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Background Research Paper

Environmental Impacts of Trade Liberalization in the Wood and Wood Products Sector of the Lao PDR

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To inform the *Rapid Trade and Environment Assessment* for Lao PDR, seven background papers covering nine key economic sectors were commissioned by the RTEA Expert Advisory Panel, a body consisting of key government and private sector stakeholders established to provide overall guidance to the assessment process. These papers provided vital background information and illuminated key sector-specific policy recommendations for the main assessment and are seen as a valuable contribution to the growing body of in-country research focusing on the complex dynamics between trade and the environment in Lao PDR.

This research exercise was coordinated by the Science, Technology and Environment Agency and IUCN – The World Conservation Union in Lao PDR.

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Environmental Impacts of Trade Liberalization in the Wood and Wood Products Sector, Lao PDR

by Sousath Sayakoummane and Vongxay Manivong*

Introduction

Wood and processed wood products play a significant role in the economy of the People's Democratic Republic Lao (Lao PDR). In the 1990s, wood and wood products accounted for 40 percent of export earnings, almost half of which was from the export of logs (CPI & UNDP 2006). During this period, the forestry sector grew faster than the rest of the economy, with an increase in log extraction from 300,000 m^3 in 1990 to 734,000 m^3 in 1998. Due to concerns about the low value of exports of raw logs and the depletion of the country's precious forest resources, the Government of Lao PDR (GoL) put a ban on the export of raw logs in 2001. As of 2004, the GoL ordered a reduction of the export of sawn wood, which reduced the annual harvest to approximately 150,000 m^3 in 2004/05, and subsequently increased it to 370,000 m^3 in 2005/06, with additional wood sourced from the Nam Theun 2 Dam (NT2) hydropower project area.

The GoL now strongly promotes downstream processing and export of finished or semi-finished wood products, which has led to the growth of the wood processing industry in Lao PDR. However, while there are some secondary wood processing factories, reform has been slow to date; Lao PDR's wood industry is still at an early stage of development, consisting mainly of small and medium-sized saw mills, plywood mills and other wood processing plants.

In 2004, manufactured wood product exports (mainly floor tiles, furniture, wood accessories, plywood and other processed timber products) accounted for US$6 million. However, the bulk of exports are wood or basic sawn and planked wood (despite the order to reduce), with not much value added (144.9 million in 2004). High-value exports such as furniture remain extremely low, between 1.7 - 3.2 percent (CPI & UNDP 2006) (for more detail see Annex 1). In addition, the *National Human Development Report* notes that the informal export of logs continues and in fact has been increasing in recent years (CPI & UNDP 2006).

Regional demand for wood is high. The main importers of Lao wood and wood products are Thailand, Vietnam, China and Japan. Significant demand is now coming from China, with imports of timber products to that country rising from 14 million to 45 million cubic metres in just 10 years (White et al. 2006). Annex 2 provides a more detailed summary on wood and processed wood exports to Thailand for the 2001-2004 period (MoIC & ITC 2006). It is clear that Lao PDR must continue to reduce the export of low-value wood products and work towards adding value to its domestic wood processing sector. To do so, understanding, integrating and increasing relationships with regional and international markets is vital.

Currently, many developing countries are involved in a large and increasing number of negotiations designed to integrate them into the international trading system. Lao PDR is an example of this trend; the country is in the process of World Trade Organization (WTO) accession and is involved in a host of bilateral negotiations. As a member of the Association of Southeast Asian Nations (ASEAN), Lao PDR is implementing the ASEAN Free Trade Area (AFTA) by 2008 and is involved in negotiations between ASEAN and China on a Free Trade Area (CAFTA) to be completed by 2010.

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The story of trade development in Lao PDR is an archetypal economic development scenario: a least developed country working to liberalize its economy, suffers from a worsening trade imbalance, external debt and growing account imbalance. At the same time, significant growth in exports is occurring – primarily through the extraction and sale of the country's natural resource wealth – specifically, Foreign Direct Investment (FDI) driven growth in the mining sector. Exports of cash crops, forest products and hydroelectricity are additional components of the highly-concentrated economic development now taking place in Lao PDR.

