PAPERS

Challenges facing certification and eco-labelling of forest products in developing countries

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SUMMARY

Certification has been developed as an instrument for promoting sustainable forest management. Although the initial focus of certification was on tropical forests, it rapidly shifted to encompass all forest types. Ten years after the first certification schemes were developed, most (91.8 percent) of the 271 million hectares of forests that have been certified are located in Europe and North America. Only 13 percent of certified forests are located in developing countries and only 5 percent of the certified forests are located in the tropics. Among the reasons for this disparity are: weak market demand for certified products in global markets; wide gaps between existing management standards and certification requirements; weak implementation of national forest legislation, policies and programs in developing countries; insufficient capacity to implement sustainable forest management at the forest management unit level and to develop standards and delivery mechanisms; and the high direct and indirect costs of obtaining certification in developing countries. Despite these challenges and constraints, many developing countries remain interested in pursuing certification. Several promising developments have recently emerged that may give further encouragement to developing countries' efforts, including supportive codes of forestry practice, stepwise approaches to certification and increasing interest in forest certification and certified products in the Asia-Pacific region.

Keywords: forest certification, developing countries, sustainable forest management

Défis auxquels font face la certification et le label-écologique des produits de forêt dans les pays en voie de développement

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La certification a été développée comme instrument pour promouvoir la gestion durable des forêts. Le but principal de la certification était une application dans les forêts tropicales; mais il s'est rapidement étendu à tous les types de forêts. Dix ans après que les premiers projets de certification aient été développés, la plupart (91.8%) des 271 millions d'hectares de forêts ayant été certifiés sont localisés en Europe et en Amérique du Nord. 13% seulement des forêts certifiées se trouvent dans les pays en voie de développement, et 5% uniquement dans les tropiques. On trouve, parmi les raisons expliquant cette disparité, une faible demande de marché pour les produits certifiés dans les marchés globaux, des schismes importants entre les standards de gestion existants et les conditions d'octroi de la certification, une mise en pratique molle de la législation, des plans d'action et des programmes forestiers dans les pays en voie de développement; une capacité insuffisante de mettre en action la gestion durable des forêts au niveau de l'unité de gestion forestière, et de développer le standard des mécanismes de mise en marche, ainsi que le coût direct et indirect élevé de l'obtention de la certification pour les pays en voie de développement. Malgé ces contraintes et ces défis, plusieurs pays en voie de développement demeurent intéréssés par la route de la certification. Plusieurs développements prometteurs à même d'encourager plus en avant les efforts des pays en voie de développement ont récemment émergé, comme des codes de support de la pratique de foresterie, des approches graduelles à la certification, et un intérêt croissant pour la certification des forêts et des produits forestiers dans la région Asie-Pacifique.

Retos de la certificación y el etiquetado ecológico de los productos forestales en países en vías de desarrollo

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La certificación se ha desarrollado como un instrumento para promover el manejo sostenible del bosque. Si bien el objetivo inicial eran los bosques tropicales, éste se ha transformado rápidamente para abarcar todo tipo de bosques. Diez años luego de que los esquemas de certificación se desarrollaron, la mayoría (91.8 %) de las 271 millones de hectáreas de bosques que han sido certificadas se encuentran

en Europa y Norte América. Sólo el 13 % de los bosques certificados se encuentran en países en vías de desarrollo y sólo el 5 % de los bosques certificados están en zonas tropicales. Algunas de las razones de esta desigualdad son: la demanda escasa de productos certificados en mercados globales; las brechas amplias entre los estándares de manejo existentes y los requrimientos de certificación; la implementación débil de legislación nacional forestal; políticas y programas en países en vías de desarrollo; la falta de capacidad de implementación para implementar un manejo forestal sostenible al nivel del manejo de la unidad de manejo forestal y para desarrollar mecanismos estándares y de cumplimiento; y los costos altos directos e indirectos para obtener certificación en países en vías de desarrollo. A pesar de estos retos y limitaciones, muchos países en vías de desarrollo siguen interesados en conseguir la certificación. Varios desarrollos que prometen cambios han surgido recientemente lo cual puede alentar los esfuerzos de dichos países incluyendo códigos en el apoyo de la práctica forestal, pasos constantes hacia la certificación y el interés creciente en la certificación forestal y en productos certificados en el área del Asia Pacífica.

