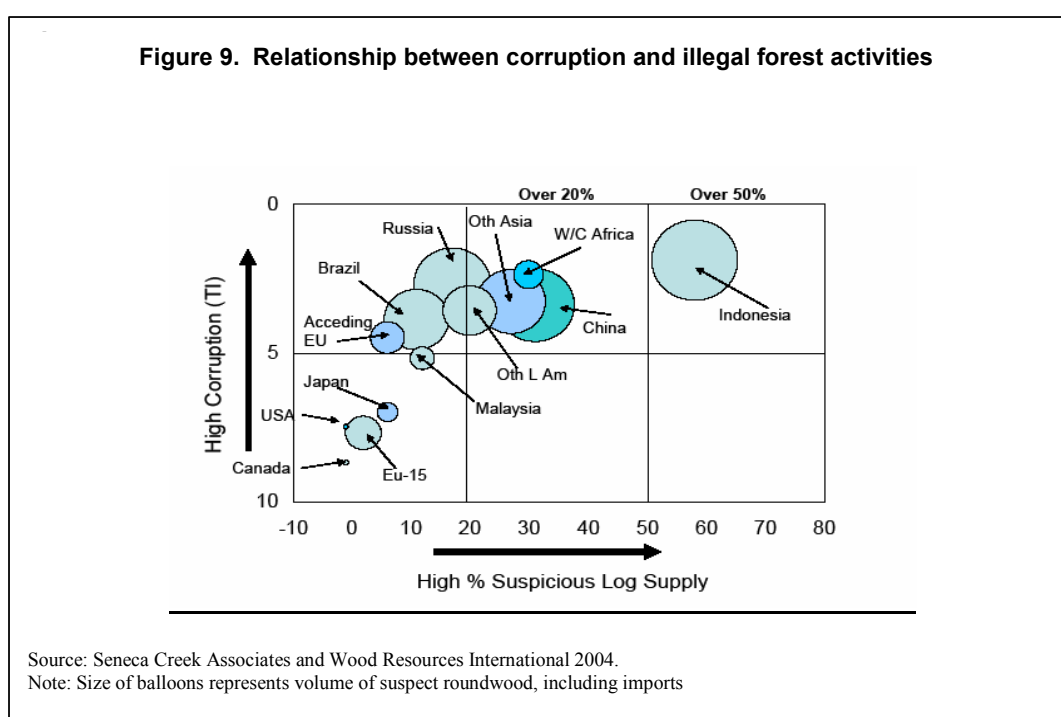
4.5 Limitations of government agencies

57. A very serious limitation on the ability of governments to detect and prosecute offenders and enforce the law is the lack of adequate resources. In many developing countries, it remains the case that a small number of officers, often low-paid and poorly-trained, are expected to monitor immense areas with insufficient resources. For example, the Nicaraguan Forest Service office in Puerto Cabezas municipality has a total staff of only one officer, two assistants and a secretary. Transportation depends on a single motorcycle. This team has the responsibility for enforcing the law in a territory of 1.5 million hectares. This includes, among other things, monitoring how the forest is being used, comparing this with permits issued, gathering evidence in cases where discrepancies are found, impounding equipment used in illegal operations, apprehending criminals and initiating legal procedures against them. Evidently, such a small and poorly-equipped team has no capacity to even monitor what is happening in this vast area, let alone

enforce the law. This weak team faces well-armed forest operators who have few scruples in using force to impose their way (Ampié Bustos, 2002).

4.6 Corruption

58. Illegal logging can be, and often is, associated with corruption, with criminals colluding with willing government officials to avoid the law¹¹ (Figure 8). Bribes and kickbacks are paid to government officials for favourable decisions. In other cases, bribes are paid to “facilitate” government logging authorisations. Money is extorted to authorise transportation permits, to issue harvesting licenses or to authorise forest land use conversion (Casson et al, 2004). By illegally releasing harvesting permits corrupt officers “legalise” products flowing through the supply chain. And when corruption and other illegal activities are tolerated or even encouraged by government officials that extract money from unauthorised loggers, a vicious circle of illegal acts is created.



4.7 Inadequate safeguards relating to developments in other sectors

59. Transportation infrastructure, mining and oil extraction operations create strong incentives for illegal logging by opening up new forest areas previously protected by their inaccessibility to loggers. The construction of roads near or through forest, for in itself good reasons, lead at the same time to increased opportunities for illegal logging. Roads are built to gain access to mineral and oil resources that are under or near forests. The economic incentives these roads give to illegal logging operations, by lowering transportation costs and increasing the economic value of land, could in many cases have been prevented by better planning procedures that take these incentives for illegal activity into account. Road building is the single most powerful element in the illegal deforestation of frontier areas in Latin America. In Brazil studies show that between 400 and 2000 hectares are illegally deforested by each kilometre or new road built into forests (Contreras-Hermosilla, 2000).

PART II: STRATEGIES TO COMBAT ILLEGAL LOGGING

5. Strengthening law enforcement and governance in producer countries

60. Measures to combat illegal logging can be broadly divided in two complementary categories:

- measures that increase the risk of punishment of illegal behaviour in producer countries and increase the benefits to a sustainable management of the forest (supply side measures);
- measures that reduce rewards for illegal logging by discriminating between legal and illegally sourced wood products and closing markets in consumer countries (demand side measures).

61. To date, there are complementary international schemes to combat illegal logging. The first type of scheme gives preferential attention to policy initiatives aimed at reforming conditions in producer countries (supply side). The second one focuses mainly on the forces of international trade but also includes remedial initiatives closely linked to products that enter international markets which need to be implemented by both consumer and producer countries. In addition, there are several initiatives directly involving private sector corporations that involve measures in both producer and consumer countries.

5.1. *Forest Law Enforcement and Governance (FLEG)*

62. Illegal logging takes place on national territory. Nevertheless, because global forest resources constitute a global public good the international community has taken a great deal of interest in combating illegal logging (see Annex 1 for an overview of the different international initiatives). After the launch of the G8 Action Plan on Forests in 1998, the World Bank, the Governments of the United Kingdom and the United States and other partners organised the Forest Law Enforcement and Governance (FLEG) process to foster broad political commitments for improving law enforcement. Today the FLEG initiative comprises a broad coalition including civil society and the private sector.

63. The FLEG process recognises that the problem of illegal logging and trade is a governance problem. Producer and consumer countries must have the political commitment and institutional capacity to improve sector governance. The FLEG process aims to improve forest law enforcement and governance in three sequential steps: 1) establish the analytical foundations needed to combat illegal logging and trade; 2) raise political awareness and commitment to control illegal logging and trade; and 3) create partnerships to initiate action with the intention of mainstreaming FLEG processes both into country reforms and regional political organisations. To date the FLEG process has launched three regional initiatives in East Asia-Pacific (2001), Africa (2003) and the Europe and North Asia Regions (2005).

64. These regional processes have created regional analytical bases for organising remedial actions. They have increased political awareness among importing and exporting countries as well as commitment to organise actions as expressed in regional Ministerial Declarations. These declarations include Plans of Action to be implemented by signatory countries, international organisations and partners in the private sector. The regional initiatives are also progressing towards mainstreaming FLEG processes into existing regional institutions such as ASEAN.

65. Concrete measures to combat illegal logging can be classified under three headings: prevention, detection and suppression (World Bank, 2006). They are closely interrelated and need to be implemented in a way that makes them mutually reinforcing.

5.1.1 *Measures aimed at prevention*

66. A variety of measures can be used by governments to reduce the incentives to engage in illegal logging depending on the context. As the scale and nature of illegal operations differs, the incentives to correct and prevent these activities will differ as well. For example, measures aimed at preventing small scale logging by poor operators should focus preferentially on energy access and poverty alleviation. Unauthorised industrial logging employing capital-intensive harvesting techniques may be more effectively prevented by scaling back possible overcapacity in the processing industry or by adjusting the tax and royalty system to increase the profitability of legal operations.