This paper examines the environmental impacts of trade liberalization in the wood and processed wood products sector, focusing on the wood processing industry and its supply of wood from natural and plantation forests. This paper is a contribution to the development of a Rapid Trade-Environmental Assessment tool. It also aims to define the strategic interest of Lao PDR in international negotiations and policy formulation with respect to trade and environment, which is based on extensive consultation and assessment of the domestic linkage between these two key elements.

Section 1:

Overview of the wood and wood products sector

1.1 Moving to higher value wood processing and exports

The GoL's *National Export Strategy 2006-2008* highlights the potential of the wood processing industry to grow and increase the value of exports from this sector (MoIC & ITC 2006). However, it also highlights many challenges, among them, issues with the supply of raw material, low access to finance, low skills in furniture-making and design, and a lack of technology to enhance the domestic wood processing industry and contribute to increasing value-added exports in the sector.

In 2001, there were 160 sawmills, two plywood mills and 1,269 small furniture manufactures in Lao PDR, most which were located in the central and southern provinces. The total estimated annual capacity was approximately 1.2 million m^3 of log inputs (Southavilay 2002). There are concerns that many of these businesses were operating inefficiently, producing sub-standard products and placing an additional burden on the country's forest resources through the illegal sourcing of timber. It is estimated that only 20 percent of the 1,269 small furniture factories in Lao PDR meet the GoL's standards and requirements for finished wood processing factories. As part of a recent effort by authorities, substandard factories in several provinces are being ordered to close or merge with others in an effort to increase efficiency (*Vientiane Times* 2007).

The GoL policy is to encourage the modernization and integration of wood processing industries in an effort to maximize operating capacity and conversion factors. However, despite heavy investment in the wood-processing sector, the GoL's efforts have not met expectations due to the intermittent supply of raw materials. The large-scale wood industry being attracted to Lao PDR is highly capital intensive and generates relatively little employment in the production of primary wood processing, for example in sawn wood and veneer.

1.2 Supplying the local wood-processing sector

In addition to challenges faced by the wood-processing sector to meet higher product value production requirements, there are also significant concerns regarding the supply of lumber to this sector. The installed capacity of the wood industries is currently very high, and far in excess of the Annual Allowable Cut (AAC). A risk associated with such a large processing capacity is that investors pressure the GoL and provincial authorities to secure more raw material supplies to operate their mills profitably, at the expense of the sustainable management of forest resources.

The annual logging volume is set by logging quotas issued by the Prime Minister, however since the implementation of the New Economic Mechanism in 1986, the provincial authorities also have the authority to issue logging permission for additional wood use, mainly for provincial revenue. This has added to the annual quotas and has made the system unclear. Also, there is a lack of a sustainable forest management plan (production forests), including unknown growth and yield data, and currently, timber and wood is sourced from unauthorized areas, including some from national protected areas and protection forests.

By 2020, it is estimated that domestic consumption of timber and plywood will increase to approximately 300,000 cubic metres per annum, assuming an equivalent per capita consumption. This is equivalent to round wood of approximately 600,000 cubic metres at 50 percent conversion. If the current level of sawn timber exports is maintained, total log removals of more than 1 million cubic metres will be required. Given probable sustainable log removals of approximately 300,000 cubic metres per annum, plantation wood will have to supply a large proportion of logs for both domestic consumption and export (MAF 2005).

1.3 Environmental concerns in the sector

The wood-processing sector in Lao PDR sources its raw material from either natural forests under a quota system or plantation forests. Therefore, key environmental concerns associated with the sector include:

- Deforestation;
- Loss of watershed protection; and
- Loss of biodiversity.

Lao PDR is particularly well endowed with valuable, productive and ecologically unique forests in comparison with neighbouring countries. However, this forest cover is declining at an increasingly rapid rate. A significant cause of this decline is logging, and the clearing of primary and secondary forests for plantations to supply the wood and wood products sector. An *Assessment of Forest Cover and Land Use during 1992-2002* (DoF & MAF 2005) indicates that in 1992 forests covered 47 percent of the country, with canopy density of 20 percent or more. However, by 2002, canopy density occupied only 41.5 percent, with quality on the decline. At this rate, the forest cover will be approaching 30 percent by 2020.