INTRODUCTION

Concerns about increasing loss of tropical forests led to the development of certification as an instrument for promoting sustainable forest management in the early 1990s. Certification provides a mechanism for independent validation of sustainability in markets where forest products are subject to consumer resistance on environmental grounds. Although the initial focus of certification was mainly tropical forests, processes have rapidly expanded to encompass all forest types. Certification is envisaged as a market-driven mechanism that promotes sustainable forest management in three main ways:

- by establishing standards for forest practices and management that guarantee a certain level of management performance;
- by enhancing marketing opportunities for products from sustainably managed forests; and
- by promoting public education about improved forest management, for both producers and consumers.

Despite heightened interest in forest certification over the years, the total area of certified forests presently stands at 271 million hectares (Table 1) which is 7 percent of the global forest area of 3 952 million hectares (FAO 2006), or about 20 percent of the total production forest area of 1 347 million hectares. And while proponents contend that certification is enhancing forest management throughout the world, it is clear that the main impacts have been on large-scale industrial and state-owned temperate and boreal forests, while the impacts on forests in developing countries have been far less significant (Nussbaum and Simula 2004). To a large extent, it can be argued that certification has had its greatest success in "preaching to the converted" – in saving forests in developed countries that were probably already saved – while the vast majority of tropical forests that were the original target for certification have remained outside the process.

The disparity between developed and developing countries appears to stem from five major constraints, viz.:

- insufficient demand for certified products in global markets;
- wide gaps between existing management standards and certification requirements;
- weak ability to formulate appropriate sector policies and ensure their effective implementation;
- insufficient capacity to develop national certification standards and certification procedures; and
- the high direct and indirect costs of obtaining certification in developing countries.

Despite these difficulties, many developing countries remain interested in promoting forest certification, to the extent that several have initiated their own national certification schemes. This paper examines the challenges facing developing countries in pursuing certification, as well as the factors motivating their continued interest. It concludes by discussing some promising opportunities for moving forward, including work currently being done in relation to codes of practice for forest harvesting, stepwise approaches to certification, group certification for smallholders and prospects for increasing demand for certified products.

THE STATE OF FOREST CERTIFICATION

In the years since certification was initially developed, two main international forest certification schemes have emerged: Forest Stewardship Council (FSC) certification and the Programme for the Endorsement of Forest Certification schemes (PEFC). Meanwhile, numerous national certification schemes have also emerged (e.g., Sustainable Forest Initiative, Malaysia Criteria & Indicators [MC&I], Lembaga Ekolabel Indonesia [LEI], etc.), or are in the process of being developed.

Globally, some 271 million hectares of forest had been certified as of January 2006 (Table 1). Combined, FSC (25.14 percent) and PEFC (68.69 percent) account for 93.8 percent of all certified forest area (Figure 1). The vast majority of certified forests are in the temperate and boreal regions of North America and Europe, which together account for 91.8 percent of the total (Figure 2). Developing countries account for just 13 percent of certified forests (Figure 3), while tropical forests – the original focus of certification – harbour just 4.7 percent (Figure 4). Tropical developing countries with the largest areas of certified forests include Brazil, Bolivia, Mexico and Guatemala. The vast majority of certified forest areas (both tropical and non-tropical) are industrial forests.

