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Extra – sectoral impacts on trade in forest products and sustainable forest management

A background paper for the Global Project: Impact Assessment of Forest Products Trade in Promotion of Sustainable Forest Management

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CIRAD

Executive summary

Assessing the impact of sectoral and extra-sectoral factors on trade and sustainable forest management is challenging for several reasons. First, because of a high degree of *interrelationship* among different factors. A single factor may operate in diametrically opposite ways according to the context and the specific layout of this interrelationship. Second, because one of the main challenges with the concept of SFM is the treatment of *conflicting objectives.* Those conflicting objectives may arise when forest quality is an issue; they also arise because Sustainable Forest Management can be understood in two ways: as a land use issue or concerning logging areas. In some cases, SFM will have a significant impact on the forest frontier, in other cases mainly on logging areas, and sometimes on both of them. Finally, assessing the impact of extra-sectoral factors on trade and SFM means assessing *sustainable development* in the long run which does not coincide with the number of hectares remaining under forest cover.

The hypothesis made in this study is based on the idea of the "*environmental Kuznets curve*", as many environmental assets are based in developing countries which have not yet made their "demographic transition" nor stabilized their institutional framework. There are numerous factors which are impacting forest cover and density in the short run, such as infrastructure buildings as roads, technical progress in agriculture (under some specific conditions), or demographic growth. In any development process, especially when considering a low populated and widely forested country, they are unavoidable. However, the extent of their impacts can be controlled if appropriate measures are designed and implemented. Thus, successful transition processes need good "mixes" – and even sometimes good luck. But one cannot imagine a radical alternative to this historical process. As a consequence, one should distinguish systematically between short run and long run effects.

In the center of the study is the impact of *trade* in forest products and services on sustainable forest management, and thus on sustainable development. Global trade in forest products has nearly doubled between 1985 and 1995 which makes it an important factor to be considered. If the volume of trade is one element, its nature is another. World trade has been changing fundamentally over the last decade due to 'globalization': there was substitution taking place, consumers were becoming more discerning and better informed of the various new products and new suppliers were emerging.

The impact of extra-sectoral factors on *timber trade* is evident, but the impact of timber trade on the overall strategies of sustainable forest management and sustainable developlment seems to be more complicated. In this study, we support the idea that trade changes the profitability of the concession and has thereby an influence on SFM. It is important to stress the possible importance of this agrument, as regional and subregional integration is underway in various parts of the world and the importance of trade may widen. . But we also show that there is a direct influence of extra-sectoral factors on forests. In turn, this relationship can have an influence on trade and a feed back impact on SFM. The main relationships we are going to consider in this study are summarized in table 1

As a first conclusion, we may say that the real challenges lay in the long term. SFM will be effective only if sustainable development is implemented. Otherwise, successes in SFM at the local level will remain fragile: decision processes can be reversed if the legal system is not reliable, property rights might not be enforced, and poverty will remain widespread. Extra-

sectoral impacts on trade and SFM do thus crucially depend on the overall development path the country follows. ESF can be classified in the following main categories:

1. Macroeconomics

Economic growth stimulates demand for agricultural, forestry and mining products. This may boost internal markets as well as trade, because of increased needs in machinery and investment. In the long run, this may lead to economic development and may be beneficial to SFM. Ailing economic situations, on the other hand, render SFM more difficult. Famous examples are Asian countries in the wake of and after the financial crisis, Central African and some South American countries and the economies in transition, such as Russia.

The government may assign a strategic role to certain sectors within the overall development strategy by favoring one sector over another. Clearly, this choice depends to a great extent on wider socio-economic variables such as relative prices and exchange earnings in different sectors, on poverty or population growth. Examples are Gabon's decision to allocate oil-export earnings to sectors other than agriculture, which has considerably reduced the pressure on the forestry sector. On the other hand, declining oil revenues and the following unemployment crisis in Cameroon have led to migration towards forested areas and thereby increased the pressure on the forest resource.

Relative price changes play a major role in investment choices by the government. Real-exchange rate depreciation favors the expansion of tradables over non-tradables which generally encourages expansion of agriculture, logging and mining. However, here again, the impact depends on the strategic choices the government makes: for a more or less almost single-commodity exporter like Gabon, the 1994 FCFA devaluation had much less real impact than for other countries.

SAPs are at the origin of liberalisation an increasing private sector involvement and privatisation. Overall, SAPs target factors which hinder SFM. They should have positive long term effects, but do not always have. One possible reason for insufficient performances of SAPs is their often partial application

2. Agricultural Trends

Agricultural activities are often referred to as one of the major causes of forest decline and unsustainable forest management. Also, policies which seek to improve the terms of trade for agriculture, such as currency devaluations, trade liberalisation, reductions in agricultural export taxes, agricultural price subsidies, and reduced fiscal spending on non-agricultural sectors tend to raise prices received by farmers, and hence increase deforestation.

Overall the impact of increased agricultural productivity on trade and SFM is not straightforward. It depends on several factors such as land tenure arrangements, demographic changes, the rate of urbanization and rural-urban migration flows, relative prices, or the elasticity for food demand.

The direct impact on SFM might be negative in the short term, as it will give incentives to clear more forest land. However, it may be positive in the long run, as long as technological progress goes along with agricultural intensification.

3. Energy and Mining

The mining sector always plays an important indirect role. An oil or mining boom creates rent opportunities which may or may not be used for SFM. Imports will increase, and depending on the nature of imports, the impacts on SFM will be different. If more food products are imported, the domestic food crop market will shrink and marginal farmers are likely to move to urban areas, which decreases pressure on forest land.

Overall, if governance is optimal, rents may be invested in order to induce SFM and induce long term development. If governance is weak, rents may be directed to consumption, which may have negative effects on SFM, depending on the direct threats to the forest surface throught population growth and agricultural development.

4. Investments

Investments are a key in the relationship extra-sectoral influences-trade-SFM. They have a very direct impact on trade, as they affect competitiveness or the accessibility of forests. Decreasing transportation costs, investments have the same impacts as currency devaluations. In the medium and long run, they may lead to a dramatic reduction of forest cover. In general, investment does not mean investment in sustainable management. It may raise *production capacities* and stimulate unsustainable production methods, mostly oriented at export earnings. Indonesia's pulp and paper industry is a famous example for this. On the other hand, certain investments are a prerequisite for sustainable forest management and indirectly help to access certain export markets, especially in Europe.

Poor access to funding is one of the main reasons why sustainable forest management is difficult in tropical forestry countries. Where internal sources are weak, international public funds and foreign direct investment play a critical role. However, there is a marked decline in official development assistance and public international public funds for SFM are smaller than announced in the Agenda 21 target. Various risks hinder the access to funding: often, the country risk is high, due to war and conflict, but also du to administrative and policy failures. The behaviour of the private sector can also be explained by these risks. On the other hand, transparency in the private forest sector also often leaves to be desired and external funding for forest projects will not increase considerably as long as the transparency in the sector is weak.

Despite the above mentioned difficulties, investments in particular sectors and technologies in support of SFM do exist. Changes in the forest sector are likely to facilitate SFM, as they improve efficiency in some parts of the sector (especially plantations), and decrease the pressure on other parts: use of more species, smaller logs, better processing and harvesting technologies and higher productivity, especially in the plantation sector. Biotechnology development is one example of such investments. *Information* networks facilitate trade and render forest management more transparent. This might make the distinction between sustainably and unsustainably managed forest systems easier and also contribute to the functionning of certification schemes. *Road construction* facilitate trade in forest products and services. The road system can affect production location and lead to new market chains. Clearly, roads contribute also more directly to the deforestation process, especially by facilitating access to remote areas. However, often, simple changes in the design of road systems would produce a noticeable impact.

Overall, there are two closely interrelated policies to be implemented: facilitating access to finance (and thus decrease discount rates) *and* channel investments towards SFM, i.e. improve environmentally sound technologies and allow for more transparency and information. The latter, in turn, facilitates access to finance etc. Also, industrial development has to be connected to the overall development strategy of the country

5. Institutional Context

Weak overall government structure is most often expressed in *insufficient enforcement mechanisms* and *lack of control* resulting in *illegal activities*. Often *corruption* is a major reason for unefficient government intervention. Illegal and corrupt operations are likely to have an important effect on forest management (and trade) because they increase investment risks and thus reduce the propensity of investors to implement sustainable managment programmes.

Efforts to resolve conflicts and wars are also important. First, resolution of conflicts leads to higher transparency and mining of resources becomes more difficult. Second, conflict solving leads to higher stability and might attract capital. Resolving conflicts seems, thus, is a necessary condition for trade.

As for decentralization and community participation, they might lead to better tenure rights and thus easier control of the resource, implying stabler management and better direction of governmental aid. If this is the case, their might be room for expansion of some of the local forest products on international markets. On the other hand, this supposes that financial flows reach the decentralized government bodies.

Some particular government policies are also important in the relationship ESF-trade-SFM. Notably subsidies may unintentionally cause forest decline: for example subsidies affecting forest raw materials or subsidies affecting competitive uses of lands or price controls. Likewise reducing tariffs and imposing trade restrictions for manufactured imports shifts the terms of trade in favor of agricuture and forestry and thus tends to have similar effects on forests as a devaluation.

There is some empirical evidence that ‘the pressure to earn foreign exchange and repay debts may force governments to quickly exploit forest resources for export. However, results are mitigated. As a conclusion we can state that, in the long run and in general, heavily indebted countries tend to increase the pressure on the forest resource, whereas the impact in the short run is not clear.

5. Demography and Health

Numerous authors have studied the influence of population growth on deforestation, and many of them find a negative relationship. Clearly, population growth is one factor which has an important direct impact on the forest sector and forest product management through both, *higher pressure on land* and *increasing demand* for agricultural and forest products (construction timber, fuelwood).

As for the influence of population growth on trade, it seems that it might have an important influence on supply and demand for forest products, both concerning the amount of products and the type of products demanded. Combined with urbanization, population growth might

lead to the creation of huge market chains in small spatial areas which could render trade more competitive and efficient. However, the direct impact of ESF on SFM is important in this case. Transition processes render SFM more difficult because they cause land-tenure instability.

Finally, HIV is an important long run factor influencing SFM. Any long term development might be hampered by the problems caused by HIV. On the other hand, SFM might be an instrument to prevent further spreading of the desease.