Improving land tenure and land ownership rights

67. Uncertainty of land tenure generates incentives for illegal logging and accelerates harvesting of wood. While situations may vary from country to country, there is now ample evidence that establishing a solid system of property rights improves the quality of forest management and the propensity of forest landowners to comply with the law (Molnar, Scherr and Khare 2004).

Streamlining the legal framework

68. Having better forest laws and regulations and fewer of them is a useful rule of thumb. Reducing the complexity of laws and regulations reduces the cost of compliance and therefore the incentive to produce legally will increase. Improving access to information by the general public can be an important tool to promote transparency and accountability. In the forestry sector this is especially so with regard to information relating to bidding procedures for forest concessions, the rules that apply to concession areas and associated financial transactions.

Achieving a reasonable balance between demand and supply of industrial forest raw materials

69. In some countries, a key driver behind illegal logging derives from a large imbalance between industrial demand for wood and the capacity of legal supply to satisfy that demand. Governments can exert greater care in authorising forest industrial expansions, making sure that sources of forest raw materials are available or will be created through, for example, expansion of forest plantations.

Attacking the financing of illegal operations

70. Prevention may also focus on eliminating the means of financing illegal logging. Actions can be taken to make it more difficult to launder the profits from illegal logging. More than 100 countries now have anti-laundering laws and more are joining every year. Technologies for identifying and tracking suspicious movements of money have improved as has the money laundering intelligence capability of many countries. Countries wishing to fight illegal logging effectively by using this type of legislation need to list illegal logging as one of the predicates for money laundering.

Improving the profitability of legal forest management and logging by promoting payments for environmental services (PES)

71. Various schemes are being tried to create markets for the global and local public goods that forests create. Forest landowners do not get paid for providing watershed protection services, protecting forest biodiversity wealth or sequestering carbon. These services lack established markets. If markets for these services could be created so that forest landowners could obtain financial compensation from those that benefit, the profitability of legal forest management could be increased. Of these, the one that appears to have the greatest potential is carbon sequestration. The UN Framework Convention on Climate Change (UNFCCC) has recently been discussing proposals to reduce emissions from deforestation by establishing a

financial mechanism to provide positive financial incentives for developing countries that voluntarily reduce their emissions from deforestation.

72. Calculations done for the Stern Review (2006) show that the mitigation costs of deforestation are relatively low as the opportunity costs of the net income foregone from the sale of timber, agricultural production and the costs of administering and enforcing forest protection is usually well below US\$5 per tonne or somewhat higher if value added activities related to further processing and the income from export tariffs are included. This compares well with other mitigation opportunities.

73. The report concludes that reducing deforestation offers a major opportunity to reduce emissions at relatively low cost. Assuming a long run carbon price of US\$35-50, a hectare containing 500t CO₂ would be worth US\$17,500–25,000 in terms of the carbon contained if it were kept as forest. At these prices considerable funds could become available for alternative development possibilities, strengthening law enforcement and investments in sustainable forest management.

5.1.2 Measures aimed at detection

74. Forest crime cannot be controlled if it cannot be adequately detected, monitored and documented. Remarkably, the World Bank reports that few countries have forest monitoring programmes and even fewer are geared towards detecting illegal logging (World Bank, 2006). The basic information to guide priority setting is often unavailable.

75. Advanced and relatively inexpensive technologies exist for measuring forest characteristics and their evolution over time, such as changes in land use, the construction of unauthorised forest penetration roads and development of illegal mining. Observations of expansions of authorised logging roads in forest concessions can be easily correlated with declared volumes extracted. Large discrepancies suggest illegal logging. Forest monitoring and surveillance technologies are being improved rapidly and effective detection of unauthorised change in the features of forest resources is becoming a real possibility even for relatively poor forest administrations.

76. Monitoring the movement of forest products can also help detecting illegal logging operations. For example, mismatches between declared exports from a producer country and corresponding imports declared by the importing country suggest false reporting, smuggling or corruption.

5.1.3 Measures aimed at suppression

77. Monitoring illegal logging is useless unless governments have the institutional capability to enforce the law. Without the real threat of sanctions, illegal logging will remain more profitable than operating legally and remain attractive to unscrupulous operators. Suppression depends on staff who are properly trained in criminal investigation procedures. They need to be intimately acquainted with judicial processes and able to collect evidence that will stand up in court so that the risks of successful prosecution are significantly increased. At the same time courts should be giving deterrent-sized penalties, instead of low-level fines which can be absorbed into the costs of doing business.

78. Suppression of illegal logging almost always involves the use of force and the imposition of physical and financial penalties. This often makes suppression operations dangerous. Officers of the forest administration and perpetrators are routinely exposed to physical harm. For this reason government forest officers must resort frequently to other law enforcement agencies of government such as the police, customs and, in some cases, the military. Without the support and protection of these agencies, enforcement officers can be exposed to serious risks. In turn, recourse to these coercive agencies must be transparent and subject to proper accountability.

5.2 *OECD Anti-Bribery Convention*

79. Prevention, detection and suppression are not only responsibilities of producer countries. This has been acknowledged by the OECD Convention on Combating Bribery of Public Officials in International Business Transactions which entered into force in 1997¹². Bribes to foreign public officials, including those who work in the forestry area, are now a crime under the national law of every OECD country (and six others that have joined the 36-member Working Group on Bribery). As a result, if any individual or company from an OECD country who is doing business in forest rich producer countries bribes a public official in order to obtain forestry-related benefits, it is a crime in the OECD country (as well as in the local jurisdiction)¹³.

80. In addition to the criminalisation of bribery, work under the Convention focuses on other key areas of government action: improving awareness that foreign bribery is an offence; strengthening laws and policies on reporting of suspicions of foreign bribery to law enforcement authorities; adopting or reinforcing sanctions for foreign bribery to include exclusions from public benefits such as export credit support or eligibility for public procurement processes; and assisting key constituencies (companies, lawyers, accountants/auditors, banks, etc.) to improve their preventive efforts. Under the Convention, OECD governments are supposed to encourage or require companies to take action on fighting foreign bribery. Available measures extend to applying accounting and auditing standards and internal controls, and raising awareness about the extra-territoriality of bribery offences¹⁴.