Forest decline is also associated with the loss of biodiversity (both species and ecosystems) and has negative effects on watersheds. This decline can impact heavily on local communities and local economies. There is growing concern over the adverse social and economic impacts of the decrease in forest cover, downward from 70 percent in 1940, particularly given that deforestation and forest degradation affects most severely the poorest segments of the population, who live in the forests and rely directly on forest resources for their livelihood improvement.

1.4 Policy and regulatory framework for the wood and wood products sector

In the past, the implementation and enforcement of laws and regulations dealing with forest management have been weak due to a lack of unity in perspective, awareness and implementation at the different levels of decision making..This is leading to the violation of forestry rules and regulations. Many local organizations (at the provincial and district levels) do not strictly comply with forestry regulations, especially those governing logging and export of wood, such as cutting/logging wood in excess of the approved quota or issuing permits for wood export without respecting the relevant regulations.

Forests, production forests and plantations are all regulated by the Ministry of Agriculture and Forestry (MAF). Until recently, wood-processing factories were also regulated primarily by MAF. However, following a revision of the *Forestry Law* and the *Processing Industry Law*, as endorsed by the *National Assembly* in 2005, wood-processing factories are now regulated by the Ministry of Industry and Commerce (MoIC). The key aspects of the GoL policy in this sector are:

- **Overarching policy**
  - The *National Socio-Economic Development Plan 2006-2010* calls for the harmonization of economic development with the protection of natural resources.
  - The Decision of the Prime Minister to endorse the outcome of the National Forestry Conference held on 01/03/2007 (25/PM) 2007.
  - The Order of the Prime Minister to enhance forest management and conservation, as well as to promote the production of finished products in the wood processing industry (31/PM) 2006.
- **Forest types (Production Forests and Village Forests)**
  - The *Forestry Strategy to the Year 2020* outlines strategies for production forests, tree plantation development, harvesting, logging, developing the wood processing industry and implementing sustainable management and conservation of forests, biodiversity and watersheds (MAF 2005).
  - Decree 59/PM/2002 provides for the establishment and management of large, contiguous tracts of production forests known as Production Forest Areas (PFAs).
  - The Forest Law of 1996 designates production forests, conservation forests and PFAs.
  - The Land and Forest Allocation Program allocated village forests.
  - The Forest Law Article 28 and MAF Regulation No. 535 on the Management of Village Forests sets out the participation of villages in forest harvesting, use and participation in commercial logging and other production forest management activities when a PFA exists within their boundaries (Phanthanousy & Sayakoummane 2005).
  - PM Orders No. 11/1999, 10/2000 and 15/2001 ban exports of logs and institute a reduction in sawn timber exports.
- **The wood processing industry**
  - PM Order No. 10/2000 and MAF Instruction Nº 267/2000 concerning the wood industry sector, including provisions related to:
    - producing semi-finished or finished products;
    - using high technology and high-productivity machinery that is appropriate for the production of semi-finished or finished products;
    - demonstrating superior environmental protection, safety and welfare;
    - operating with appropriate management; and
    - maintaining a good record of law abidance.
  - PM Order Nº 18/2002 concerning the closure of some sawmills and furniture companies.
  - PM Order Nº 18/2002 to promote the export of semi-finished and finished products and to ban log exports..The subsequent PM Order No 25/2004 allows the export of select semi-finished wood products.
  - PM Decree Nº 46/2001 bans foreign investment without joint venture arrangements into the secondary processing industry to protect domestic producers of semi-finished and finished products and to mitigate pressure on natural resources.
  - PM Decree Nºs 300 and 301 promote tree plantations for future timber supply.
  - PM Order Nº 18/2002 requires wood-processing factories to establish tree plantations.

Annex 4 provides a Matrix on trade and environment in the wood and wood processing sector.