TABLE 1 *Certified forest areas (million ha.) under various certification schemes, January 2006.*

Continent	FSC[1)]	PEFC[2)]	Others[3)]	Total	% Share
Africa	1.7	0.0	0.0	1.7	0.6
Asia-Pacific	2.4	5.2	4.7	12.2	4.5
Europe	35.0	55.9	0.0	90.9	33.5
North America	22.5	123.6	12.0	158.0	58.3
South America	6.5	1.6	0.0	8.1	3.0
Total	68.1	186.1	16.7	271.0	100.0
Market share	25.14	68.69	6.17	100.00	
Tropical	8.0	0.0	4.7	12.8	4.7
Non-Tropical	60.1	186.1	12.0	258.2	95.3
Developed[4)]	37.6	186.0	12.0	235.6	86.9
Developing	30.5	0.0	4.7	35.2	13.1

[1)] FSC (2006a), FSC (2006b); [2)] PEFC (2006); [3)] Others in North America refers to the American Tree Farm System CEPI (2005); in Asia, it refers to the Malaysian Timber Certification Council MTCC (2006); 4) Definitions based on OECD – Development Assistance Committee, OECD (2005).

FIGURE 1 *Percentage certified area per certification scheme*

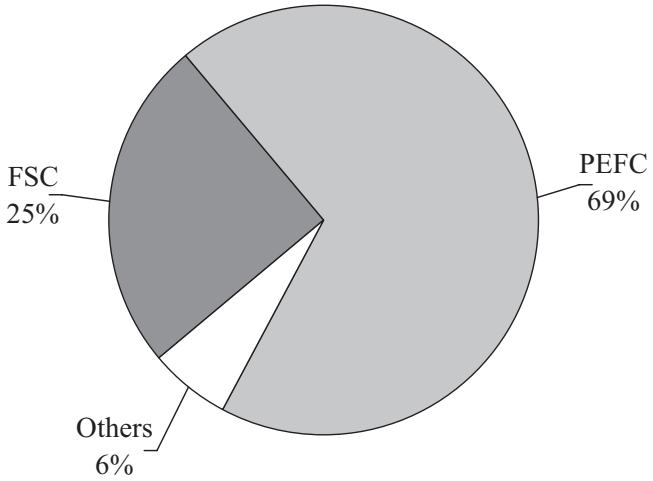


FIGURE 2 *Percentage certified area per region*

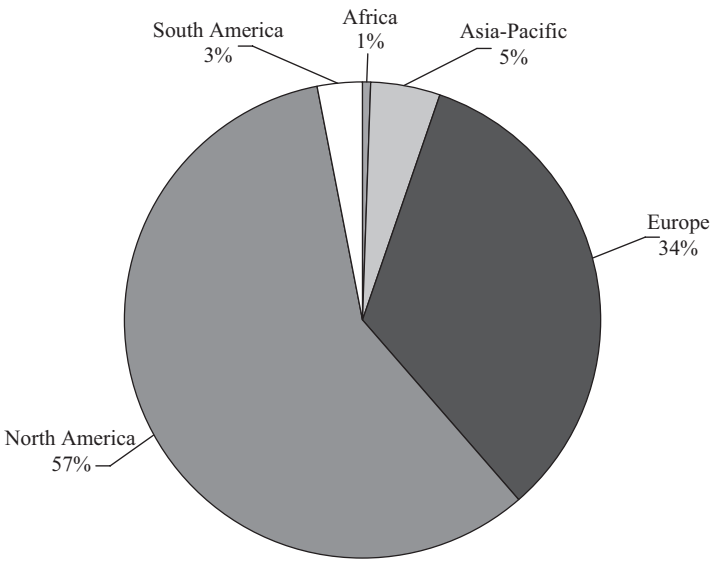


FIGURE 3 *Percentage certified area in developed and developing countries*

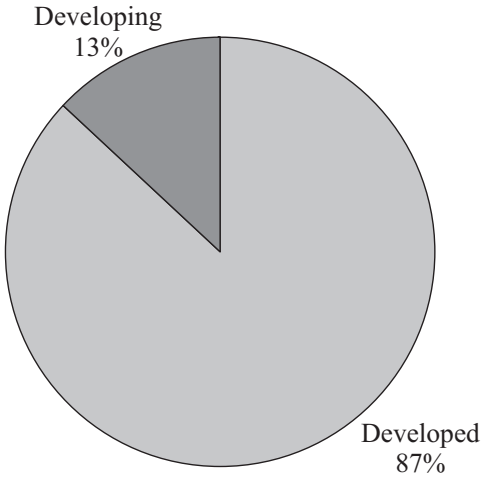
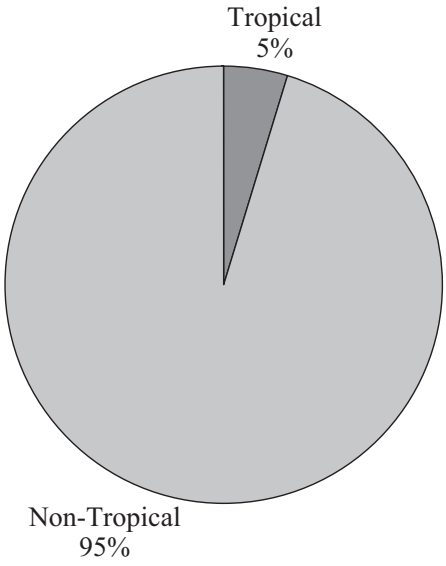


FIGURE 4 *Percentage certified area per tropical and non-tropical forest*



Only a small percentage of the potential annual supply of certified wood is actually traded as certified products (Poku-Marboah *et al*. 2005). Most certified timber is marketed without specific reference to the certification status of the product. This is largely due to the relatively small number of chain-of-custody certificates that have been awarded and a general lack of recognition and differentiation of certified wood products by private end-users.

CONSTRAINTS FACING DEVELOPING COUNTRIES

What are the principal causes of the disparity in the distribution in certified areas between developed and developing countries? One important factor certainly is that many developed countries have a longer track record of supporting and enforcing regulations that support sustainable forest management. Forest owners in many of these countries were already following the basic tenets of sustainable forest management practices, and were closely monitored by public authorities under their respective national forest laws, prior to the advent of certification and therefore have been in a better position to seek forest certification (i.e. the incremental steps required to obtain certification have been relatively few and easy to take).

The situation is very different in many developing countries. Although circumstances vary, the slow uptake of certification in many developing countries can be attributed to five main constraints.

Insufficient demand for certified products in global markets