Policy Recommandations

General policy recommendations are difficult to formulate if one would like to avoid obvious ones, such as 'improve governance'. As it has been shown most extra sectoral factors might have a foreseeable impact on trade, but this impact is hardly translatable into a likely impact on SFM. Indeed, the trade – SFM relationship is highly context-depending.

If the objective were merely "avoiding deforestation", several recommendations could be formulated (i.e. less transportation infrastructure in forested areas, no subsidy for fuel in rural areas….) with a likely impact on forest margins and secondary forests. But as SFM is at stake, and considering our "Kuznet-curve hypothesis", one should consider differently what happens at forest margins and what happens within the concessions or community forests. If SFM has to be financially viable, outputs (wood, NTFPs, etc.) should be traded and this implies markets and transportation networks. Thus, there can be trade-offs between economic viability of SFM within concessions and deforestation at forest margins. Nevertheless, we can evaluate the impact of some extra-sectoral factors on SFM:

- Clearly positive impacts:
    - Land tenure security
    - Institutional stability
    - Good governance
    - Demographic transition achieved
    - HIV/AIDS low prevalence ratio

- Clearly negative impacts (in addition to the opposite of ESF above):
    - Agricultural intensification through mechanization in agricultural frontiers (forest margins)
    - Directed settlements in forest areas
    - Improving access to credit for beef cattle, mechanized agriculture, and large-scale forest and tree crop plantations in areas with substantial natural forests
    - Energy and mining projects in forested areas

What governments can do is acquiring or reinforcing impact analysis, especially when they deal with agricultural development. Agricultural projects and policies conducted in developing countries are rarely assessed with regard to their likely impact on deforestation, on one hand, and SFM, on the other hand. There are "best practices" that can be used as substitute for several "lose-lose" agricultural projects such as small-scale irrigation and labor-intensive agriculture in regions with substantial migration to the agricultural frontier (Kaimowitz and Angelsen, 2003). Energy and mining projects in forested areas are much more difficult to discourage, as the financial attraction is generally extremely high for

governments (“win-lose” situation). There, donors – if they are influential – can demand environmental impact assessments before any implementation decision. Finally, government and donors should develop and use adequate guidelines for assessing the impact of transportation investments on forest conversion and forest degradation. These could include the use of spatial models to estimate the probable forest loss resulting from improved access.

1. Definitions, General Relationships and Scope of the Study

The world's forests are subject to forest management policies and other, extra-sectoral influences. The latter include all factors which have any direct or indirect impact on the forest sector, such as the use of forest as agricultural land or mining area, population growth, devaluation, investment, demand for food, public policies, urban development, settlement, property issues, regional development and general economic growth. They may even concern elements which are much more difficult to assess, such as 'distribution of economic and political power, attitudes towards corruption, …flaws in the market system…(or) in seemingly unrelated government policies' (Contreras-Hermosilla 2000).

Extra-Sectoral Factors, Sustainable Forest Management and Sustainable Development

Assessing the impact of sectoral and extra-sectoral factors (ESF)on trade and sustainable forest management is challenging for several reasons: first, all the 'underlying causes' of forest decline are characterized by a high degree of *interrelationship*. Indeed, according to Contreras-Hermosilla (2000) various explicative factors may form 'a complex socio-economic, cultural and political event' which implies that 'a single force, such as agricultural intensification, may operate in diametrically opposite ways.' (Contreras-Hermosilla 2000). Thus, the focus of this study is on extra-sectoral factors, but their interrelationship with sectoral factors may force the authors to take parts of these factors into account.

Second, as with other definitions on sustainability, the main challenge with the concept of SFM is its application and the treatment of *conflicting objectives.* Sustainable forest management ' refers to meeting present needs for forest goods and services, while ensuring their continued availability in the long term.' (FAO SOFO 2003).

Conflicting objectives may arise when forest quality is an issue. Whereas forest decline is an unambigous indicator for unsustainable forest management (FAO), forest degradation may or may not be compatible with SFM, depending on the objectifs to be achieved, for example, whether SFM refers to biomass regeneration, to biodiversity conservation (van Soest 1998) or to carbon stocks.

Also, sustainable Forest Management, as a generic expression, can be understood in two ways: concerning the forest frontier, i.e. as a land use issue (e.g. the interface agriculture – forest), or concerning logging areas, i.e. as a forest degradation issue (eg unsustainable logging). In some cases, SFM will have a significant impact on the forest frontier, in other cases mainly on logging areas, and sometimes on both of them.

Likewise, the problem is different whether 'microscopic sustainablility' or 'macroscopic sustainability' are at stake (see also Raga Castellanos 2001). Whereas the first requires stustinability at the level of each foret stand, the latter argues it should be assessed at a larger landscape level, allowing for a variety of different management forms at the smaller level.

Finally, assessing the impact of these factors on trade and SFM is particularly challenging because it means assessing *sustainable development* in the long run which does not coincide with the number of hectares remaining under forest cover. Indeed, speaking about SFM means making assumptions on sustainable development i.e. the way developing countries choose to reach environmental, economical and social goals.

The hypothesis we make in this study is based on the idea of the "*environmental Kuznets curve*", as many environmental assets are based in developing countries which have not yet made their "demographic transition" nor stabilized their institutional framework.

There are numerous factors which are impacting forest cover and density in the short run, such as infrastructure buildings as roads, technical progress in agriculture (under some specific conditions), or demographic growth. In any development process, especially when considering a low populated and widely forested country, they are unavoidable. Often, these changes are necessary for a certain transition process: agricultural intensification is unconceivable in low density areas (see Boserup), infrastructure is a key condition for an accumulation process in agriculture etc. However, the extend of their impacts can be controlled if appropriate measures are designed and implemented.

Obviously, nothing is mechanical. Contrary to what is often stated, population growth might not lead to any intensification. For example when people are not able to meet other conditions (as land tenure security, ore re-investment), when they are not able to overcome internal conflicts or when they prefer avoid social changes, they may chose to mine their natural resources and migrate subsequently (see table of impacts). Likewise, roads can lead to rapid destruction of forests frontier without any positive feedback on agricultural transformation. Thus, successful transition processes need good "mixes" – and even sometimes good luck. But one can not imagine a radical alternative to this historical process. As a consequence, we will distinguish systematically between short run and long run effects. Concerning the last, we implicitly assume that it starts after the "transition period" of the Kuznets curve, i.e. after a combination of demographic and institutional transitions.

Trade and Sustainable Development

At the center of the study is the impact of *trade* in forest products and services on sustainable forest management, and thus on sustainable development. Global trade in forest products has nearly doubled between 1985 and 1995 (Bob Flynn) which makes it a factor to be considered in the determination of sustainable development. Typically, extra-sectoral factors may have been boosting trade and this may have improved opportunities for SFM and development.

But before assessing the impact of trade on SFM, two important distinctions have to be made: first the distinction between trade in wood and trade in other goods and services. Wood trade generally impacts only logging areas whereas trade in other goods and services will have various impacts on both, the forest frontier and logging forests. Second, it is important to distinguish between trade in wood products and trade in forest services.

The impact of extra-sectoral factors on *timber trade* is evident, but the impact of timber trade on the overall strategies of sustainable forest management and sustainable developlment seems to be more questionnable. This concerns first and foremost the tropical timber trade. Indeed, according to Barbier et al. only some 6% of tropical industrial roundwood enters international trade (Barbier, E. Burgess, J. Bishop, J., Aylward, B.). This means a large part of the tropical forest sector is not affected by trade but by the internal markets, mainly for fuelwood and construction wood. The impact of trade in *forest services* on sustainable development seems to be more straightfoward, as conservation seems to be primarily supported by trade, e.g. eco-toursim.

Some authors have come to the conclusion that trade in forest goods and services does not play any important role in deforestation, but only extra-sectoral influences do : 'deforestation is primarily linked to factors other than international trade, such as changing production patterns, expanding demand for food etc (Intergouvernmental Panel on Forests in Franziska Hirsch 1999). We do not adopt

this point of view, but rather support that trade changes the profitability of the concession and thus has got an influence on SFM. Nevertheless, we agree that the influence of extra-sectoral factors on forest margins is direct and important. This, in turn, can have an influence on trade and then back on SFM. The main relationships we are going to consider in this study are summarized in table 1.

Furthermore, regional and subregional integration is underway in various parts of the world (FOSA 2001) and this may widen the importance of trade. This 'further expansion of trade will depend upon improvements in infrastructure and, more importantly, increasing purchasing power' (FOSA 2001). Also, especially in the industrial hardwood and the pulp and paper sector, trade remains still important (ITTO 2000). Indeed, great part of most legally cut timber enters trade. What is more, trade does constitute an integrated part of the market and organisation strategies of forest compagnies. In addition, marketing strategies are directly related to the kind of markets targeted.

If the size of trade is one element, its nature is another. Trade has changed and has become a probable factor of importance for SFM in general. According to Adams, world trade has been changing fundamentally over the last decade due to 'globalization' : 'there was substitution taking place, softwoods for hardwoods, temperate hardwoods for tropical hardwoods, particleboard, OSB and MDF for plywood, but there were also more subtle changes in the market place and along the supply chain'… Consumers were becoming more discerning and better informed of the various new products …and new suppliers were emerging … as added value product exporters of note (i.g. Malaysia).' Certification also gained of importance, but only in some parts of the world, especially Europe and North America (Adams).

Thus, not only the demand level (e.g. volume of logs), but also the kind of the demand (e.g. processed or un-processed wood) and the product qualtiy (e.g. certified or non-certified timber) are key to explain the influence of trade on SFM.

As a first conclusion, we may say that the real challenges lay in the long term. SFM will be effective only if sustainable development is implemented. Otherwise, successes in SFM at the local level will remain fragile: decision processes can be reversed if the legal system is not reliable, property rights might not be enforced, and poverty will remain widespread. Extra-sectoral impacts on trade and SFM do thus crucially depend on the overall development path the country follows. The criteria defining SFM are unlikely to be determined a priori, but it is important to consider SFM in a broader sense than only as the adoption of reduced impact logging in few huge industrial concessions in remote areas.