6. **Options for controlling the international trade in wood products**

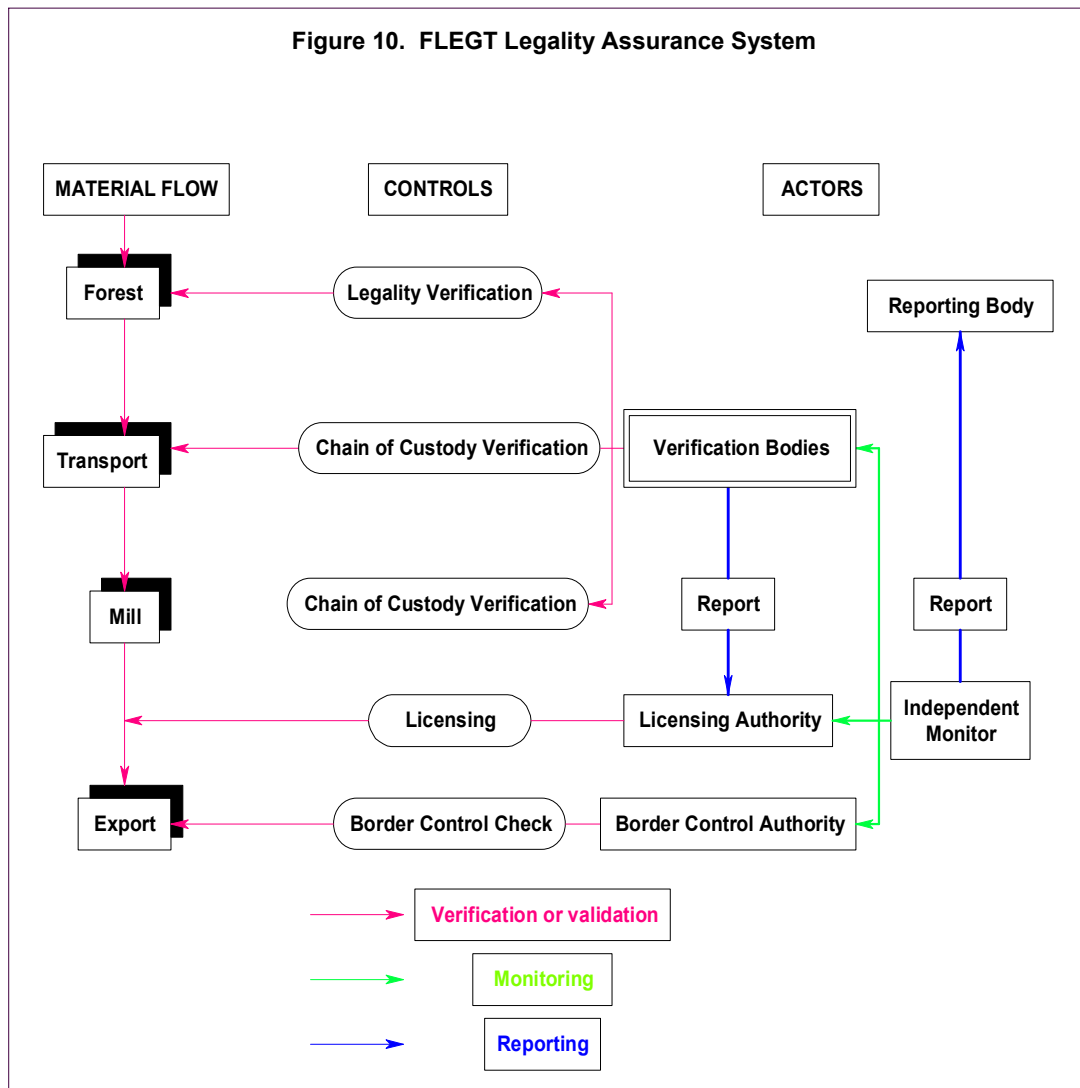
81. The other group of measures to combat illegal logging involves discriminating between legal and illegally sourced wood products through trade-related measures (demand side). This can be done either by international agreements or by national measures. In all cases, a reliable chain of custody control is necessary (this is discussed in section 6.3).

6.1 *International agreements to control trade in wood products*

82. The EU's Action Plan on Forest Law Enforcement, Governance and Trade (FLEGT), published originally in 2003, is at the heart of international efforts to control trade in wood products¹⁵. The FLEGT Action Plan focuses initially on the establishment of bilateral and, over the longer term, regional schemes that identify legal products and licence them for import to the EU. Unlicensed products will be denied entry at the EU border. A multilateral licensing scheme for legal timber is mentioned as the end goal.

83. Under the FLEGT Action Plan, producer countries negotiate Voluntary Partnership Agreements (VPAs) that lay down the details of the licensing scheme and set out the provision of capacity-building assistance that will be offered by the EU. The implementation of each VPA requires:

- a definition of legally produced timber;
- a secure chain of custody to track timber from the forest to the various stages of transport, processing and export;
- a verification scheme that would provide assurance that the wood is legal;
- the issuance of a licence to validate the results of the legality verification; and
- an independent monitor to ensure credibility, transparency and trust.



84. Whilst the EU FLEGT Action Plan is broadly seen as a positive step in engaging with producer countries in combating illegal logging, commentators have pointed to a number of structural defects in the scheme¹⁶.

- The licensing scheme will, initially at least, only cover a limited range of products – wood in the round, sawnwood, plywood and veneer – with the intention of extending it to other product categories. Without extension to other wood products the system is not likely to make a very significant impact as the import of these primary wood products is limited. For the EU licensing scheme to have any real impact, secondary-processed wood products will have to be included.
- It is possible that the scheme will only lead to a segmentation of the market without having an impact on illegal logging. The EU market will be serviced by legal production whilst illegal product will be diverted to non-EU countries.

- Evading a bilateral scheme is not very complicated as not all countries will close bilateral agreements with the EU and therefore unlicensed product from VPA countries will be able to enter the EU market via non-VPA countries.
- At the moment VPA countries are under no obligation to control their own imports; this provides another route for evasion. To be effective the FLEGT licensing system will have to include movements of products through third countries before final export to the EU.
- A regional agreement such as that proposed by the European Commission between the EU and the ASEAN countries could help to overcome some of the trade evasion effects but still relies on very sophisticated chain-of-custody procedures. Illegal products can still enter the EU market via trading through third countries that are not part of the regional agreement although this is likely to increase the costs of illegal products and thus reduce the spread between legal and illegal products.

85. The conclusion must be that bilateral and, to a lesser extent, regional schemes can only be a first step and must be followed by schemes with a more extensive geographical coverage. Such schemes must also include chain-of-custody control from the point of harvesting to final sale of wood products to end consumers. The ultimate conclusion is that FLEGT will probably have little impact unless it is followed by a multilateral agreement. Multilateral agreements are more effective in controlling international trade primarily because they are not so easily evaded. There are several examples of licence-controlled multilateral trade systems: for example the Convention on International Trade in Endangered Species (CITES), the Montreal Protocol on ozone-depleting substances and the Kimberley Process on conflict diamonds are examples.

86. Any restrictions on trade, including labelling requirements, tariffs and taxes, trade embargoes or any form of discrimination, are potentially subject to the disciplines of the trade agreements administered by the World Trade Organization (WTO). Because the EU FLEGT process is built on voluntary agreements, it does not raise any WTO complications. The same would hold for a multilateral agreement – assuming sufficient countries signed up to it.

6.2 National measures to control imports

87. Consumers, whether individual consumers, companies or governments, can take voluntary action to limit the use of illegal wood by demanding proof of legality when purchasing goods. Governments have taken action in some countries to exclude illegal products from their own purchases, creating protected markets for products which are demonstrably legal.

88. As governments in most developed countries are major consumers of wood products – in the form of buildings, paper and furniture – they can significantly influence markets by providing companies with an incentive to invest in certification schemes so as not to lose the government as a customer. Further more, once investments in certification schemes have been made, companies have an incentive to raise consumer awareness about the environmental consequences of their buying behaviour in order to maximise the returns from having invested in a controlled chain of custody. So although government purchases will in most countries not account for much more than 20% of total demand, they can have positive effects on it. Corporations and industry associations have also taken action to limit the use of illegally logged wood in their industrial processes. This may help to enhance their image with consumers. But as long as the price differential between certified and non-certified product is negligible – as is still the case in nearly all countries – the economic incentive for eco-labelling is not strong.

89. Another alternative for importing countries is to use domestic criminal law to combat illegal logging by prohibiting the import of foreign illegal products. One such example (although it applies to wildlife, rather than timber) is the Lacey Act in the United States, which makes it unlawful "...to import, export, transport, sell, receive, acquire, or purchase ... any fish or wildlife taken, possessed, transported, or sold in violation of any law or regulation of any State or in violation of any foreign law." There is, however, no U.S. or EU legislation at present prohibiting the import and marketing of wood products produced in breach of the laws of the country of origin.

90. The Lacey Act is regarded as a powerful piece of legislation but it has to be emphasised that it also raises significant evidentiary problems. Proving the underlying illegality is not always straightforward and generally relies on cooperation from the State of origin of the illegal product. The advantage of legislation of this type is that it can be triggered by a wide range of activities. For example, its scope need not be limited to theft but can also cover non-payment of charges or taxes. Neither does such legislation require proof beyond reasonable doubt that the importer knew of any illegality at the time the product was bought. In this way, a requirement for due diligence can be imposed on importers. As a measure that is purely domestic, legislation of this type can avoid the often protracted negotiations that surround multi-lateral mechanisms.