North America and Europe currently offer the only markets for certified wood products. There is little or no local demand in developing producer countries at present, nor in the major importing countries of Asia.

Currently most demand for certified products is coming from businesses and government agencies wanting to pursue an appropriate environmental policy towards sustainability. Research indicates that there is very little recognition or demand from private end-consumers, who are generally unwilling to pay more for certified forest products (Anderson and Hansen 2004), except for certain niche products such as high-value furniture, musical instruments, etc.

Certification as a market-driven mechanism is made or broken by the willingness of consumers to purchase a certified product at a higher price than the equivalent uncertified product, or by access to markets that are unavailable to uncertified products. As there is currently no premium on certified products, there is little incentive for developing-country producers unless they sell to the North American or European markets.

To date, certified timber has failed to deliver the price premiums that many expected or hoped for. To a significant extent, this can perhaps be attributed to insufficient and ineffective marketing of certified wood products to final consumers. If certified products are to become more popular among the general public, then a greater emphasis will need to be placed on marketing among final consumers to effectively differentiate certified from non-certified timber.

Wide gap between existing management standards and certification requirements

In many developing countries there is a wide gap between the existing standard of management and what is required by certification schemes. This problem is exacerbated by the fact that there are often insufficient financial and human resources to effectively raise standards.

The shortages of high-quality trained forest managers are particularly acute in many developing countries. The staffing situation in the Democratic Republic of Congo illustrates the crisis of forest management capacity; the country has only 100 professional foresters to manage a forest area of 133.6 mill ha (FAO 2005), or an area corresponding to three times the size of France (FAO *et al*. 2003). Such shortages of skilled foresters manifest themselves at both the management level (where planning and decision-making continue to follow outmoded systems, or worse), and at the operational level (where there are not enough skilled workers to implement even the most rudimentary silvicultural practices). Under such circumstances, the prospects for attaining forest management standards suitable for certification seem remote indeed.