2. Sectoral and Extra-Sectoral Factors

The separation between sectoral and extra-sectoral factors is not always evident, as interrelationships are important. The following tables distinguish between non-ambiguous sectoral factors and non ambiguous extra-sectoral factors (table 1) as well as cross-cutting factors (table 2).

Table 1: Classification of Sectoral and Extra-Sectoral Factors

Non ambiguous extra-sectoral factors	Non ambiguous sectoral factors
exchange rate	concession regime (size, duration, granting policy, etc.)
Economic growth	legal tenure arrangements within the PFE
Sectors competing with forestry	wood price trends
agricultural trends and agricultural public policies	technological progress in wood processing
demographic growth and migration	forest certification
mining	wages in the forest sector
economic liberalization and SAPs	public policies aiming at effective or nominal protection in the forest sector
investments	public awareness in consumer countries
risk perception	forest taxes
infrastructure	
governance and corruption	
degree of poverty	
public policies	
management of international debt	

Table 2: Cross-Cutting Factors

Cross-cutting factors
relative prices wood/substitute
overall fiscal policies impacting wood production costs
public policies about market and mechanisms for environmental services
policies on indigenous land rights

3. Extra-Sectoral Factors

The following part discusses the extra-sectoral impacts on trade and SFM. More precisely, we distinguish between extra-sectoral factors, trends and policies. Factors are static elements, such as facts and figures, e.g. population level, factors, as "static" facts and figures; e.g. population level, GDP/capita, HIV prevalence, education level, corruption level, land tenure security, risk perception or relative prices. Trends are processes, which describe the dynamics of the above figures; e.g. demographic or economic growth, inflation, oil boom, money devaluation, or infrastructure building. Policies, finally, are elements which shape trends and prepare new facts. They include SAPs, deflationary policies, wage policy, taxation policy, financial liberalization, sectoral investments, land distribution reforms, or policies on indigenous rights. It is important to stress that not all facts are due to a policy and, likewise, not all trends result from a policy; there are also unexpected dynamics from a given policy and this must be kept in mind when designing "policy recommendations".

As it is important to stress the relationship between the different factors, trends and policies, the following overall issues are being discussed: macro-economics, agricultural trends and policies, infrastructure and transportation, energy and mining, the institutional context, demography and health.

1. Macroeconomics

Economic Growth, Poverty and Sectors Competing with Forestry

Economic growth stimulates demand for agricultural, forestry and mining products. This may boost internal markets as well as trade, because of increased needs in machinery and investment. In the long run, this may lead to economic development and may be beneficial to SFM, but this is conditional on other variables, such as investment in the forest sector or land-use decisions.

The government may assign a strategic role to certain sectors within the overall development strategy by favoring one sector over another (Wunder 2000, van Soest 2000). Clearly, this choice depends to a great extent on wider socio-economic variables such as relative prices and exchange earnings in different sectors, on poverty or population growth, but it can clearly be sustained by governmental decisions.

Favoring the agricultural or mining sector over forestry might have direct consequences with respect to land use change. Wunder (2000), for example, shows that Gabon's decision to allocate oil-export earnings to sectors other than agriculture has considerably reduced the pressure on the forestry sector. Van Soest (2000), on the contrary, shows that declining oil revenues and the following unemployment crisis in Cameroon have led to migration towards forested areas and thereby increased the pressure on the resource. According to FAO (XYZ), 'much forest conversion has been stimulated by policies to promote agriculture through giving land title and/or compensation to people clearing land for agricultural use. But the impact of agricultural policy is complex as it depends on the stage of forest development…At the forest forntier, (for, example, they) have had a substantial impact'.

Moreover, land use choices may also channel national and international aid, which most often take the form of direct subsidies or trade policies. In general, funds seem to be more easily allocated to sectors that are already 'chosen' and this has important impacts on internationally competitiveness in different areas, also SFM.

Ailing economic situations render SFM difficult. Famous examples are Asian countries in the wake of and after the financial crisis, Central African and some South American countries and the economies in transition, such as Russia. The latter hosts 'one of the world's most extensive natural forests, (but) faces particularly difficult problems in promoting the sustainable devleopment of what potentially

could become one of its principal renewable export sources'. (Franziska Hirsch 1999). Closely linked to this are the problems of poverty and highly skewed income distributions (Ekbom, Bojö 1999) which make that, 'people will continue to depend upon forest resources, but may not be able to invest in managing them sustainably' (FOSA 2000). Indeed, in Africa for example, rural poverty is estimated at nearly 60% and urban poverty at some 40%. ' (FOSA 2000). As Kaimowitz and Angelsen (1998) note, development processes are heavily path dependent.

In developing countries, allocations of public funds to the forest sector are low: 'even in countries where forests generate substantial surpluses, investment in forestry has been very low' (FOSA 2001). What is more, this goes along with very low overall GDP and growth rates in many countries. As for Africa,'there is considerable potential of implementing sustainable forest management in a number of forest rich countries' (FOSA 2001). Countires like Gabon, Equatorial Guinea, Angola and the DRC have alternative – and probably more valuable-resources like oil and minerals, so there is less need to rely on forests as a source of revenue. (But) much of the problem relates to the ability to capture the income form these resources and use it effectively for sustainable development'(FOSA 2001).

According to Wunder and talking of Gabon 'Oil wealth was generally allocated with a strong urban bias, favouring prestige projects in urban construction, infrastructure in parastatal companies and in urban social sectors. The indirect impact (of most public projects) was to massively pull labour out of rural areas towards remunerative employment options in the cities, as civil servants, in parastatal companies, in services or in construction.' (Wunder 2000). Again, according to Wunder, 'this urban development bias, and the correspondent neglect of agriculture, is likely to have reduced pressures on forests.' The inverse conclusion can be drawn for countries which can not or not anymore built on steady oil revenues. Van Soest takes the example of Cameroon, where the decrease in oil revenus and the following economic crisis has lead to unemployment in urban areas and to a population shift back to rural and forested areas.

However, this also raises the question of priorities in the overall development of a country. Given the severe problems that causes poverty and AIDS in several regions of the world, it may be questioned whether SFM belongs to the top priorities. '…governments will be forced to use their limited resource for healthcare and AIDS prevention efforts' (FOSA 2001) On the other hand, certain kinds of SFM may reduce poverty and strengthen the political power of decentralized entities, especially in the long run.

Exchange Rate

Relative price changes play a major role in investment choices by the government. According to FAO (XYZ), over-valued exchange rates may reduce pressure on forests and thus deforestation. Likewise, Kaimowitz (1998) states that 'real-exchange rate depreciation favors the expansion of tradables over non-tradables….That generally encourages expansion of agriculture, logging and mining.' But whether or not this implies more extensive land use depends on the land use and technology choices made (see agriculture). However, imports of capital goods become more expensive and this could be an indicator for the likely expansion of extensive land use patterns. If the price differential are due to inflation, this may 'promote forest clearing by stimulating land speculation and/or lowering real wages' (Kaimowitz 1998).

However, as Wunder points out, 'for a more or less almost single-commodity exporter like Gabon, the 1994 FCFA devaluation had much less real impact on competitiveness and economic structure than in CFA-zone countries with a more diversified productive base' (Wunder 2000). In an econometric study, Wunder (2000) shows that for Gabon, 'real exchange rate appreciation during 1966-97 is positively influenced by oil export revenues and capital inflows (both in 1995 US$). .The real exchange rate, as an independent variable, has the expected negative impact on agricultural output (in

fixed 1995 US$; Regression 2) and on timber production (in cubic meters; Regression 3). Both coefficients are significant at the 1% level, but the competitiveness variable explains much less of the variation in agricultural output (R^2=44.26%) than in timber production (R^2=71.61%).' This supports the assumption that land use choices are influenced by macroeconomic variables.

Structural Adjustment Programs(SAPs)

SAPs are at the origin of liberalisation an increasing private sector involvement and privatisation. For the possible positive impacts of these policies, see the corresponding sections (liberalisation, investment, real exchange rate). In the following, we will focus on the critical analyses of SAPS.

Contreras-Hermosilla notes that 'SAP's may unintentionally encourage forest decline for three reasons : first, they may induce unemployment and greater poverty leading to migration to forest areas… Second, SAPs often stimulate agricultural exports at the expense of forested land…Third, SAPs may 'stimulate forest exports based on unsustainable methods'. Kaimowitz goes even further by claiming that SAPs 'tend to boost production of tradable goods without successfully promoting more difficult institutional reforms that could counterbalance the increased pressure on forests'.

Indeed, it seems that the influence of SAPs do particularly concern the forest sector: 'the expansionary impacts of currency devaluations, tariff liberalization and reduction of real interest reates may be most directly and adversely felt in the natural resource use' (World Bank quoted by Contreras-Hermosilla 2000).

Kaimowitz also questions some internal organisation issues of the World Bank policy. For example he notes that 'conditionality tends to be less effective than commonly thought, due to limited incentives and capacity by the recipients to comply, and by donors to impose sanctions' (Kaimowitz 1998). Next, he suggests that 'investment projects require intensive management and process-based approaches…which partially conflicts with the large size and limited supervision of most World Bank projects' and asks to 'give higher priority to project implementation'.

Overall, SAPs target trends and factors which hinder SFM. SAPs should have positive long term effects, but do not always have. It should be noted, hower, that one possible reason for insufficient performances of SAPs is their often partial application (World Bank).

2. Agricultural Trends

Agricultural activities are often referred to as one of the major causes of forest decline and unsustainable forest management (FAO, AFOCEL). Where agricultural development is favoured over forestry, sustainable forest management seems difficult to implement. This is especially important in the context of demographic changes and when land tenure rights are unsecure. Indeed, numerous authors have made this point, such as van Soest, Contreras, Saxena (1988) for India, and Southgate et al.(1989) for Ecuador.

The overall policy framework is also important for the impact of agricultural trends and policies on trade and SFM. According to FAO (XYZ), 'policies which seek to improve the terms of trade for agriculture, such as currency devaluations, trade liberalisation, reductions in agricultural export taxes, agricultural price subsidies, and reduced fiscal spending on non-agricultural sectors tend to raise prices received by farmers, and hence increase deforestation'.

Relative prices and the elasticity of food demand are also of relevance, as are the conditions under which agricultural production takes place (intensification or extensification, population pressure or traditional resource use, other sources of income such as mining sector).