91. A final alternative, and a more straightforward option, would be to ban the import of timber and wood products not positively identified as legal. If the normal shipping documentation accompanying wood products cannot guarantee legality, additional proof would be required to gain entry. A multilateral agreement is in this case not necessary. But the same chain-of-custody control would be needed to prevent evasion of the scheme and laundering of the timber before it enters the market.

92. A ban on import by individual countries would, however, raises more questions as it would need to be made clear that any restrictions was not discriminatory and the same proof of legality would need to apply to domestic production. And even if proof of legality was required for domestic products, the measure might be found against by a WTO dispute panel on the grounds of having a disproportionate impact on trade.

6.3 *Chain-of-custody as a prerequisite to controlling international trade*

93. Measures to control trade flows depend on tight customs systems that can effectively detect and enforce rules against illegally-sourced products. They also depend on credible and effective tracking systems and the necessary institutional infrastructure in exporting countries.

6.3.1 *Certification*

94. Forest products certification is a procedure by which an independent third party inspects and provides written assurance that a product originates in a forest that complies with pre-defined social and environmental standards. While forest certification schemes are primarily designed to ascertain the future sustainability of forest management systems, all major certification schemes currently in existence contain elements that demand that operations must be compliant with the law. Certification can therefore ensure that wood is both legally sourced and that it originates in sustainable managed forests.

95. Certification is a "soft" procedure that is designed and implemented outside of government. It operates through the market, informing consumers that the wood they acquire comes from sustainable (and legal) sources of supply. The objective is to limit the market for products that are not certified, thus contributing to reducing the relative financial advantage of illegal wood. Certification tends, therefore, to equate legality with sustainability. Consumers can therefore influence demand by discriminating between legal wood and wood that is not certified. Further, in certain cases governments have accepted certification

as proof of sustainable management of the forest operation and have freed these certified operations from further inspections and bureaucratic procedures, thus reducing a burden on legal activities.

96. The United States, Europe and Japan together consume some 60% of manufactured forest products. In these countries, consumers are becoming increasingly aware of their consumption patterns on global natural resources and are starting to discriminate between certified and non-certified products in their purchasing decisions. Since 2002 the area of forest under certification has expanded from 30 to 180 million hectares worldwide (4.5% of total forest area). Although outstanding progress has taken place in various developing countries including Bolivia, Brazil, Honduras and Indonesia, a large share of the certified area is in OECD economies, where illegal logging is less of a problem.

97. Chain of custody certification requires accurate and reliable procedures for tracking wood as it moves from the forest through different stages of transformation and sale. The effectiveness of chain-of-custody tracking systems in some countries is questionable. Further, certification adds net costs to the operations of legal producers. The magnitude of added costs is highly variable, from fairly insignificant to considerable, according to the scale of operation, the certification scheme employed, the type of forest, and the magnitude of changes that management systems must adopt to achieve certifiable compliance (Simula, 2004). In most cases in the tropics involving solid wood products such as sawn wood, the additional costs brought about by certification have been found to be significant (Seneca Creek Associates and Wood Resources International, 2004).

6.3.2 *The Global Forest trade Network (GFTN)*

98. The GFTN is a WWF initiative that supports responsible private corporations, grouped in national and regional trade networks, with the aim of eliminating illegal logging and improving the management of forest resources. This is done by trying to create favourable market conditions through discriminating purchasing policies and certification, supporting the exchange of information and providing technical assistance. Currently the participants have forest products sales that exceed US\$48 billion per year, manage almost 20 million hectares of forests committed to certification, buy or sell some 295 million m³ of forest products every year and employ some 1.5 million workers. Thus, the volume of activity and impact of the Network is bound to be considerable and growing.

6.3.3 *Other Industry Initiatives*

99. Private corporations are the most potent players in the forest sector. The way in which forest corporations carry out their logging and trade in forest products can have a substantive impact on the control of illegal activities. Some progressive corporations and industry associations (covering hundreds of members) are voluntarily adopting standards of corporate behaviour or 'codes of conduct' that self regulate their approach in order to increase their proportion of legally sourced products. Examples include the International Council of Forest and Paper Association (ICFPA), the Confederation of European Paper Industries, the Interafrican Forest Industries Association (IFIA), as well as the Japanese Federation of Wood Industry Associations. These companies and industrial groups together comprise the vast majority of the world's large forest corporations. Developing and following codes of conduct which promote law compliance may increase efficiency and therefore strengthen a firm's comparative advantage in the long term, as well as promote a better corporate image. Other guidelines, such as Transparency International's adaptation of its anti-corruption tools for the forest sector, offer examples of the way forward.

100. In concrete actions to implement some of these policies, the UK, Netherlands, Spanish, German trade associations are likely to conduct audits of major Chinese suppliers & demand verification of legal sourcing of raw material. Individual firms have been developing their own codes of conduct and/or tracking systems which often advance beyond the association code, such as Finnish companies operating in Russia or IKEA in China. Several international initiatives such as Tropical Forest Trust (TFT) and the Global Forest Trade Network (GFTN) described above are providing advice and technical assistance to producers, suppliers and retailers, thus helping them clean up their supply chain with the installation of wood tracking systems, and allowing their customers gain confidence in the supply chain. An increasing number of retailers in Europe and North America in particular have instituted strict purchasing policies and preferences for certified wood products, such as B&Q UK and Home Depot. In the world of international finance, some major international banks (such as Citigroup, HSBC, ABN AMRO, ANZ and Bank of America) have or are developing specific forest policies requiring clients to ensure legal operations, committing themselves to due diligence processes which go beyond those required under the Equator Principles.

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ANNEX 1

ILLEGAL FOREST PRACTICES

- Violations of indigenous people's rights
 - Illegal appropriation of indigenous land
- Violations of public trust
 - Forestlands allocated unlawfully to other uses
 - Issuing and implementing regulations conflicting with other/higher regulations to legalise illegal timber products and activities
 - Issuing logging concessions, permits and authorisations in exchange for bribes and other private economic and political benefits
 - Using bribes, threats and violence to avoid prosecution/penalties or to obtain complacency
 - Using funds from illegal forest activities for political purposes
- Violations of public or private ownership rights
 - Illegal expropriation of private or community forests
 - Illegal occupation of public forestlands, including slash and burn agriculture
 - Illegal harvest on public lands (outside concession areas)
 - Illegal harvest on indigenous lands
- Violations of forest management regulations and other contractual agreements in either public or private forestlands
 - Logging without authorisations and/or required plans
 - Logging in excess of permitted cut
 - Logging unauthorised volumes, sizes, species (including protected ones)
 - Logging in prohibited areas such as steep slopes, riverbanks and water catchments
 - Girdling or ring-barking to kill trees so that they can be legally logged
 - Logging in protected areas
 - Arson to force conversion to other land use
- Violations of transport and trade regulations
 - Transporting logs without authorisation
 - Illegal transport of illegally harvested timber
 - Smuggling timber
 - Exporting and importing tree species banned under international law, such as CITES
 - Exporting and importing timber in contravention of national bans
- Violations of timber processing regulations
 - Operating without a processing license
 - Expanding capacity without authorisation
 - Using illegally obtained wood in industrial processing
 - Operating in violation of environmental, social and labour laws
- Violations of financial, accounting and tax regulations
 - Untrue declarations of volumes, species, values
 - Declaring inflated prices for goods and services purchased from related companies, including abuse of transfer pricing
 - Evasion and avoidance of taxes
 - Money-laundering through forest activities, or from illegal forest activities

Source: Tacconi, Boscolo and Brack (2003)

ANNEX 2

OTHER INTERNATIONAL INITIATIVES NOT DISCUSSED IN THE MAIN TEXT

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES is a legally-binding instrument of global reach. It has been ratified by 169 countries. CITES provides different levels of protection to species listed in its three appendices. Appendix I includes a list of species threatened with extinction. Trade involving these species can only be allowed under exceptional circumstances. Appendix II contains species that, although not threatened with extinction, need to be protected by controlling trade that may eventually lead to its extinction. Appendix III includes species that are protected in at least one country that has asked another CITES signatory to cooperate in controlling trade.