Section 2:

Trade-related environmental impacts and national experiences in improving environmental sustainability in the sector

2.1 Analysis of the impacts of increased trade in wood and wood products

This report has already outlined the significant amount of wood and wood products that Lao PDR provides the region. As highlighted in the *National Human Development Report* (CPI & UNDP 2006) and the World Bank *Economic Monitor* (2006), while measures have been taken to ensure that more value from such exports is retained in-country, a number of issues such as illegal logging and timber exports (reducing supply for local businesses) and an underdeveloped, under-resourced local wood-processing industry are hampering this effort, and fuelling environmental issues such as forest decline, biodiversity loss and loss of watershed services.

Using the Rapid Trade and Environmental Assessment (RTEA) matrix, a tool developed for this assessment (see Table 3.1) (IISD & IUCN 2007), this section examines the impacts that trade liberalization for example in ASEAN, AFTA, AFTA-China and bilateral trade agreements could have on this sector, and in turn, on the natural environment in Lao PDR. Three categories are used in this analysis of trade effects and the environment, including:

- Scale effects: trade may lead to an increase in the scale of production of wood processing from natural and plantation forests;
- Structural effects: trade may lead to changes in the demand for wood and wood products and in turn the structure of the sector; and
- Technology effects (product effects): trade may lead to an increase in new investment that brings new technologies for wood processing with the increased yield or efficiency of wood-processing products. It may of course have the opposite effect, bringing old technology and outdated, less-productive processes.

2.1.1 Scale effects: Rising regional demand for processed and unprocessed wood products

Trade liberalization may lead to an increase in the scale of production in the Lao PDR wood-processing industry.

In the absence of trade, Lao PDR would presumably only produce enough forest products for domestic use; while under a trading scenario, it increases production of wood products for export, and in turn increases the contribution of the forestry sector to the national economy. In reality, Lao PDR is increasingly integrating into the trading system, and the rising demand for wood in the region, most notably from China, has the potential to scale up and speed up the current rate of forest decline.

Environmental concerns to consider with respect to scale effects are:

- Increased pressure on the natural forestry resource base as a result of increased logging to meet the demand for timber for wood processing, especially for certain key species.
- Decreasing biodiversity and pressure on specific forest species.
- Increased conversion of native forests to plantations to provide wood for the downstream wood processing industry.

Without appropriately-implemented environmental policies for plantation creation and wood processing, an increase in the scale of production in the sector could lead to accelerated harvesting of natural forests at unsustainable levels.

According to a survey conducted by MAF & NAFES (2005) of sawmills in four southern provinces where most large scale wood processing factories are located, only 13 of approximately 150 timber species are commonly used for processing. A rising demand for only certain commercial species as inputs to domestic wood processing factories will entail a shift in the composition of forests.. This has both negative and positive potential impacts. On the positive side, an increasing volume of currently non-commercially preferred species will be available for companies who can adapt their processes and are able to create market demand for new lesser known species. On the other hand, the changing stand composition in many forests will result in threats to, and changes in the structure and biodiversity of the Lao forests, including potential loss of wildlife and plant habitats.

Increased land for cultivation and plantation can means increased pressure on land use and conflict in converting both natural forests and agricultural land. The environmental impacts from large-scale plantations lead to impacts on land use for other sectors, such as land available for agriculture and food crops. This will also bring about changes in landscape and the composition of forest resources. These impacts include increased soil erosion and sedimentation from opening up large areas through unplanned and accelerated logging; changes in species composition and size structure; decreases in stocking densities of forest; and reductions in wildlife and plant populations, including non-timber forest products (NTFPs). When the forest cover is changed especially in the case of tropical forests, forest soil on steep slopes is particularly prone to degradation and erosion.

While plantations and their use in local wood processing have been promoted by government policy, concerns regarding their environment and social impacts are emerging. Recently, in response to these issues, the Prime Minister announced a moratorium on land concessions until policy in this area can be strengthened. The GoL has a window of opportunity now to look into innovative policy options that regulate and encourage appropriate land use planning and sustainable managed plantations.