Kaimowitz and Angelsen (1998) explain why increasing agricultural yield does not have an unambiguous effect on the amount of forest land. Indeed, they show that the exact effect depends on the relative elasticity of demand and supply: 'technological change will tend to reduce cultivated area and pressure on forests when… they significantly increase agricultural yields and get adpoted by large number of producers...and when consumers do not buy a lot more food. In contrast, technologies adopted by only a small number of farmers…or which have little impact on yields…are more likely to increase deforestation'.

Also, the authors argue that labor intensive technologies ar less likely to induce deforestation than other technologies and that it is important to take alternative land uses (other than agriculture and forest) into account. Finally, they state that 'government macroeconomic, trade, financial, agricultural and infrastructure policies have a strong impact on what technologies get adopted and on the prices and resource constraints producers face.' Kaimowitz and Angelsen (1998).

What is more, the *kind* of agricultural land use is important when comparing the influence of economic development on forest trade an management. Van Soest, has analysed the stability of shifting cultivation in Cameroon and the reasons why they may or may not be compatible with sustainable forest management. He notes that 'shifting cultivation can be a sustainable forest management system . (see also *Sethi, Somanathan, Ostrom, Dasgupta and Mäler 1994 and others*). But he then shows that shifting cultivation has been negatively affected by the economic crisis: 'increased population pressure, higher percentages of short-term contracts and increasing insecurity of land rights induce peasant households to cultivate their land more intensively by increasing the cultivation period' (van Soest, 1998).

Contreras-Hermosilla shows the influence of the economic situation on forest management through the development of large-scale agriculture. Especially in Latin-America, 'the latifundia-minifundia complex'…triggers unemployment problems and greater population pressure on forest lands, which is channeled by the government : according to Contreras-Hermosilla 'voluntary or forced resettlement programmes have resulted in large areas of forest being cleared for subsistence agriculture.' Similar developments have lead to unsustainable forest management in large parts of Asian forests. Thus, paralell rural development programms are key to the positive impact of an increase in agricultural productivity.

Wunder (2000) points out an interesting relationship between the import-competing food crop sector and forest management. Between 1960 and nowadays, Gabon's food crop sector has shrunk considerably. Following Zomo Yebe (1993: 79-84) Wunder underlines that 'high salaries, high transport costs and the elevated costs of deforestation' are the three main elements that impede the needed expansion of this agricultural sector. Likewise, the deacreasing importance of the export crop sector of cocoa and coffee in Gabon implies, according to Wunder (2000), 'that the two crops at present do not exercise pressure on forests'. However, he also underlines that this is particularly linked to the overall economic situation in Gabon: 'had it not been for the impact of massive oil rents, the Woleu-Ntem province (in the North of Gabon) would likely have embarked on land-use trends comparable to the ones in the adjacent Humid Forest Zone of southern Cameroon' (Wunder 2000).

With respect to the impacts of agriculture on trade in forest products, van Soest argues that 'demand-reducing trade policy measures…are only effective if there are no alternative types of land use for the forest regions, and if there are no short-run considerations that necessitate forest exploitation'. Next, he warns for unconditional use of discriminative trade measures 'as the introduction of a certification regime may, on the one hand, decrease cumulative deforestation, but, on the other hand give incentives for the local govenments to increase the *rate* (of conversion of forestland to agricultureal use) because of the resulting market segmentation'.

Overall, the impact of an increase in agricultural productivity on trade is unclear, whereas the impact on SFM turns out to be rather negative in the short run, but positive in the long.

3. Energy and Mining

The mining sector can have great or small direct impact on forest decline according to the area and the mining technology applied, but it always plays an important indirect role (see Kaimowitz 1998). This is also true for its influence on forest product trade, as it impacts on infrastructure and employment opportunities.

An oil or mining boom creates rent opportunities which may or may not be used for SFM. Imports will increase, and depending on the nature of imports, the impacts on SFM will be different. If more food products are imported, the domestic food crop market will shrink and marginal farmers are likely to move to urban areas, which decreases pressure on forest land. On the other hand, if more other consumption goods are imported, the impact on the agricutural and forest sectors are less clear.

Wunder(2000) for example analyses the influence of the mining sector through oil cycles and macroeconomic changes. He notes that the expansion of oil exports has lead to a marked decrease in timber export: Wunder (2000): 'In 1960, timber made up almost three fourths of Gabon's exports, but with the expansion of oil exports, this share was reduced to less than 10% by 1980 (Pourtier 1989: 191)'.This has had important impacts on land use change in forest areas: 'The single most important transformation of Gabonese society during the last half-century has been the accelerated urbanisation of a forest people (Walter 2000).

Overall, if governance is optimal, rents may be invested in order to induce SFM and induce long term development. If governance is weak, rents may be directed to consumption, which may have negative effects on SFM, depending on the direct threats to the forest surface throught population growth and agricultural development.

4. Investments

Investments are a key element in the relationship extra-sectoral influences-trade-SFM. They have a very direct impact on trade, as they affect competitiveness or the accessibility of forests. Decreasing transportation costs, investments have the same impacts as currency devaluations. In the medium and long run, they may lead to a dramatic reduction of forest cover. On the other hand, certain investments are a prerequisite for sustainable forest management and indirectly help to access certain export markets, especially in Europe.

Substantial investments are necessary to switch from the current situation to improved forest management, chapter 11 of Agenda 21 (UNCED 1992) has estimated annuel funding needs at over US$31 billion. As Chipeta and Joshi (2001) state: 'these investments are beyond the reach of many developing countries', thus the international community and the private sector will have to play an important role. Key to the impact of investments on trade and SFM are the kind of investments that are implemented and the governance framework in which they take place. The following section will review these elements in more detail.

Sources of Funding and Risk Perception

Poor access to funding is one of the main reasons why sustainable forest management is difficult in tropical forestry countries. This is true for both, the export oriented industrial roundwood sector, except the pulp and paper part, and the more regional oriented sector of fuelwood and construction wood. Multinational companies migh have a comparative advantage as they are able to switch funds between subsidiaries.

Private investment in SFM plays a major role and has been increasing over the last years Chipeta and Joshi (2001). Worldwide, most private sector investment is in developed countires. According to Chipeta and Joshi (2001) 'an encouraging trend is the emergence of interest form large institutional investors, such as pension funds and insurance companies of industrialised countries, in forestlands as a safe investment vehicle; …which led to launching of professional investment funds, known as Timber Investment Management Organisations (TIMOs)'. Mertz and Moura-Costa et al. give evidence of such TIMOS, which are also increasingly present in developing countries, especially in South-America. Most private SFM investments concern plantations and the pulp and paper sector. According to Ivan Tomaselli (2001), 'some lessons can be learned form programs developed and implemented to support the expansion of forest plantations'.

Where internal sources are weak, international public funds and foreign direct investment play a critical role. However, there is a marked decline in official development assistance and public international public funds for SFM are smaller than announced in the Agenda 21 target (Joshi and Chipeta 2000, Crossely et al 1997). What is more, 'a majority of world total FDI inflows, about three quarters, is directed to developed countries' (Sauvant 2001 in Jon Bingen Sande 2002), most in form of cross-border M&As.

'Although FDI to developing countries has increased, the increase for (some regions, like) Africa, has been negligible.' (FOSA 2001). This despite the fact that average rates of return seem to be high – according to FOSA, 'US FDI in Africa averages rates of over 25%- and probably due to the high risks of investing in these countries.

Indeed, various risks hinder the access to funding: often, the country risk is high, due to war and conflict, but also to administrative and policy failures: 'Land tenure uncertainties, weak legal frameworks and mechanisms that hinder the development of free and fair markets constrain (further) the emergence of a strong formal private sector' (FOSA 2001, Kaimowitz 1998). These barriers are especially important in long-term investment projects, such as those in SFM. What is more, natural causes, such as fires, hurricans and deases which may destroy the resource.

The behaviour of the private sector can also be explained by these risks. Closely linked, the financial risk, as far as companies (not banks) have to bear it. Funding is scarce, whereas investment by the companies might be important, at least concerning infrastructure. Lacking access to finance and insurance systems is likely to increase, in turn, their short-term behaviour.

On the other hand, transparency in the private forest sector also often leaves to be desired and external funding for forest projects will not increase considerably as long as the transparency in the sector is weak. Indeed, experience has shown that financial or public institutions have been involved in money laudering (see Kaimowitz). Moreover, as stated in Landrot and Speed (2001) 'many large environmental organisations have never accepted the harvesting of primary forests, resulting in the internaional community's unwillingness to invest in forestry'.

According to Kaimowitz, the private bank's behaviour will become even more cautious in the future, as several initiatives from NGOs and the World Bank suggest. Kaimowitz (2001)

quotes a recent agreeing by several leading ‘not to lend money for projects that harm the environment in developing countries.’ Also, according to Kaimowitz, the European Commission suggests banks to be more careful about funding ‘put banks on notice that under existing money-laundering legislation they could be held liable for giving loans to companies involved in bribery, fraud and other practices often associated with illegal logging’. Another reason seems to be that ‘such activities are not only destroying many of the few remaining undisturbed forests, but are also costing governments billions of dollars in unpaid tax revenues and contributing to violent conflicts in places like Liberia, the Indonesian province of Aceh and the Democratic Republic of the Congo. (Kaimowitz 2001). According to Kaimowitz this is a sign of ‘a growing recognition that private lending is just as powerful a global force as trade and investment in reshaping people's lives and the way we treat our natural environment’.

As for the pulp and paper industry in Indonesia, access to private funds seemed to have been too easy in the past and particularly unconnected with an overall industrial development strategy. According to Kaimowitz ‘the loans fuelled massive growth in timber-processing industries, particularly pulp…Indonesia lost millions of hectares of rain forest, and wood processing industries now need three to four times more wood than the forests can sustainably produce.’

It is subject of discussion who is responsible for the introduction and financing of SFM measures. The private sector states that ‘SFM…concerns governments themselves …(as) owners of the forest…if private forstry companies resources are to be redirected and channelled towards SFM, methods of ‘compensating’ them for the costs incurred must be found’ (Landrot, Speed, 2001).