At present CITES is the only worldwide mechanism that can be used to control international trade of illegally-sourced wood. The Convention has contributed to stopping the illegal trade of certain species but its overall effectiveness in terms of the broad problem of illegal activities in the sector is limited. The Convention only covers species that are either already threatened or expected to be endangered in the near future. CITES is designed to control international trade, and therefore has no impact on domestic trade of illegally sourced species. CITES has a permit monitoring and tracking system but it is deemed weak on most accounts. Although the Convention is legally binding, it does not have the force national laws have. The enforcement mechanism is limited but it has used trade measures effectively against non-complying parties on certain occasions. But as in many cases its effectiveness depends to a large extent on the political willingness and commitment of trading partners to control illegal international transactions.

The Convention on Biological Diversity

In 2002, the Sixth Conference of the Parties to the Convention on Biological Diversity approved an expanded work programme including studies to assess the effects of unauthorised forest harvesting on fauna and flora, on indigenous communities and on government revenue. An issue to be addressed was the relationship between consumption in importing countries and unauthorised harvesting activities including those through international trade. Other activities included the evaluation and reform of legislation to include clear definitions of illegal activities, develop methods and build capacity for effective law enforcement, develop codes of conduct, and the development of product tracking systems. These initiatives are too recent to have produced substantive results yet.

The G8 Action Programme on Forests

At its 1997 Summit in Denver, USA, the G8 agreed to launch a programme on forests to accelerate the implementation of proposals for action advanced by the then Intergovernmental Panel on Forests. A major commitment was made at the G8 meeting in Birmingham, UK, in 1998 when the programme was formally launched. One of the programme's five areas of action is the control of illegal logging.

The G8 initiative put the issue of illegal logging into the forefront of international debate by establishing clear support to the concepts issued by the Intergovernmental Panel on Forests. It substantially increased the visibility of the international debate at the political level. The final report of the G8 programme was issued in 2002. This was followed up by the a declaration of continued support of actions against illegal logging and trade by the Banff G8 Environment Ministers' meeting (2003) and the April 2003 G8 Environment Ministers' Paris Communiqué which promised to support actions against illegal logging in Africa. The G8 commitment to continue to support actions against illegal logging was confirmed by the

Chair's summary of the 2003 Evian meeting. The Evian declaration also contained a statement committing G8 members to continue to assist countries with the adoption of modern technologies, such as satellite imaging, to help combat illegal logging. In 2005 the UK made illegal logging a priority area for its presidency of the G8, and the topic was discussed at the meeting of G8 environment and development ministers meeting, in Derby, UK. The resulting Communiqué from the Derby Ministerial was endorsed by the G8 Heads of Government at Gleneagles and an expert group was formed to provide an annual update to the G8 on progress against this agreement¹⁷. Both the German and Japanese Governments have since indicated their intention to address the issue of illegal logging during their G8 Presidencies in 2007 and 2008.

The Ministerial Conference on the Protection of Forests in Europe

The Ministerial Conference on the Protection of Forests in Europe (MCPFE) is a high level political initiative by 40 European countries and the European Community. It was launched in 1990 to combat threats to forests and promote the sustainable management of forests in Europe. The dialogue also involves, as observers, non-European countries, non-governmental and international organisations, forest owners' associations and the forest industry. The MCPFE process is based on a series of ministerial conferences. Ministerial decisions are then implemented on a voluntary basis by signatory states and the European Community.

At its fourth meeting in Vienna, Austria, in April 2003, the representatives of the signatory States and the European Community signed the Vienna Living Forest Summit Declaration: European Forests, Common Benefits, Shared Responsibilities, which commits parties to 26 actions. Two in particular have direct incidence on improving governance and fostering sustainable forest management not only in Europe but also in other regions of the world:

- To promote incentives for the protection and sustainable management of forests, and remove incentives with a negative impacts on forests and their biodiversity,
- To take effective measures to promote good governance and forest law enforcement, and to combat illegal harvesting of forest products and related trade, and contribute to international efforts to this end.

Signatories committed themselves to develop a work programme for the implementation of the commitments of the Fourth Ministerial Conference.

The Asia Forest Partnership

This initiative was launched at the WSSD in Johannesburg in 2002 as a "Type 2 action-oriented information exchange initiative". The partnership partners include 14 national governments, the European Commission, eight international organisations and a civil society organisation. Recognising that there are many initiatives to support sustainable forest management and the control of illegal forest activities in Asia, the purpose of AFP is to further promote cooperation in addressing urgent forest issues. The Partnership is not exclusively focused on illegal activities, although the combat of illegal logging and law enforcement figure prominently among its intended objectives.

The parties are expected to cooperate in various areas, many of which are of direct relevance to the control of illegal activities in the forest sector such as the development of tracking capacity and introduction of verification systems, promotion of measures by exporting and importing countries to eliminate export and imports of illegally harvested timber, international cooperation and coordination on trade statistics, information exchange on illegal logging and illegal trade, research and awareness raising.

The U.S. President's initiative against illegal logging

In 2003 the U.S. President launched this initiative that has the objective of assisting developing countries in combating illegal logging, the trade in illegal timber and corruption in the forest sector. It focuses on three regions, the Congo Basin, the Amazon Basin and Central America, and South and South-East Asia.

The initiative is based on four strategic actions:

- Good Governance, aimed at rationalising legal regimes and enforcement laws;
- Community-based actions, to foster community involvement in forest governance;
- Technology transfer, developing integrated monitoring systems and building in-country capacity; and
- Harnessing market forces, including the promotion of good business practices, transparent markets and legal trade, including country capacity to implement CITES.

The initiative contains several specific actions in the areas and regions of strategic priority, as well as several actions with a global scope, such as supporting projects through the ITTO to improve timber export and import data.

Several Departments of the U.S. Government are partners in this initiative, with the Department of State being the lead agency, as well as the Smithsonian Institution and industrial groups as well as conservation groups.

The International Network for Environmental Compliance and Enforcement

The International Network for Environmental Compliance and Enforcement (INECE) is a network of government and non-government enforcement and compliance practitioners from more than 150 countries. INECE's goals are: raising awareness of compliance and enforcement; developing networks for enforcement cooperation; and strengthening capacity to implement and enforce environmental requirements.

INECE hosts a forum on illegal logging (www.inece.org/forumslogging.html) designed to facilitate communication between geographically diverse practitioners and gives the opportunity to share experiences, to facilitate access to current ideas, publications, and events in enforcement and compliance.