In order to ensure a sustainable resource base for the wood and wood products sector, it is also essential for existing forests to be better managed. Currently, there are 59 PFAs in Lao PDR with a total area of 3.6 million hectares, among which eight PFAs have been officially established and have management plans; 29 PFAs have been agreed to by Provincial governors and are now under government consideration; and the remaining are currently being studied. Without a clear legal basis for boundary location and management planning, these forests are at risk of overexploitation and environmental degradation.

2.1.2 Structural effects: Changing from low-value to high-value exports

Trade that leads to changes in the demand for products and hence the structure of a sector to meet this demand is the most interesting effect to examine in the wood and wood products sector. Currently, Lao PDR is experiencing the negative impacts of illegal trade and low-value product exports, which is resulting in the depletion of forests for low economic gain. The issue here is that there is a demand for relatively unprocessed wood from Lao PDR to feed into the wood processing sectors in other countries (CPI & UNDP 2006). While this issue has been recognized by the GoL and leading companies in the sector, Lao PDR has yet to produce higher-value products on a significant scale.

One possible scenario is that during negotiations, Lao PDR ensures that trade agreements compliment existing National Government policy on wood and wood products. This in turn could facilitate the trade situation that the sector needs for the domestic production and export of higher value wood products, bringing benefits such as:

- Reducing import barriers to foreign markets (e.g., lowering tariffs under ASEAN);
- Facilitating transparent customs processes (e.g., the recent Vietnam/Lao PDR single customs check agreement);
- Increasing foreign investment (e.g., ASEAN Investment Area); and
- Constructing better, more-cost effective transport routes (e.g., GMS economic corridors and Thai/Lao friendship bridge agreements).

While trade-led expansion of the wood products sector has the potential to negatively impact the environment through increased scale (see above), it also has the potential to bring many positive effects. If wood resources, currently exported as low-value (e.g., sawn wood) to countries such as Thailand, Vietnam, China and Japan are instead channelled into the domestic wood processing industry, there may be no significant additional burden placed on the country's forest resources. In fact, under this situation, forest resources may benefit, as the domestic industry becomes more reliant on wood resources and more likely to assist in efforts to stop illegal logging and trade. Government revenue from the sector would be increased under this scenario and could be directed back into policies and programmes, such as sustainable forest management plans and forest management agreements with industry to promote sustainability of the resource.

2.1.3 Technology effects: Advantages and disadvantages of Foreign Direct Investment

The final effect of trade on the environment that this paper considers is the technology effect. Trade liberalization has the potential to bring new investment and new technology from abroad. For example, Lao PDR as a member of ASEAN benefits from regional cooperation and agreements to strengthen its domestic investment and business climate through for example the ASEAN Investment Area, as well as private sector led initiatives, such as the ASEAN Chamber of Commerce. As integration into ASEAN is strengthened, it is envisaged that regional investment will increase.

New investment and technology can have both positive and negative impacts on the environment. Lao PDR may attract foreign investors that bring technology that increases the yield or efficiency of wood-processing products (in terms of quality) and in turn leads to a reduced demand for raw materials from natural forests. It may also attract companies that bring with them high management standards such as supply chain polices which incorporate environmental concerns (e.g., to ensure timber is harvested from sustainably managed forests and obtains sustainable forest certification). However, at the same time, FDI can attract companies that are looking to take advantage of low standards or a weak policy environment which allows them to bring cheap, outdated and environmentally unfriendly technology and perform their operations in ways that their home country does not allow.

Developing effective policy to promote positive investment is a complex endeavour, requiring a careful balance of objectives and priorities. The GoL is currently undertaking a reform of the wood processing sector. Low value addition and inefficient factories are being ordered to close down or merge to become more competitive enterprises (*Vientiane Times* 2007) and factories are being asked to adopt better technology to add value to their operations. To this end, the government is promoting foreign investment in the wood processing sector. Through the Law on the *Promotion of Foreign Investment,* the government provides support to Lao industry and ensures the sustainability of Lao PDR's natural forests, by limiting foreign investment to ventures that source wood from plantation forests.