Yet, funding from public sources may have other disadvantages as they are not based on long-term comitments. At least in developing countries, projects are mostly implemented within a quite short time horizon (see also SAPs, Kaimowitz) and loans from bilateral development agencies are not often long-term loans (see Landrot and Speed, 2001). In developed countries, the situation is different: according to Brand (2001), here, ‘most institutional investors are willing to accept an investment term of a decade or more’.

Another point to be made is the importance of the informal sector. FOSA notes:’…the low capital and skill requirements make entry to and exit from the informal sector easy. However, this imposes limitations, especially on long term investment and technological improvement.’ (FOSA 2001). Competition between the formal and informal sector may further hamper investment in sustainable production methods in the formal sector.

In many developing countries SFM projects will remain in the short run, dependent on imports of financial and human capital as … ‘human skills and research capacity (in Africa) remain still low’ (see FOSA 2001). Also ‘organization of research and related education leave much to be desired.’ (Kowero et al. in FOSA 2001). This renders sustainable forest management even more expensive. It also means that, up to now, SFM is not necessarily supported by the local population, but rather a top-down initiative in order to meet certain consumer requirements in export markets.

Investments in Particular Sectors and Technologies

Despite the above mentioned difficulties, investments in particular sectors and technologies in support of SFM do exist. It is the private sector that is currently the major investor in SFM, worldwide (Chipeta and Joshi 2001). But given the large scale of the projects and the skills and technologies asked for, most of them are co-organised with international organisations, bilateral aid donors and NGOs. Landrot and Speed give various examples, among others the ITTO-CIB project on biodiversity management in Northern Congo, where the influence of fauna management and local community

cooperation on SFM is important. Of the total US$ 1.2 million project costs, US$ 410 000 was contributed by the CIB (Landrot and Speed 2001).

Investments which increase trade in forest *services* relate primarily to the establishment of conservation areas. The latter are set up in order to preserve certain species in flora and fauna, biodiversity in general, carbon sequestration areas or scenic beauty. (Famous examples exist in Costa Rica, Guyana or the US, among others). As stated above, the potential of such investments to induce SFM is big, but other extra-sectoral influences (such as population pressure or weak governement structure) have limited the success of these investments up to now.

Brand (2001) gives evidence of current examples of private sector investment in forestry for environmental services. The most famous international agreement in this matter is the Kyoto protocol. According to Brand, there remain still many problems: for the moment 'the current uncertainty over final Kyoto Protocol rules and the lack of a market value for carbon credits make it relatively difficult for investment managers'. Nevertheless, the work on this protocol has lead to a growing mouvement to create analogous environmental service markets. But again, the difference between developping and developed countries is important. According to Brand, Australia is a pioneering country in launching these new kind of environmental markets.

The establishment of carbon trading schemes may favour plantation establishment. Whether this increases or decreases the pressure on natural forests depends on various factors (see above). Solely the establishment of plantations does not enhance sustainable forest management, though the latter might be easier to implement in plantations than in natural forets.

Investments in the *communication and transport* sector are key to facilitating trade (see next section). If investments in these sectors are eased through external sources, the private sector will make substantial gains. Whether or not it will invest these savings in SFM is another important question.

Investment in *sector specific technology* may reduce costs, improve competitiveness, increase trade and boost the overall economy. Whether these investments improve or hinder SFM if they are spent in other sectors depends on their nature and extent (see above). Changes in the forest sector are likely to facilitate SFM, as they improve efficiency in some parts of the sector (especially plantations), and decrease the pressure on other parts: use of more species, smaller logs, better processing and harvesting technologies and higher productivity, especially in the plantation sector, (FOSA 2001). Biotechnology development is one example of such investments.

Information networks facilitate trade and render forest management more transparent. This might make the distinction between sustainably and unsustainably managed forest systems easier and also contribute to the functionning of certification schemes. The establishment of forest management plans for SFM is an important step towards transparency. In Africa, the establishment of such plans is underway, for example in Gabon, Congo or the Central African Republic (see Landrot and Speed 2001). However, the sole existance of such plans does not yet mean that forest management is 'sustainable'. Indeed, FMPs are a prerequisite for certification schemes, but not a sufficient element.

Also, information may indirectly facilitate the acces to external funding. The private sector does insist on this point: 'The solution to the problem of funding SFM lies in gathering more complete and liable information…' (Landrot, Speed 2001). As the introduction fo the PEFC has shown, the private sector can play a major role in giving access to certain information. Finally, information on eco-tourism can attract people and increase the return in the service sector.

Transport: road construction facilitate trade in forest products and services. The road system can affect production location and lead to new market chains. For example Wunder (2000) shows the influence of road construction in Gabon : 'In terms of Gabon's total timber exports, Asian destinations

in 1997 reached a share of 62% (Marchés Tropicaux 1998: 36). The completion of the Transgabonais railway in 1986 was a key enabling factor, by opening up new extraction areas in the interior at cheap transport costs'. Ecotourism may also be directly dependent on the raod network.

Landrot and Speed also point at the role of the transport system in the redirection of African tropical timber exports from Europe to Asia: '…in the past few years, increasing volumes of logs have been shipped to Asia (more than 50%in 1998) due to growing demand and a shortage of supply in this region. This chang ein export patterns is most striking in those countries closest to the coast and with the lowest trnsport costs, such as Gabon, Cameroon and Equatorial New Guinea' (Landrot and Speed 2001).

Clearly, roads contribute also more directly to the deforestation process, especially by facilitating access to remote areas. They '…may also alter economic values and increase the profitability of converting forest land to agriculture… push land values up and thus make land more attractive to illegal occupants…for example in Brasil'(Contreras-Hermosilla 2000). However, 'polices…in order to reduce their negative incentives for unsustainable practices do not necessarily imply a reduction in road building or considerable economic costs. Often, simple changes in the design of road systems would produce a noticeable impact'(Kaimowitz et al in Contreras-Hermosilla 2000).

In general, investment does not mean investment in sustainable management. It may raise *production capacities* and stimulate unsustainable production methods, mostly oriented at export earnings. Indonesia's pulp and paper industry is a famous example for this. Indeed, over the last 15 years, Indonesia has been heavily investing in the pulp and paper industry and become one of the biggest producers world wide (Barr 2001). According to Barr, this has lead to the deforestation of around 90 000ha of natrual forests. Large parts of the paper production are exported to industrialised countries, such as the United States, Japan or countries of the European Union. On the other hand, nearly 100% of all manufacturing facilites in the pulp and paper sector are imported (USDS), mostly from the same trading partners. Barr (2001) reports how international financing schemes have eased investments in production capacity which has lead to growing pressure on the natrual forest. Plantations do not deliver enough timber to allow for a sustainable production, whereas logging in natural forests is particularly cost-saving (Barr).

What is more, it is debateable whether investments in *infrastructure and social networks* is a (sufficient) contribution to sustainable forest management. The private sector plays an important role in this area: 'companies are often responsible for building and maintaining important infrastructure, such as roads and bridges, in addition to providing schools, hospitals and other services for staff…' (Landrot and Speed).

Logging in some areas of the world is highly selective, for example in Africa where companies commonly extract less than 10 m3 per hectare (Grainger, van Soest, Landrot and Speed). Apart from the negative indirect impacts that may arise, this kind of harvest is sustainable – at least with respect to biomass conservation (van Soest 1998). With respect to biodiversity conservation it is not; and with respect to rural development, its influence is ambiguous: on the one hand, it improves local infrastructure and creates employment (Landrot and Speed 2001), but on the other, it might hamper local development as rents go either to foreign countries or centralized government units, but are rarely reinjected into local entities. Indeed, as Chipeta and Johsi (2001) state, sustainable forest management is different form traditional sustained-yield timber production.

Industrial Development

FOSA states that'a distinctive feature of wood production in Africa is the small amount of value added and… wood processing'. Indeed, most of Africa's production is roundwood (546 million m 3 in 1999, see FOSA), the major part of it produced by a few countries in Central

and South Africa and only 12% of total roundwood production is industrial wood production. Asia, on the other hand, has increased it's market share of processed wood. This specialization has lead to comparative advantages which will be difficult to catch up by the African market.

FOSA states that plantations have been established in a number of African countries in order to boost the development of forest-based industries. But they also claim that 'the absence of industrial development has undermined the economic viability of plantations resulting in their poor management and outright neglect'. Trade does not seem to be an alternative for these industries, probably because of insufficient competitiveness with Asian suppliers. Also, FOSA argues that the market for short-rotation plantation species for the pulp and paper industry is saturated and that Africa might not have a comparative advantage in this sector. On the other hand, the hard-wood, especially teak market, could be promising. However, this will require substantial long-term investments (FOSA) as well as the establishment of sustained niche markets, with, in the best case, high demand for SFM forest products. Angelsen, van Soest, Kaimowitz and Bulte (2001) state that 'whether or not technological progress reduces deforestation depends on …the market conditions, … the type of technology involved, the extent to which farmers can substitute between factors, the way households balance work against leisure, whether the technology affects the intensive or extensive production systems…migration…how steep the demand and supply curves are

Overall, there are two closely interrelated policies to be implemented: facilitating access to finance (and thus decrease discount rates) *and* channel investments towards SFM, i.e. improve environmentally sound technologies and allow for more transparency and information. The latter, in turn, facilitates access to finance etc. Also, industrial development has to be connected to the overall development strategy of the country

5. Institutional Context

Liberalization

Many developing countries' economies have been liberalized. Most often, liberalization has enhanced investment in logging and related activities (FAO). Kaimowitz (1998)also notes that 'financial liberalization leads to less lending for agriculture and forestry.' According to him ' this probably constrains commercial agricultural expansion, but may also promote more land-extensive smallholder production systems and limit long-term forestry investment'.

Yet, there have been regional differences: In Africa, FOSA (2000) states that liberalization has provided new opportunities for trade, but has also had adverse impacts on local industries as'it is unlikely that the region can produce as cheaply as some Asian countries because of higher labour and transaction costs. Even high quality products of speciality markets are likely to be affected as competitors will tend to pursue the market niches.'

Likewise Kaimowitz notes: 'the environmental effects of liberalisation in the forest product sector will vary considerably according to location, policy environment and the types of forest involved.....Across-the-board trade agreements that reduce all trade barriers in a uniform fashion are almost certain to cause adverse effects in numerous specific situations (1999, page 15). Likewise, NRI (1998) suggests that 'The Uruguay Round generally reduced wood

product tariffs and the extent of tariff escalation was also reduced. But its impact on forest management is yet unclear…'.