ANNEX 3

INDUSTRIAL ROUND WOOD STATISTICS

Table A1 Production ~ Trade ~ End Use balance (rounded estimates, 2005)

Units: million cubic metres roundwood equivalent volume	Production			End Use			Net Imports			Residues			Imports			Exports		
	Total	Low Risk	High Risk	Total	Low Risk	High Risk	Total	Low Risk	High Risk	Total	Low Risk	High Risk	Total	Low Risk	High Risk	Total	Low Risk	High Risk
Both Sectors (NB rounded)																		
Canada	200	200	0	90	90	0	-200	-200	0	80	80	0	40	40	0	240	240	0
USA	420	420	0	640	610	30	170	140	30	60	60	0	270	240	30	100	100	0
European Union	330	330	0	480	420	60	50	-10	60	100	100	0	570	510	60	520	520	0
Japan	20	20	0	100	70	30	70	40	30	10	10	0	80	50	30	10	10	0
Russia	140	0	140	50	0	50	-100	0	-100	10	0	10	0	0	0	100	0	100
China	90	0	90	150	40	110	40	40	0	10	0	10	90	40	50	50	0	50
Tropical South America	120	80	40	80	50	30	-40	-30	-10	0	0	0	10	10	0	50	40	10
Tropical Africa	20	0	20	10	0	10	-10	0	-10	0	0	0	0	0	0	10	0	10
Temperate Southern Hemisphere	100	100	0	70	70	0	-50	-50	0	10	10	0	10	10	0	60	60	0
Other East Asia	110	10	100	90	40	50	-20	30	-50	0	0	0	100	50	50	120	20	100
Other Europe	50	50	0	60	50	10	0	0	0	10	0	10	40	40	0	40	40	0

Source: UNECE (2006) and ITTO (2005) are the default data source for most of the statistics of production. The data is cross checked and complemented by national sources and FAOstat (2005). Estimates have been made where suitable data has not been found. Tropical South America: Central and South America excluding Argentina, Chile, Mexico and Uruguay. Tropical Africa: Cameroon, Central African Republic, Congo (Brazzaville), DR Congo, Equatorial Guinea, Gabon, Ghana, Madagascar, Mozambique, Nigeria. Temperate Southern Hemisphere: Argentina, Australia, Chile, New Zealand, South Africa, and Uruguay. Other East Asia: Burma, Cambodia, Hong Kong, Laos, North and South Korea, Malaysia, Papua New Guinea, Philippines, Singapore, Solomon Islands, Taiwan and Thailand. Other Europe: Non-EU Europe including Ukraine and Turkey.

Production data

Table A1 estimates total world industrial round wood production for the year 2005 on roughly 1,700 million m³. This contrasts with around 1,800 million m³ suggested by FAO for 2005.

Estimates and revisions have been made to take account of anomalies, primarily when consumption (end use defined as Production + Residues + Imports – Exports) per head of population appears much larger or smaller than the norm for comparable countries.

Table A2 gives the most important examples of differences between several *official* estimates for industrial round wood production and the estimates in Table A1.

Table A2 Different estimates of Production taking into account Trade and End Use balance (in million m³)

Country	Hewitt	Several	FAO	Remarks
Sweden	90	90 (UNECE)	62	
Russia	153	138 (UNECE)	125	UNECE data implies end use of 0.03 m ³ /head in the Timber Sector (as typical in tropical Africa). By adding 15 million m ³ end use increases to 0.14 m ³ /head – more close to the use in similar countries like Romania and Poland.
Malaysia	26	23 (Malaysian Timber Council)	18	Without upwards adjustment the MTC and FAO data would imply given available trade figures that there was a negative timber consumption in Malaysia. The adjustment raises end use to 0.08 m ³ /head (similar to Mexico, Morocco and Turkey).
Indonesia	60	24 (ITTO)	33	As exports of the timber and paper sector each exceed 20 million m ³ Round Wood equivalent volume the ITTO and FAO estimates seem unrealistically low. The estimate in this analysis implies a 0.03 million m ³ /head – similar to estimates for Burma, Cameroon and the Philippines.

Import and export data

For this analysis, importing country declarations are regarded as more likely to reflect reality than exporting country declarations. Although the former tend to be more readily accessible than the latter, where the opposite holds, exporting country data have been used. For each bilateral product flow, imports are assumed to equal exports.

World Trade Atlas is the source used for most import~export statistics other than those of EU member states, Japan, and the USA (for which [Eurostat](#), [Japan Customs](#), and [US International Trade Commission](#) respectively are the source).¹⁸ Ideally, the most up to date and authoritative source should be used – Eurostat and World Trade Atlas rely on being provided with revisions and “updates” from their source countries. Given that Eurostat presents both weight and volume for products for which World Trade Atlas only provides volume, it is more difficult to identify and revise anomalous data using World Trade Atlas. Source data has been checked and revised where necessary in this analysis - volume data (and very occasionally weight data) tend to include gross (and minor) anomalies.

Table A3 Conversion factors used to estimate round wood equivalent volume

HS commodity code	Factor	Product description	Source
4401	1.15	Wood chips (also fuel wood and mill)	URS, Pers. Com. (2004)
4402	2	Charcoal	Excluded from this analysis
4403	1	Logs	Implicit
4404	2	Hoop wood	Negligible trade
4405	1	Wood flour	Negligible trade
4406	2	Railway sleepers	Assumed
4407	1.8	Sawn wood	ITTO and UCBD Annual Reports (by deduction from data presented); UNECE Forest Product Statistics 2000-2004
4408	1.9	Veneer	ITTO and UCBD Annual Reports (by deduction from data presented); UNECE Forest Product Statistics 2000-2004
4409	1.9	Profiles/Mouldings	Assumed
4410	1.4	Particleboard	ECE/TIM/BULL/50/3
4411	1.8	Fibre board	ECE/TIM/BULL/50/3
4412	2.3	Plywood	ITTO and UCBD Annual Reports (by deduction from data presented); UNECE Forest Product Statistics 2000-2004
4413	2	Densified wood	Assumed
4414	2	Picture frames	Assumed
4415	2	Packaging	Assumed
4416	2	Barrels	Negligible trade
4417	3	Tools	Negligible trade
4418	3	Joinery	Assumed
4419	3	Kitchen ware	Assumed
4420	3	Ornaments	Assumed
4421	3	Other items	Assumed
44*	2	Unspecified	EU only (usually negligible trade)
940161, 940169, 940190*, 940330, 940340, 940350,	2	Wooden furniture	Assumed
4701, 4702, 4703, 4704, 4705	4.5	Pulp (based primarily on new wood fibre)	Assumed
4706, 4707	0	Pulp (not based primarily on new wood)	Implicit
48	3.5	Paper (excluding printed books)	Assumed

Conversion factors

For Timber Sector products, if volume data is not provided by the source, then weight (or very occasionally surface area) is converted to wood volume using a notional world average of 1.4 m³ per tonne. Where appropriate, the thickness of veneer and panel products are assumed to be 1mm and 10mm

respectively when estimating volume from surface area. Where the only unit of measure is import or export value, the value *per* unit of wood volume or weight is assumed to be the same as that derived for similar products imported by (/exported from) similar countries which do publish statistics of weight and/or volume as well as value.

For the Timber and Paper Sectors respectively, this analysis converts volume (m³) and weight (tonne) into round wood equivalent volume by multiplying by the notional world average factors shown in Table A3 below¹⁹.

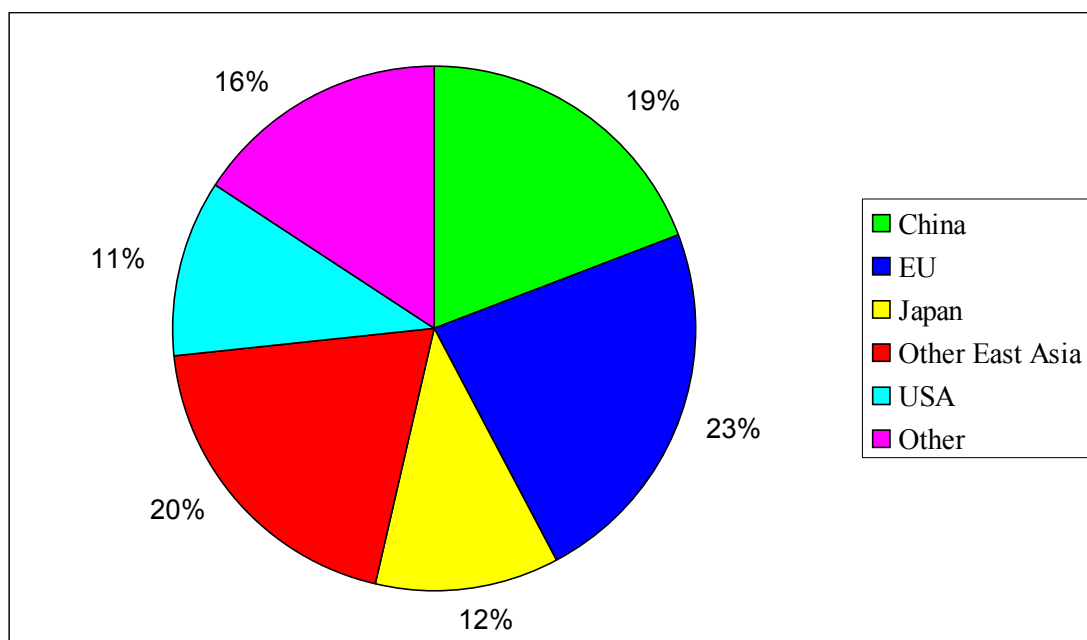
For example, using 1.67 or 1.9 (instead of 1.82) would reduce or increase the RWE volume of Russia's sawn wood estimated in this analysis by two and one million m³ respectively.