2.2 Case study of the wood and wood products sector: Certified forests

Trade has the potential to provide Lao PDR with the opportunity to improve the sustainability of the wood and wood products sector through responding to market demands abroad. Increasingly, companies across the globe are committed to supporting responsible forestry and sustainable forest management. An example is IKEA, the large Swedish multinational, which, through its purchasing policies, has a policy of sourcing wood and wood products (e.g., furniture) that can be certified as sustainably managed (IKEA 2007).

Sustainable production of timber has been a major policy objective of the GoL since 1975 and MAF has taken a number of significant steps towards bringing the country's remaining natural forests under sustainable management. The GoL has initiated preparations to enable forest management certification in Lao PDR under internationally accepted criteria. As a result, criteria and indicators for sustainable forest management were developed in 1999 and 2000 through a one-year pilot Forest Certification project under the Forest Stewardship Council (FSC), an internationally accredited certification agency, in Savannakhet and Khammouane provinces. In 2003, two natural forests covering approximately 50,000 hectares in these provinces were FSC certified by SmartWood, an accredited certifier and programme of the Rainforest Alliance Tropical Forest Trust (see www.rainforest-alliance.org). The GoL plans to apply these experiences to other production forests throughout the country. These certified forests are jointly administrated and managed by a Sustainable Forest Management Group (SFMG) at the provincial and district levels using the village forest model as the basis of forest management; villages are given long-term rights to use forests under the condition that they form management plans with local authorities and implement these accordingly.

Certification serves to guarantee that wood products are from sustainably managed forests - with endorsed management plans and effective implementation structures - and thereby allows premium prices and/or higher sales. While certification remains a new and developing concept in Lao PDR, it provides one option for ensuring that the country's forest resources are sustainably managed. It also presents a good opportunity for local wood product manufacturers to source timber that can then be used to make higher-value premium products for sale on the international market.

This scenario may, however, not happen unless the wood processing industry responds to market requirements, and starts creating chain-of-custody (CoC) systems. Large parts of natural production forest areas are already under sustainable forest management, and a significant forest area is also certified under the Forest Stewardship Council certification scheme. Timber from these areas can only be marketed to export markets as certified since forest industry enterprises in Lao PDR have yet to obtain CoC verification. Currently, only a few enterprises are aware of the opportunities of developing CoC and certification. With appropriate mechanisms in place, Lao PDR has the potential to become a largest supplier of certified wood products in Southeast Asia. If properly designed, CoC systems can contribute to enhancing environmental protection and reducing unauthorized harvesting and trade in illegal timber.

Most important to note for the Lao PDR wood and wood products sector is that the demand for certified sustainable timber has gained significant momentum; this green 'niche' international market may soon become the only way in which wood products will be accepted in some countries.

Section 3:

Conclusions and strategic policy recommendations for the wood and wood products sector

3.1 Conclusions

Since the implementation of the New Economic Mechanism in 1986, decentralization replaced the traditional economic planning process and Lao PDR started to move toward an opened market economy. During this process, the GoL also has set its goal to eradicate poverty and graduate from the list of Least Developed Countries by 2020 (GoL 2004).

The wood processing industry is growing quickly. The total number of sawmills (160 in 2001) and wood processing factories (260 in 2001) is high compared to the supply capacity of raw materials, including log exports and log consumption (620,000 m^3 per year) (Sugimoto 2006). While the capacity of wood-processing factories is estimated to be high, up to 1,165,700 m^3 per year (RCFTC 2007), the efficiency of factories is low due to the prevalent use of old machinery, low technology with low recovery rates and low value-added products. Moreover, there is a lack of certification of processed wood products for exports.

The wood products sector in Lao PDR is currently in the process of significant development. In this context, trade liberalization creates the potential benefits of increasing value in the wood and wood products sector, potentially stimulating sustainable forest management and sustainable forest certification in order to increase efficiency in the sector. At the same time, the potential exists to enhance the capacity and skills of Lao producers to put in place international standards and requirements, and thereby increase the opportunity to access new markets.