Liberalisation is often cuppled with increasing private sector involvement. This can bring about important changes for the profitability of forest sector companies and directly influence their market and resource use strategies. Also, this has positive effects in terms of FDI (see investments). On the other hand, in the past, many companies have first and foremost been interested in immediate benefits and quick returns on investment (see investments). Whereas the first factor (investments) might have a positive influence on SFM, at least as long as they are heavy enough to justify long-term management of the forest resource, the second factor is likely to induce unsustainable behaviour, leading to quick mining of the resource.

Finally, regional and sub-regional economic integration might give local people better access to exterior markets, and trade will probably increase. This might threaten SFM if political commitment and enforcement of sustainable forest practices are not established.

Governance and Corruption

Weak overall government structure is most often expressed in *insufficient enforcement mechanisms* and *lack of control* resulting in *illegal activities*. Often *corruption* is a major reason for unefficient government intervention. Contreras-Hermosilla states that 'illegal use of forests is rampant in most forested countries'. 'Illegal and corrupt operations are likely to have an important effect on forest management (and trade) because they increase investment risks and thus reduce the propensity of investors to implement sustainable managment programmes' (Contreras-Hermosilla 2000). Among illegal activities count illegal logging, wrong assesments of toal production and bribary to obtain forest concession or logging quotas.

This has also important impacts on the export sector and trade. Indeed, 'the small size of the formal economy' (FOSA) might sustain corruption with respect to traded goods in the sense that political influence will be necessary to get access to international markets. This would flaw considerable the potential impact of the international community on sustainable forest management practices.

In many countries, illegal cuts are estimated to be at least as great as official production (Friends of the Earth), most of it destinated at the export sector. For example, Hariadi Kartodihardjo(1999) states that 'between 1977 and 1998 only around 51% of estimated real log production was reported by the Indonesian MoFEC. He then calculates the material loss over the same period as being US$1.3 billion per year approximately. Hariadi Kartodihardjo stresses that illegal activity goes often along with unsustainable management : 'if it were 'merely' that some production went unreported, while the volume of this production remained dependent on forest capabiltiy and forest protection was implemented propertly, forest destruction would not occur…Yet, according to date form the MoFEC (of Indonesia), by the end of 1998, around 16.6 million ha of the natural production forest …had been destroyed.

For Hariadi Kartodihardjo, the two main issues linked to unsustainable illegal forest management are linked to the governmental structure of the country in question ; he therefore asks : 'how do you dismantle these institutions that have arisen structurally and that continue to stiumlate the destruction of forest resources ? and Who is going to consider the economic condition of the more disadvantaged segments of the society when these 'illegal institutions' collpase,….because the natural forest resources have been exhausted ?' (Hariadi Kartodihardjo 1999). According to Contreras-Hermosilla one reaon why illegal operations are

frequent in tropical countries is that officials are poorly paid by the government, but have high discretionary power where timber values are high. As for Indonesia, Hariadi Kartodihardjo emphazises the conflict that remains between the central and regional government of Indonesia over authority, especially in countries whith high political instability.

Nevertheless, according to FOSA, changes are underway, for example in many African states: 'the most important changes to forestry include *decentralization and community participation*, private sector involvement and *efforts to resolve conflicts and wars*. ' (FOSA 2001)

Especially the last point has a direct impact on trade in two senses: first, resolution of conflicts leads to higher transparency and mining of resources becomes more difficult. Second, conflict solving leads to higher stability and might attract capital. Resolving conflicts seems, thus, is a necessary condition for trade.

As for decentralization and community participation, they might lead to better tenure rights and thus easier control of the resource, implying stabler management and better direction of governmental aid. If this is the case, their might be room for expansion of some of the local forest products on international markets. On the other hand, this supposes that financial flows reach the decentralized government bodies. Otherwise 'decentralization may not …lead to genuine transformation. Cash-strapped provincial and local governents have often resorted to over-exploitation of forest resources' (FOSA 2001). As for South America, Ivan Toaselli (2001), states that 'decentralisation policies adopted by many countries in the region are not working as expected for foests. Decentralisation in forests has created overlapping structures and legislation, increased bureaucracy tremendously and added new costs…(also for SFM)'.

Thus, corruption within the control bodies allows operators to bypass regulation, leads to increased informal activity and decreased fiscal revenues for the government. The impact on SFM is clearly negative.

Government Policies

The following section reviews the influence of particular policies. Repetto has undertaken the most famous study on subsidies which unintentionally cause forest decline. He states that …the effect of all such measures is to shift the margin of relative profitability between forest and the competing land use, encouring more forest conversion than would otherwise take place'(Repetto 1993).

Contreras Hermosilla gives an overview of governmental policies which can have adverse effects on sound forest management (Contreras-Hermosilla 2000) : 'subsidies affecting forest raw materials or other inputs, subsidies affecting competitive uses of lands, such as cattle ranching, plantation subsidies, price controls, subsidies affecting forest harvesting or manufacturing, forest product taxes, subsidised credit, foreign exchange policies affecting competitive uses of lands.' (Contreras-Hermosilla 2000).

Agricultural Policies

Also, Contreras-Hermosilla notes that 'Governments often grant direct or indirect subsidies to agriculture. This increases the profitability of agriculture and (in some cases)…the pressure to convert foreted lands (Contreras-Hermosilla 2000). Cosgrove-Sachs (WTO) argues in a similar way: 'continued protection and subsidies for farmers in specific markets result in depressed world markets for agricultural commodities, thus limiting the scope for investment in sustainable farming' (in: Franziska Hirsch 1999).

However, Contreras-Hermosilla highlights that 'Whether agricultural subsidies and the associated possibility to increase agricultural profitability will lead to either intensification or extensification depends on the technolgies adopted, the economic conditions facing farmers, the availabiltiy of different types of lands and the nature of subsidies.' (Contreras-Hermosilla 2000) Though, according to him (2000) 'often expansion into forested lands is a more profitable alternative.

'Even subsidies that lead to the intensification of agriculture may indirectly provoke forest decline. For example, Southgate (1992) notes that in Brazil, incentive policies encouraged land ownership concentration which …resulted in increased rural unemployment,…and some of the displaced workrs …migrated to the forested frontier in the Amazon'. Similarly, Contreras-Hermosilla notes that 'the introduction of mechanised soybean production led to major increases in forest clearing' in major parts of Latin-America (Angelsen and Kaimowitz 1998 in Contreras-Hermosilla 2000). According to Contreras-Hermosilla, agricultural subsidies have a particular negative effect on forest management when it is easier to substitute the use of labour by other inputs.

Wunder also point at the fact that government intervention is often uncontrolled and does not reach its objectif :agencies introduced to minor the influence of economic cycles, in this case price variations, if they do not function well, are an additional barrier to private sector development.

As for Gabon, Wunder (2000) points out that 'subsidised credits were a main instrument in channelling resources to agriculture'. He adds: 'Some crops, such as plantain, rice and cocoa, would indeed require forest clearing, but others (ranching, sugar cane) would draw mainly on savannah areas, while tree crops (rubber, oil palm) would imply the replacement of natural forest by tree-crop plantations'. And then: 'There are thus two fundamental reasons why the policy-induced emphasis on agro-industry did not cause any noteworthy deforestation. One was the capital- and land-intensive character of planned production, compared to traditional land-extensive agriculture. The second was the general failure to implement the strategy' (Walter 2000).

Trade Policies

Kaimowitz notes that 'reducing tariffs and trade restrictions for manufactured imports shifts the terms of trade in favor of agricuture and forestry and thus tends to have similar effects on forests as a devaluation.' On the other hand, 'lower agricultural export taxes encourages agricultural expansion' (Kaimowitz 1998). Also he notes that 'facilitating access to credit for beef cattle, mechanized agriculture, and large-scale forest and tree crop plantations in areas with substantial natural forests typically promotes forest conversion…'The same effect is reached by 'reducing poverty at the forest margin through imporved market access, technology and credit supply.' Also, according to Kaimowitz 'eliminating fertilizer subsidies' may lead to more land-extensive cropping systems and lead to greater forest clearing.

Wunder (2000) describes the role of export policies on the relative importance of different export sectors in Gabon : …'the situation since the 1970s has predominantly been the opposite: policy interventions in the sphere of trade and price controls mostly exposed private producers in the traded sectors further to competition from abroad, especially in agriculture…(which) reveals the low priority that this sector has had in government policy. But then he continues: 'The government continuously used protectionist measures for some larger processing industries, such as sugar, cement and bottled water (D.Young, pers.comm., US Embassy, Libreville, 2 June 2000). Yet, helping these parastatal industries to stay alive or to expand did generally not have any forest impact'. At first sight, this could be contradictory, as neither liberalisation nor protection of industries had an impact on forests. But Wunder explains his claim by the spatial distribution of the concerned industries: …' But sugar plantations were being established in the savannah areas of Franceville, and did thus cause savannah conversion but not deforestation' (Wunder 2000)

Labour Policies

Labour policies have a crucial impact on trade. As Mussa states: 'Economic globalization can happen in two primary ways : either you trade goods and services, or you shift the movable factors of production, labor and capital.' (Mussa, 2000):

Walter (2000) points at the influence of labour costs in Gabon:'Forest clearing in Gabon remains a highly labour-intensive activity which in 90% of rural households are carried out by axe and machete, while only 10% possess a saw (*ibid*: 67). High labour costs are an important impediment to projects involving manual forest clearing (Zomo Yebe 1993: 80, 83-4). Poverty alleviation thus raised the opportunity cost of rural labour, which *ceteris paribus* reduced forest conversion'… 'Unlike the case of Cameroon, people are seldom returning to the countryside as a response to rising urban unemployment. The gap between urban and rural remuneration probably remains too high'.

LandTenure Policies

Land tenure security is important to foster long term investments, reduce conflicts and regulate land access to outsiders. Short term effects are likely to be weak, but long term effects important. Especially respective rights of rural population and forest concessionaires might be clarified through land tenure security.

Management of the International Debt

According to FOSA (2001), 'the massive debts of the African countries will be one of the major factors to have an impact on forestry in the region. The total debt of African countries in 1999 was estiated at …(approximately) 60% of GDP'…Most of (the highly indebted countries') export income services these debts. With such high debts, the ability of most governments to invest in economic development is low'.