The factors used are more applicable as averages for world trade than in connection with individual countries – for which greater or smaller factors might be appropriate, depending on the country concerned.

Additional charts on imports from high-risk countries (2005)

The Charts refer to wood-based products (the timber and paper sector combined). The round wood equivalent volume shown in the charts is approximately 250 million m³.

Chart A1. Imports from High Risk countries (2005)



India, West Asia (including the Gulf States) and North Africa account for most of "Other".

Chart A2. Supplies from High risk countries/regions (2005)

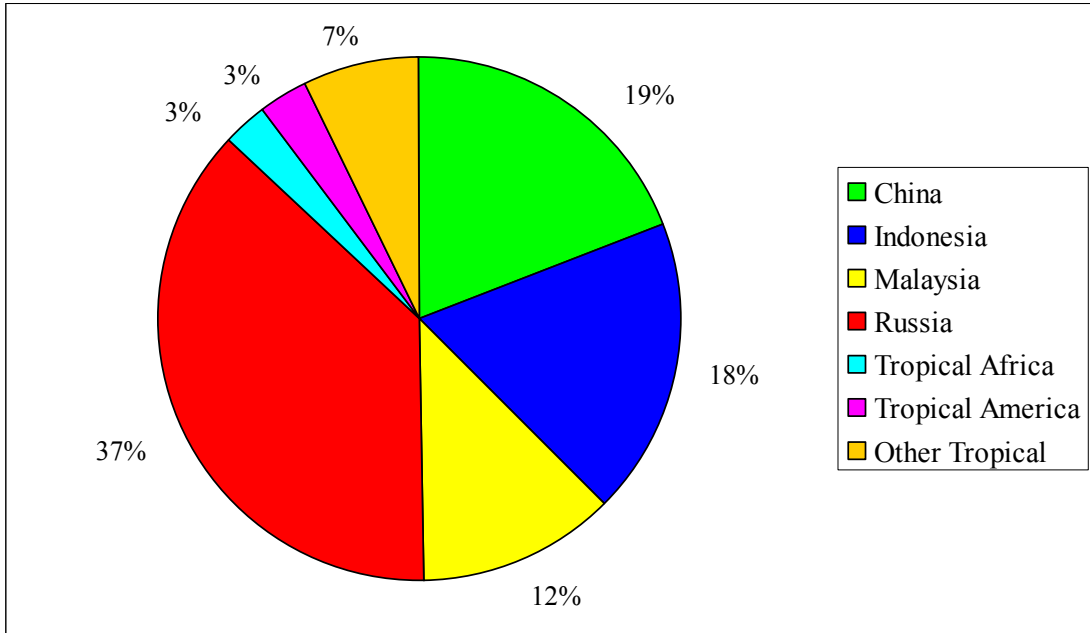


Chart A3. High risk imports of Primary and Secondary Products (2005)

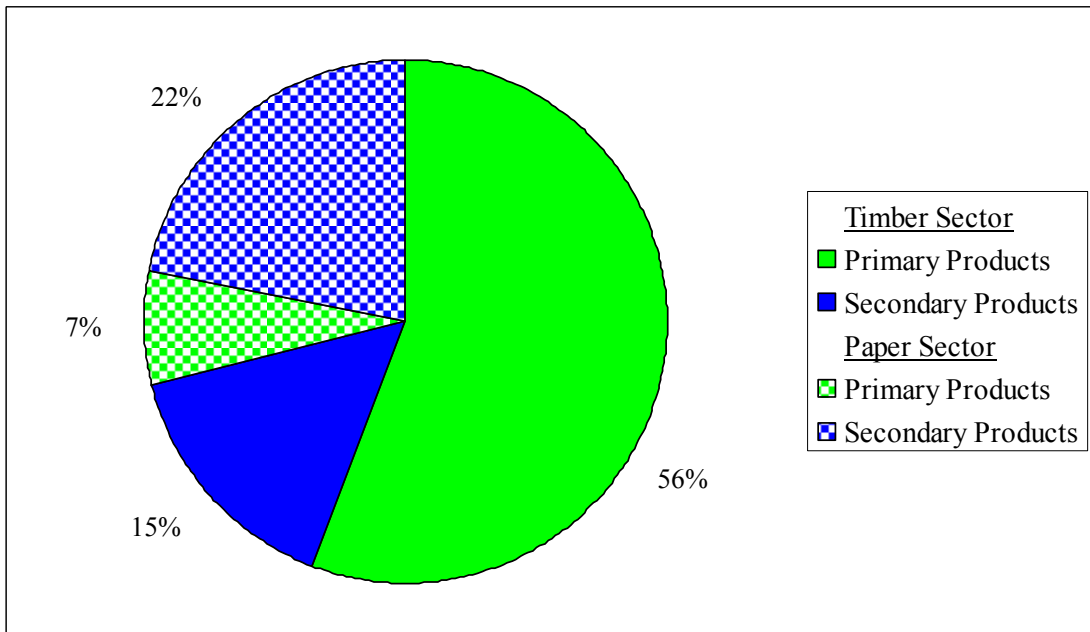
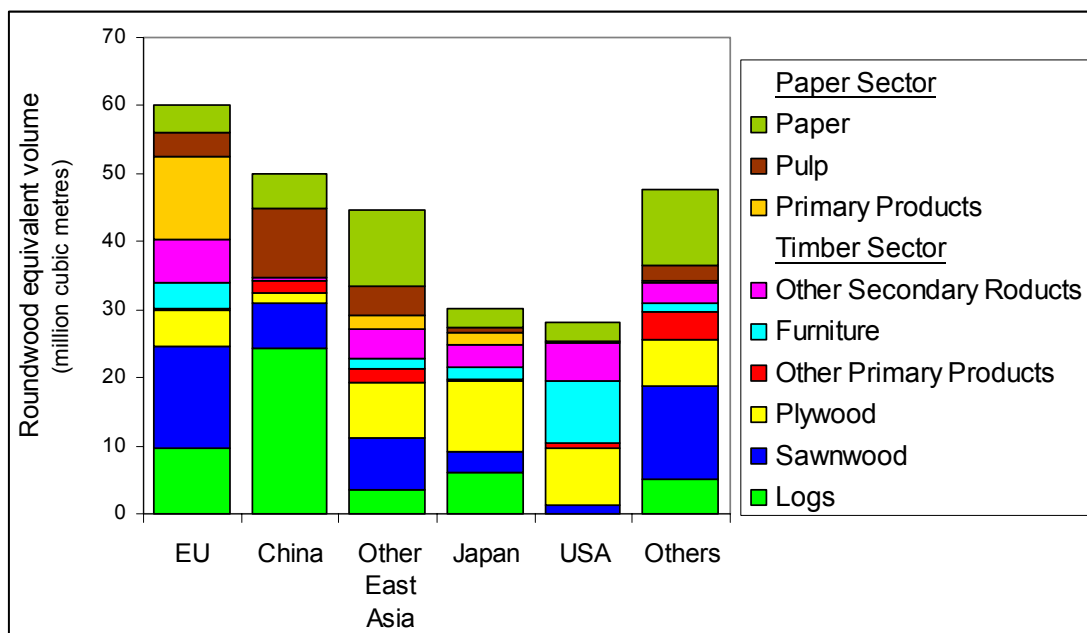
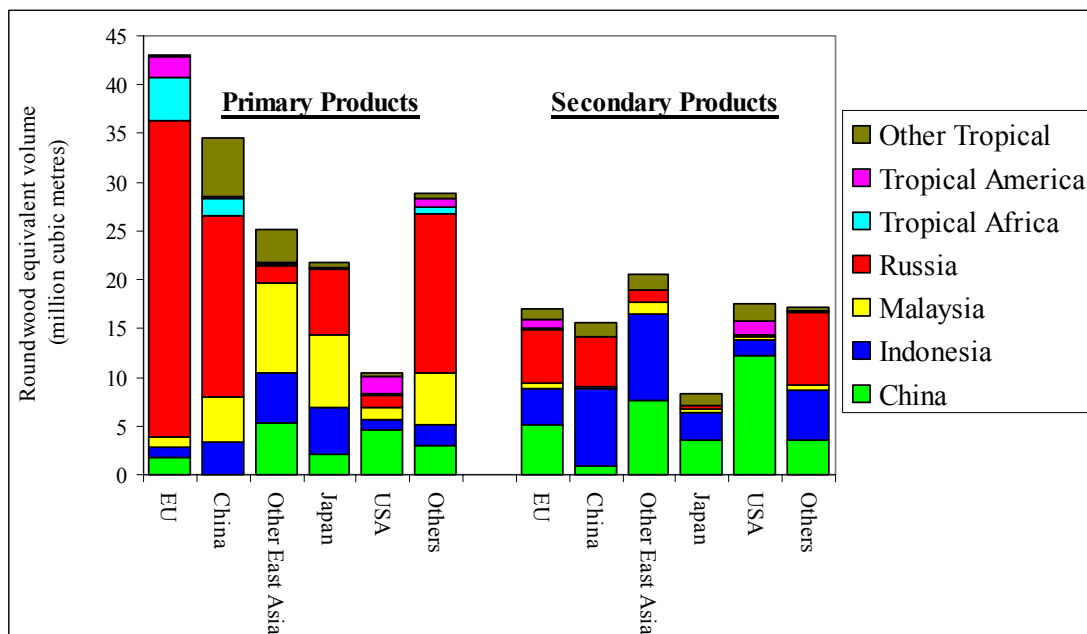