To benefit from regional and international trade agreements, there is a need to further develop a wood-processing strategy in line with the *National Export Strategy* for Lao PDR (MoIC & ITC 2006). This strategy will necessarily include enhancing the competitiveness of the sector through increasing efficiency and quality control systems; setting up and implementing national standards; increasing value addition; and fostering diversification for processed wood products to meet international market requirements.

3.2 Strategic policy recommendations

The GoL's goal is to ensure a balance between the supply and demand of timber and reduce impacts on forest resources and the environment. To this end, wood processing factories need to be reformed with proper criteria and transparent procedures. Recommendations for the GoL are listed below:

- **Encourage value-addition to stimulate processing indusries and obtain greater economic returns while minimizing resource use, through:**
  - Continuing to reform the national wood processing sector;
  - developing proper criteria and procedures for wood-processing factories, publicizing and conducting necessary closures/mergers in a transparent manner;
  - continuing to implement the Prime Minister Orders banning investment in wood and NTFP processing based on natural raw material and foreign investment in natural forest concession to protect domestic producers of semi-finished and finished products, and to avoid pressure on natural resources; and.
  - in addition to regulatory measures, developing incentive schemes to encourage the local wood-processing industry to use wood from forest plantations and from sustainably-managed production forests.

- **Strengthen dual policies on plantations and production forests to ensure a sustainable supply of timber for the wood and wood products sector, through:**
  - completing the establishment of a nationwide sustainable management plan for each Production Forest Area (PFA) together with law enforcement;
  - continuing to support the formation of Village Forest Management models;
  - ensuring logging operations are based on scientifically-based annual harvesting quotas;
  - declaring the temporary closure of forest areas where heavy logging beyond supply capacity of forests has occurred. Permanent closure would apply to riparian or watershed areas;
  - promoting efforts to rehabilitate degraded areas inside and outside Production Forest Areas.
  - establishing clear land and forest land allocation and classification criteria throughout the country in order to prevent conversion of forest land to other land uses;
  - clarifying regulations, including agreed steps, procedures and approval to facilitate plantation investment; and
  - Improving data collection and monitoring and the implementation of forest management policies, also to encourage species diversification.

- **Promote the scaling up of forest management certification**
  - continuing to promote and scale-up forest management certification through the development of a network on forest and wood exports, based on sustainable forest management; and
  - Continue building awareness of forest of national C&I for sustainable production forest management, develop criteria and indicators for plantation forestry

- Build Awareness and develop CoC Verification in industry:
- Carry out awareness building campaigns and organise training to enterprises in forest certification, and CoC verification (see Annex 3)

- **Continue to improve law enforcement in the forestry sector, through:**
  - strengthening implementation of polices and regulations on illegal logging and illegal log exports;
  - cooperating with trading partners in Europe and in the region on law enforcement, good governance and trade;
  - cooperating with customs, police and special task forces in the region to control trade in illegal timber;
  - strengthening monitoring of logging outside authorized areas to discourage unauthorized logging; and
  - strictly implementing the ban on the export of raw logs in order to ensure that only processed wood products are exports, contributing to the objective of adding value to downstream processing industries in the sector; and
  - ensuring logging quotas are strictly approved based on harvesting plans and that harvesting does not take place without approved quota.

- **Promote cooperation mechanism between public and private sectors, including in forestry, plantations and wood processing, through:**
  - continuing to work with the Lao Wood Processing Association on quota allocation schemes;
  - creating private/public sector fora in order to better engage all actors on forestry, plantations and wood processing issues;
  - improving funding and incentive mechanisms for activities that promote sustainable management practices undertaken by the private sector; and
  - developing strategies for ensuring environmental concerns are incorporated into the private sector decision-making process.

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Annex 1: Value of Timber Exports (US$ millions as a percent of total exports, 2000-2004)

	2000		2001		2002		2003		2004	
	US$ (mill)	**%**	**US$ (mill)**	**%**	**US$ (mill)**	**%**	**US$ (mill)**	**%**	**US$ (mill)**	**%**
Timber Exports	70.1	18.1	106.8	26.6	114.3	28.4	128.4	25.7	144.9	24.7
Total Exports	387.9	100	401.8	100	402.6	100	500.2	100	586.6	100

Source: CPI & UNDP 2006.