Contreras-Hermosilla (2000) gives an overview of the empirical evidence that has been found for the fact that 'the pressure to earn foreign exchange and repay debts may force governments to quickly exploit forest resources for export'. According to him, 'Kahn and McDonald (1995) concluded that debt service had a significant role in deforestation' after having analysed data for 68 countrie over 4 years. On the other hand, still according to Contreras-Hermosilla, Capistrano and Kiker (1995) came to the opposite conclusion using data for 45 countries and over 18 years.

Kaimowitz (1998) states that 'foreign debt affects real exchange rates and governments' capacity to carry out infrastructure investments.' According to him, 'some studies suggest high debt service ratios increase pressure on forest resources', but that 'the evidence remains weak'. Indeed, heavily indepted countries have fewer capacities to maintain infrastructure and forest expenditures tend to decrease.

The influence of the debt-payment on forest management might also depend on alternative land use choices available. Gabon is a curious example as 'Gabon has accumulated some of the highest foreign debt per capita in Africa, but because of a high income level total debt size corresponds to less than one years' GNP (95.7%) and the ratio of debt service to exports was only 13.1% in 1997 (EIU 1999: 30 in Wunder 2000). Indeed, Wunder underlines that 'the country used foreign capital to smooth the unpredictable fluctuations in international oil prices' (Wunder 2000).

As a conclusion we can state that, in the long run and in general, heavily indebted countries tend to increase the pressure on the forest resource, whereas the impact in the short run is mitigated.

6. Demography and Health

Population Growth

According to Gregory and Ingram (2000) 'the growth in human population over the past century has been closely associated with increased production of food and forest products (Dyson 1996)…Overall a population of about 6 billion is projected to raise to about 8 billion by about 2025 with most of the increase in the less developed countries in Africa and Asia' (Fischer Heiling 1997).

Numerous authors have studied the influence of population growth on deforestation, and many of them find a negative relationship, for instance Allen and Barnes (1985), Burgess (1992), Deacon (1994), Southgate (1994) or Ekbom and Bojö (1999). Specific country studies have also been conducted by Kummer and Sham (1994) for the Philippines, Panayotou and Sungsuwan (1994) for Tahiland, Reis and Guzman (1994) for Brazil and Southgate, Sierra and Brown (1991) for Ecuador, van Soest for Cameroon (1998), among others. Various authors note, however, that the *way* forests are used depend on several other variables, mostly socio-economic variables , such as per capita revenue, unemployment, agricultural productivity, or access to infrastructure (Van Soest 1998 , Contreras-Hermosilla 2000).

Clearly, population growth is one factor which has an important direct impact on the forest sector and forest product management through both, *higher pressure on land* and *increasing demand* for agricultural and forest products (construction timber, fuelwood).

As for the influence of population growth on trade, it seems that it might have an important influence on supply and demand for forest products, both concerning the amount of products asked for and the type of products. Combined with urbanization, population growth might lead to the creation of huge market chains in small spatial areas which could render trade more competitive and efficient.

Population growth leads to growing demand. But this does not always lead to unsustainable forest exploitation, depending on the import structure and the plantation policy. First, Wunder (2000) argues 'that demand structure in Gabon indeed changed dramatically, but that this had unimportant impacts on land use because food imports grew spectacularly.' Also, trees outside forests, will increasingly be used to meet the demand of the local population (FOSA 2001):'This is particularly the case of home gardens in the humid zone countries like Rwanda, Burundi, Uganda and several of West African countries'. However, one of the conditions for wider spread plantations of trees outside forests are secure land tenure.

Finally, demand for wildlife is one of the main driving forces of ecotourism, the major forest product service of tropical forest countries. However, the efficiency of the management of protected areas seems still insufficient. According to FOSA, 'problems like encroachment, logging, collection of fouelwood and other products' are not rare despite an increasing number of community-based management schemes. Political instability and unsolved land-tenure rights might be impeding factors. What is more, investment in the sector seems to be very low. According to FOA, 'a study by the WCMC shows that Africa's investment in park management is the lowest in the world'.

Health

HIV is an important long run factor influencing SFM. Any long term development might be hampered by the problems caused by HIV. On the other hand, SFM might be an instrument to prevent further spreading of the desease.

Policy Recommandations

General policy recommendations are difficult to formulate if one would like to avoid obvious ones, such as 'improve governance'. As it has been shown most extra sectoral factors might have a foreseeable impact on trade, but this impact is hardly translatable into a likely impact on SFM. Indeed, the trade – SFM relationship is highly context-depending. Trade expansion of wood forest products can be good for SFM only if an appropriate regulation system is enforced. If the objective were merely "avoiding deforestation", several recommendations could be formulated (i.e. less transportation infrastructure in forested areas, no subsidy for fuel in rural areas….) with a likely impact on forest margins and secondary forests. But as SFM is at stake, and considering our "Kuznet-curve hypothesis", one should consider differently what happens at forest margins and what happens within the concessions or community forests. If SFM has to be financially viable, outputs (wood, NTFPs, etc.) should be traded and this implies markets and transportation networks. Thus, there can be trade-offs between economic viability of SFM within concessions and deforestation at forest margins.

Nevertheless, we can evaluate the impact of some extra-sectoral factors on SFM:

- Clearly positive impact:
  - Land tenure security
  - Institutional stability
  - Good governance
  - Demographic transition achieved
  - HIV/AIDS low prevalence ratio

- Clearly negative impacts (in addition to the opposite of ESF above):
  - Agricultural intensification through mechanization in agricultural frontiers (forest margins)
  - Directed settlements in forest areas
  - Improving access to credit for beef cattle, mechanized agriculture, and large-scale forest and tree crop plantations in areas with substantial natural forests
  - Energy and mining projects in forested areas

Governments are – at least formally – committed towards governance improvement. On the other hand, land tenure security seems not to be a priority in several producers countries (i.e. Central Africa, some South-East Asia countries such as Indonesia). They can do few on factors such as demographic transition.

What governments can do is acquiring or reinforcing impact analysis, especially when they deal with agricultural development. Agricultural projects and policies conducted in developing countries are rarely assessed with regard to their likely impact on deforestation, on one hand, and SFM, on the other hand. There are "best practices" that can be used as substitute for several "lose-lose" agricultural projects (as direct settlements in forested areas that are in most case unsuccessful in the medium term), such as small-scale irrigation and labor-intensive agriculture in regions with substantial migration to the agricultural frontier (Kaimowitz and Angelsen, 2003).

Energy and mining projects in forested areas are much more difficult to discourage, as the financial attraction is generally extremely high for governments ("win-lose" situation). There, donors – if they are influential – can demand environmental impact assessments before any implementation decision. Oil/mine boom impacts are, as shown, context-depending. But in any case, the "Norway example" of forming a "next generation fund" where part of the rent is reinvested in financial assets and used for environmental and/or social investments, would be positive for SFM as it smoothes the relative price changes, prevents the generalization of "rent seeking" behavior and allows for adaptation processes.

Government and donors should develop and use adequate guidelines for assessing the impact of transportation investments on forest conversion and forest degradation. These could include the use of spatial models to estimate the probable forest loss resulting from improved access. Alternative routes and transportation methods (especially railways) should be fully considered. Railroad building and utilization is known to be less detrimental to forest cover than road network ("centralized" network railway system *vs* decentralized network of roads) but allows forest products to enter into trade, which in turn may allow for financial viability of SFM in concession (or community forests).

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Extra- sectoral	Likely impact	Impact on trade	Impact on SFM	Comment	Reference
Local currency devaluation	Increase perimeter of forest harvesting profitability (no change in FOB prices, drop of production costs) Farmers relying on cash crops becoming better off. Likely increase in cash crops areas.	Boost wood export Boost cash crops exports	Not straightforward. If no joint measures: *over-cut of export spots proximate logging areas with re-entry *enlargement of the range of species currently harvested (can be either positive or negative) *if cash crops compete with forestry on land-use side,	Need joint measures such as increase minimum diameter of cut, strictly enforced moratorium in degraded forest close to the export spots. Positive impacts more likely in high-grading contexts (i.e. Central Africa) and generally negative when harvests are of higher intensity (i.e. dipterocarps forest of South-East Asia) In the short term, cash crops area extension is detrimental for SFM, but better profitability can create room for intensification	W. Hyde A. Karsenty D. Reed?
Corruption within control bodies	*Allows operators to bypass log export ban or log export quota, to export banned or export-restricted species. *Decrease fiscal revenues (under-valuation of wood export)	Boost illegal wood trade	Clearly negative: *(more) Species illegally harvested *illegal logging		A. Contreras-Hermosilla
Increase of agricultural productivity	Impacts are not straightforward, depending upon several factors such as land tenure arrangements, demographic changes, rate of urbanization and rural-urban migration flows, relative prices, elasticity for food demand. Under some conditions, need less land to produce more food goods.	Unclear	Generally considered as positive, but not really straightforward as productivity is often driven by technological progress adoption, that might have contrasted impacts on forest cover – at least on the short term – with more incentive to clear forest land	Typically a factor that should be considered differently from short and longer term. On the long term, if significant forest cover should remain in developing countries, agricultural productivity should had increased. But on the short term, impacts can be opposite.	D. Kaimowitz, A. Angelsen
Oil/Mines boom	In developing countries (case 1) and low population, create rent opportunities in urban areas, increase public	Likely to increase exports of wood products (case 1). Can also hamper production (case 2), thus	In case 1, the impact is generally positive (less pressure on forest cover, domestic outlets for processed	The “rent problem” is closely linked to governance prevailing. In countries well governed such as Norway, oil rent is invested in various	S. Wunder W. Sunderlin at al. (CIFOR)