Chart A4. High risk imports of major importing countries/regions (by product, 2005)



India, West Asia (including the Gulf States) and North Africa account for most of "Other"

Chart A5. High Risk imports of importing countries/regions (by supplying country/region, 2005)



India, West Asia (including the Gulf States) and North Africa account for most of "Other"

ENDNOTES

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- ¹ Primary products are defined here as wood chips, logs, railway sleepers, sawn wood, veneer, OSB, Particle board, fibre board and plywood. Secondary products are defined here as wood-based products other than primary products.
- ² There are signals that the global deforestation rate in Brazil is somewhat overestimated but on the other hand the afforestation efforts in China seem also to have been less than reported (FAO 2005).
- ³ The World Bank (2006) report maps, with information from the Red List of the World Conservation Union, the location of all tropical forest with at least one threatened amphibian species and conclude (perhaps not surprisingly) that the incidence of threatened species is much higher in non remote areas in Africa and Latin America.
- ⁴ Although it is uncertain to what extent this will go at the expense of forest. This will depend on the countries and regions where the increase energy feedstock will take place.
- ⁵ Secondary products would tend to account for a lower share of the market in countries in which ‘timber frame’ housing accounts for much of the ‘new build’ housing market (e.g. the USA) than elsewhere (e.g. the UK). For secondary products end use per person tends to be related to average GDP per capita.
- ⁶ This section is based on White et al (2006) which gives an excellent overview of the position of China in the global market for forest products. All papers on China and the Asia-Pacific – Markets for Sustainable Livelihoods and Forests are available at www.forest-trends.org/programs/pacific_rim.htm.
- ⁷ The estimates of illegal logging as percent of production are based on different methodologies: 1) wood flow analysis; 2) interviews; and 3) comparing import and export statistics. Ideally, not only should a set of percentages be estimated annually for each of the most fundamental facets of a producer country’s trade in Illegal Timber (in relation to production from major concessions, these include concession allocation, adherence to credible management plan, illegal logging, economic crime) but those percentages should also be considered in relation to each of the most significant of the producer country’s major bilateral exports. For further information in this respect, see <http://www.globaltimber.org.uk/IllegalTimberPercentages.doc>
- ⁸ Estimated by using a weighted average of taxes evaded from available country estimates and scaling up by the total (global) value of logging.
- ⁹ World Bank (2006).
- ¹⁰ Data for 2004 from www.oecd.org/dac/stats/dac/reftables.
- ¹¹ Pursuant to the definition on foreign bribery in Article 1 of the OECD Convention, all countries that have signed the OECD Anti-Bribery Convention now have an offence that applies to any person who “intentionally offer[s], promise[s] or give[s] any undue pecuniary or other advantage, whether directly or through intermediaries, to a foreign public official, for that official or for a third party, in order that the official act or refrain from acting in relation to the performance of official duties, in order to obtain or retain business or other improper advantage in the conduct of international business.”
- ¹² See, for further information and references, www.oecd.org/corruption.
- ¹³ Corporate liability can be administrative rather than criminal, but must be equally effective and have equivalent sanctions.

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- ¹⁴ As with other business sectors subject to corruption, important sectoral initiatives exist. For example, Transparency International, the World Bank and others have supported the Forest Integrity Network, which focused on corruption-related issues in the international forestry industry. See <http://legacy.transparency.org/fin/index.html>. In addition, the multilateral development banks have been adopting strong anti-corruption policies which include the possibility of debarment for companies that engage in foreign bribery.
- ¹⁵ http://eur-lex.europa.eu/LexUriServ/site/en/com/2003/com2003_0251en01.pdf
- ¹⁶ This is pointed out in several papers by Brack, Gray and Hayman (2002), Brack and Saunders (2006) and Brack (2006). They can all be found on the [illegal-logging.info](http://www.illegal-logging.info) website that provides background information on the key issues in the illegal logging debate and is supported by Chatham House - www.illegal-logging.info.
- ¹⁷ One of the recommendations presented to Ministers prior to the 2005 summit was that bilateral estimates should be made of Illegal Trade to facilitate policy design. Though no attempt to do so seem yet to have been made.
- ¹⁸ Sources of other national statistics include Hong Kong Merchandise Trade Statistics, Thailand's Customs Department, Malaysia Trade Council (for exports only), China Customs Statistics Yearbook, Korea's Statistical Yearbook of Foreign Trade, Indonesia's Statistik Perdagangan Luar Negeri Indonesia Taiwan's Monthly Statistics of Imports.
- ¹⁹ For other conversion factors please refer to: the worksheet "Conversion Factors" at:
http://www.unece.org/trade/timber/database/fps00_04.zip : p279 of
<http://www.svo.se/fakta/stat/ska2/kapitel/bilagor.pdf> for some alternative factors; and p69 http://www.forest-trends.org/documents/publications/China%20Import%20Working%20Paper_06-05.pdf. For conversion factors used a more detailed method of analysis for paper products, see <http://assets.panda.org/downloads/chinawoodmarkettradeenvironment.pdf>