Annex 2: Wood and Processed Wood Exports to Thailand

Lao PDR Exports of Wood and Wooden Articles to Thailand 2001-1004 (US$)					
	2001	**2002**	**2003**	**2004**	**2004 Share**
Fuel Wood	768,337	19,601	18,908	100,818	
Wood Charcoal	1,928	10,131	12,011	28,245	
Raw Logs	15,218,683	1,474,031	1,107,663	3,080,099	
Rail (tram) way Sleepers	61,228	59,258	22,253	1,185	
Wood sawn or chipped lengthwise	**50,230,112**	**71,950,059**	**73,955,863**	**61,311,098**	**74.45%**
Sheets for veneering and plywood	185,581	412,585	1,750,491	1,560,211	
Wood (including strips for parquet flooring) not assembled, shaped, whether or not planned	1,232,079	1,368,765	3,758,369	4,924,991	

Plywood, veneer, panels	813,663	852,409	3,369,489	11,170,973	
Furniture, prefabricated buildings	**36,033**	**55,400**	**114,500**	**170,180**	**0.21%**
TOTAL	**68,547,644**	**76,202,239**	**84,109,546**	**82,347,800**	

Source: MoIC & ITC 2006.

Annex 3: Possible steps to develop certification and chain-of-custody verification

- Carry out a survey of willingness of the enterprizes to obtain CoC or quality management systems;
- Carry out an initial review in the selected enterprizes that have shown interest in their operations including wood procurement, and established management procedures including record keeping. Based on this prepare an analysis and summary. Discuss with the industry on application for quality management system/CoC verification or and invite tenders from international verification organizations;
- Assist the selected enterprizes to create management systems which can be audited and/or CoC systems that can be verified;
- Provide financial support to the best performing enterprizes (criteria to be established) to cover the cost of CoC verification; and
- Promote and build capacity of the industry through the Wood Industry Association to improve the recovery rate in the industry as part of the environmental management in the sector.

Annex 4: Matrix on Trade and Environment in the Wood and Wood Processing Sector

Category	Driving Force	Pressure	Impacts	Mediating factors	examples
Scale effects	Increased foreign markets for wood and wood products	Increased scale of the processing of wood from natural forests and plantation forests	Increased logging and demand for timber for wood processing means high pressure on natural resources Increased land for cultivation and plantation means increased pressure on land use – conflict to convert both natural forests and agriculture land for plantations	Scientific-based assessments to determine quota systems (annual logging management plans – logging quotas) Encourage diversification of wood species Encourage use of wood from sustainably managed forest plantations	See case study of unsustainable harvesting/ quota system
Scale effects	Decreased export barriers – lower tariffs – reduced subsidies	Increased quality and quantity of wood products	Encouraged use of other tree species, including branches and other residues, and from plantation forests Expanded land for improved natural forests /production forests/ village forests	Develop a strategy for the entire cycle of wood processing to reduce unsustainable deforestation and to promote sustainable forest management Enhance capacity of the Lao Wood-Processing Association to negotiate increased market access for processing wood product exports	Preparation of national trade and export strategy
Technology effects	Increased foreign markets for wood and wood products	New investment brings new technologies for wood processing that increase yield or efficiency	Reduced consumption of raw material from natural forests, use of plantation forests in the future		Forest certification that can lead to sustainable forest management
Structural effects	Trade leading to expanded wood products for high productivity and less waste to meet standards and requirements in foreign markets	Local businesses require more wood	Increased demand for timber from: 1) natural forests; 2) plantation forests; or 3) Wood currently exported as low value (e.g., sawn wood) is channelled into the domestic industry	Need adequate timber regulations and implementation: – review existing system for adequate technology for wood processing; and - promote development of skills for wood processing	Improved technology will lead to more efficient processing and enable international standards and market requirements to be met