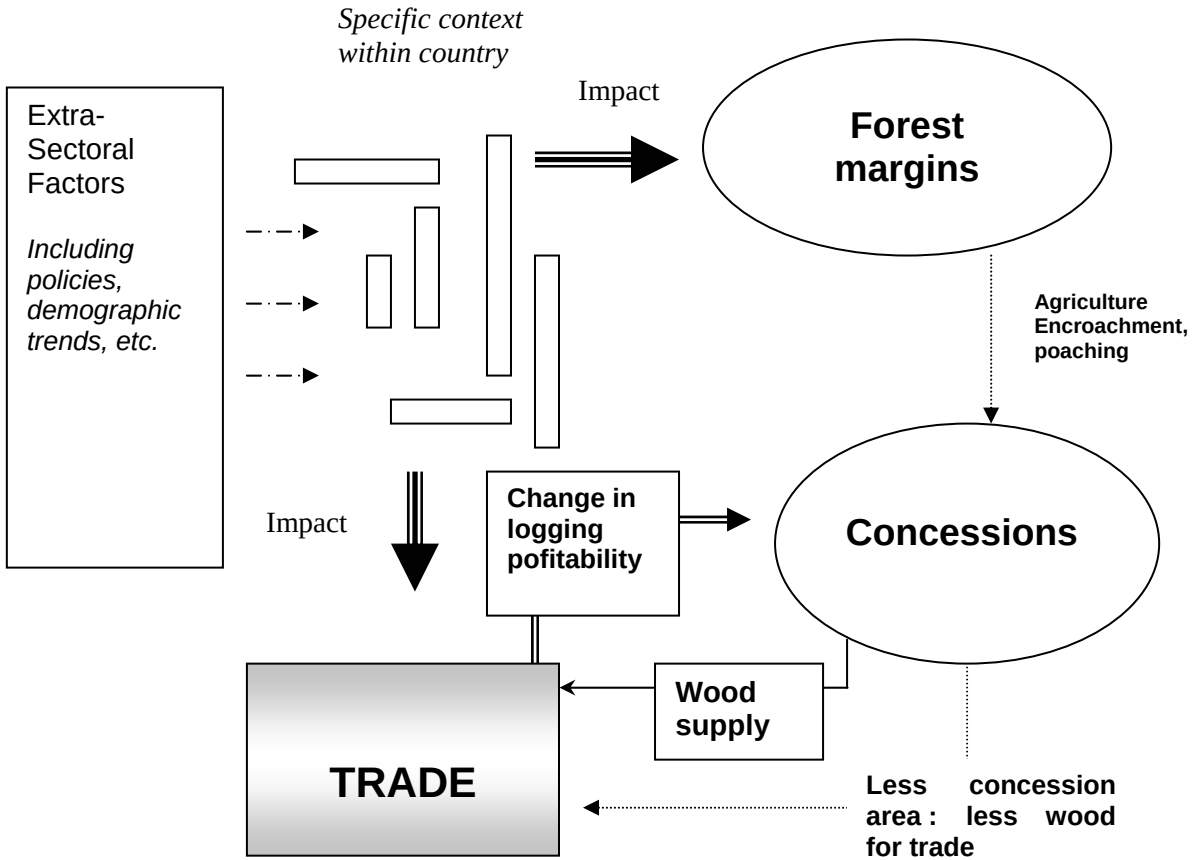
	wages, increase imports of food products which entails drop in domestic food crops market. Marginal farmers are likely to give up and move into urban areas. Marginal lands are abandoned. In populated countries (case 2), rent distribution and significant domestic market can create cash crops development opportunities detrimental to forest cover, or infrastructures building throughout the country.	decrease export potential Increase imports of wooden furniture and processed products.	products thanks to higher wages). In case 2, impacts are less predictable. The impact of higher wages in the forest sector is not straightforward: higher costs might hamper better management practices adoption, but on the other hand is an incentive to waste reduction and higher efficiency in all the forest operations.	assets and can fund environmental projects/measures. If governance is not satisfying, rent derived from natural resources such as oil, might impact positively forest management impact on the short term, but collective behaviour generated by “rent addiction” have also adverse effects on environment management on the long term.	
Infrastructure building/development	Harbour and road construction, railway rehabilitation or building are public investment lowering (private) transportation costs. It also favours population mobility, inter and infra-countries migration, development of bush meat markets, forest colonization by farmers, etc.	Decrease of transportation costs has the same impact as devaluation: wood exports become more profitable. In the medium-long term, infrastructure development may lead to dramatic reduction of forest cover, then less wood exports	Same as currency devaluation Bush meat domestic trade is favoured by roads development and rehabilitation, then impacts negatively FM. Specific investments may be beneficial for SFM, but access to finance is difficult, mainly because of lacking transparency in the sector and high risks.	As infrastructure construction cannot be separate fro country economic growth itself, it refer to the wider debate SFM / development.	ATIBT & IUCN
Structural Adjustment Program (SAP)	Decrease public expenditures in some areas, likely to reduce employment in public administration and sector. Lead to structural reforms in various ways	Unclear. It is sometimes argued that SA leads countries to increase their exports, but it is also suggested that companies taxes increase to balance State budget, that is likely to	SA had have numerous impacts in various ways: reduction of public employment, removal of subsidies for fertilizers, etc. Impacts of all of these factors are highly	Overall impact of SA programmes on wood trade and SFM are not straightforward on the short term. On the long term, numerous reforms with potentially positive aspects (transparency and governance) for SFM have been	D. Reed

		have opposite effect.	depending on the context. SA have lead to various reforms, sometimes also in forest sector (i.e. Cameroon, Indonesia). Impacts on SFM are sometimes highly debated.	implemented thanks to conditionality embodied with SA.	
External debt	Reduce public expenditures (including less infrastructures, etc.), focus public policies on debt reimbursement and foreign currencies obtaining. Exports are favoured. On the other hand, indebted governments tends to increase export taxes and get more foreign currencies.	Common sense argue that to reimburse debts, countries boost wood and other commodities exports. But there might have a gap between government wishes and what exporters can do, especially in export taxes raise and transportation infrastructures are not maintenance.	As a country is heavily indebted, infrastructures maintenance is declining and forest expenditures tends to decrease. Thus, impact is not clear in the short term and certainly negative in the long term.		
Demographic growth and migration and immigration	Increase pressure on forest resource, especially if land tenure arrangements do not allow easy settlement in agricultural areas. Very different impact in low-populated areas (i.e. Gabon) and in populated countries such as in South-East Asia.	Primarily, loss of forest impacts negatively wood forest exports. But more human resources means also more diversified production that benefits for domestic market demand, thus creates driving force for industry development and subsequent exports.	SFM is more difficult in a context of high demographic growth, as it causes land-tenure instability.	According to “Kuznet curve”, transition processes are creating difficult context for NRM, and especially forests.	
Land tenure security	Through titling or other procedures, land tenure security is supposed to foster long term investments in land, reduce conflicts and	No short term effects, but likely positive impacts in the long term as forest are better off.	FM should benefits from better property rights definition on agricultural lands and set up of mechanisms allowing migrants to	Land titling can provide more tenure security or create conflicts. What matters is effective security whatever the process.	

	regulate land access to outsiders		access agricultural land (through land renting and other land contracts) rather clearing public forest lands.		
Institutional instability	Create insecurity and short-term behaviours among economic agents	In the short term, might not affect wood products exports but change export make-up (more logs, lesser processed products)	No long term behaviour and investments. Clearly negative.		
HIV/AIDS expansion	Impacts both urban and rural population. In urban areas, both educated and regular workers are affected. In rural areas, it impacts industrial settlements (e.g. around wood processing industries) and transporters.	No direct impact on short term. As overall impact on SFM is negative, trade would be impacted also.	Very difficult to foresee in the short term: *on one hand, less labour capacities in rural/forested areas means reduced clearing capacities *on the other hand, intensification processes are likely to be hampered by less labour availability In the long term, social cost of the disease and destruction of human resource is negative for SFM	One can foresee in Central/West Africa companies policies to prevent and deliver medicine cure to HIV-positive employees, as it is already done in mine sector In Austral Africa. Such policies will have financial impact on forest companies, especially the industrial ones.	
MIXED FACTORS					
Relative prices wood/substitute (such as PVC)	Relative increase of wood price increase logging and wood processing profitability	Increase wood exports of a given country if local wood is competitive in terms of price and quality compare to other wood	Depends on the regulation system and it enforcement		
Overall fiscal policies impacting wood production costs	Increase in overall business taxation reduce forest economic rent (above "normal" profit) or even profit itself. If the measure is effective (no or non significant tax evasion), less efficient enterprises will	When transportation and production costs are high, implying high-grading: - rent decrease is not likely to impact trade in the short term - profit disappearance can lead to	Impacts are not fully predictable as companies are likely to react in different ways. *Some companies would react on long-term basis, investing in efficiency, going for management	Depends strongly of the initial level of fiscal pressure. Overtaxing has certainly more negative impacts on SFM than positive ones. Under taxing entails wastes and, generally, inefficient industrial path development. When mixed with policies	Hyde Repetto Gillis Vincent Pearce Karsenty Paris et al. Carret …

	tend to give up. On the other hand, less money will be available for SFM and best practices.	bypass the law and increase exports, or to amplify high-grading trends, reducing exports.	plans and certification to increase their added-value, other would give up financial efforts and investments toward SFM, reacting on short-term basis only.	such as log export ban, inefficient processing units are protected and often leads to overcapacities at country level But fine tuning (the "right" tax level) is hardly found.	
Better recognition of indigenous land rights	Might lead to community-owned forests or to another rent sharing, with more money for people	Might lead to less industrial logging, and possibly less wood exports	Not predictable: such a process can be dominated by rent-seeking behaviour and unregulated logging through sub-contracting extension, or can lead to sustainable local management.		Recent publications of CIFOR on Indonesia Recent suspension of community forest allocation in Cameroon

SKETCH of the Relationships between ESF, trade and SFM



Impact of ESF after influence of local or specific parameters

Negative impacts on forest cover and trade

Wood demand fuelled by trade improvement

Wood supply of trade by industrial concessions

Comments :

ESF have a direct impact on both, trade in forest products and forest management, and this according to specific local parameters (such as existing institutional arrangements, governance, law enforcement, population characteristics, food demand elasticity). ESF, especially if they are institutional, might have direct impacts on forest margins as well (deforestation), without triggering any direct change in forest products trade (e.g. land tenure security, structural adjustment program, migration, demographic growth; etc.).

What happens at forest margins might have an impact on concessions management, through agricultural encroachment and poaching. It could decrease the supply in sustainable wood/NTFPs entering trade.

Trade itself can change relative prices, thus change (relative) logging profitability , with an impact on concession management, which in turn will modify wood volumes entering trade.