Another problem faced by many tropical developing countries is that the basic standards required for certification are often more difficult to achieve in tropical forests than in temperate forests. An example of this is related to biodiversity, which tends to be considerably more diverse in the tropics compared to temperate regions. There is often insufficient data available about the effects of forest management on this biodiversity, which compounds the challenges of achieving certification.

Weak ability to formulate appropriate forest sector policies and ensure their effective implementation

The weak ability to formulate appropriate forest sector policies and ensure their effective implementation is exacerbated by a host of related constraints, including:

- *Ineffective implementation of national forest legislation and policies*. While most developing countries have drafted forest policies and legislation that are adequately centred on the broad tenets of sustainable forest management, implementation continues to be a major weakness, due in part to lack of human and financial resources and inadequate political commitment.
- *Weak governance*. Many developing countries struggle with weak governance structures, under which corruption and illegal logging flourish. While corruption exists to some extent virtually everywhere, it is evident that the problem is most prevalent in developing countries. In general, weak governance enables the circumvention of sustainable forest

management principles and hampers certification efforts.

- *Inadequate forest law enforcement*. With relatively limited resources and few staff, forestry departments are often responsible for supervising and monitoring impossibly large and remote areas. This means that laws and policies are often inadequately enforced. With little chance of being caught or punished for violations, irresponsible forest operators have few incentives to voluntarily comply with management regulations, especially if doing so cuts into short-term profits.
- *Uncertain and/or disputed land tenure*. One of the critical requirements of certification is clearly defined tenure rights. In many developing countries, land and resource tenure rights are uncertain, disputed or held communally. Without legally enforceable ownership status and rights, forest users have little incentive to invest in managing and protecting forests or, particularly, to invest in forest certification.
- *Conflicting socio-economic and extra-sectoral policies*. Implementation of national forest programmes is impeded in many countries by conflicting socio-economic and extra-sectoral policies that conflict with sound forest management. The problem is especially challenging in developing countries where greater attention is commonly given to policies that yield the largest immediate boost to economic development – often at the expense of long-term social or environmental forest management interests. Thus, if the opportunity costs of "responsible forest management" become too large, people will logically shift land uses to more lucrative alternatives such as oil palm or cattle grazing.

INSUFFICIENT CAPACITY TO DEVELOP NATIONAL CERTIFICATION STANDARDS AND CERTIFICATION PROCEDURES

In general, there has been insufficient capacity to develop national forest certification standards and delivery mechanisms in many developing countries. This has resulted in the limited availability of national certification standards by which to certify. This means that in many cases, developing countries are forced to rely on the generic international standards in order to become certified, which increases costs (international experts need to be contracted, which are relatively more expensive than local experts) and are not always relevant to the local situation.

THE HIGH DIRECT AND INDIRECT COSTS OF CERTIFICATION

While estimates of the costs of certification vary widely (Table 2), it is generally agreed that the costs continue to be a substantial inhibiting factor in many developing countries (Eba'a Atyi and Simula 2002). Costs can be categorized as direct or indirect. The direct costs of certification include activities such as preparation for audits, actual forest management audits, chain-of-custody audits, and yearly monitoring audits. Such direct costs tend to be higher for developing countries, due to the fact that most certifiers are located in Europe and North America, need to be flown in and demand very high fees and wages, relative to locals.

The indirect costs of forest certification include the costs incurred to improve forest management and wood-processing systems to levels that are certifiable. These costs are considerable if the company is significantly lagging behind required certification standards. Studies from Malaysia, for example, indicate that the costs of improving forest harvesting operations from current practices to certifiable levels would exceed current costs by 62.5 percent (Thang 2003). It is widely acknowledged that the costs of managing natural tropical forests sustainably are generally higher than for temperate forests, due to the greater complexity and heterogeneity of tropical forests and the usually difficult access and unfavourable climatic conditions.

The size of the forest management unit is also important when considering the costs of certification. The smaller is the management unit, the greater are the costs of certification on a per unit (hectare) basis. Absolute minimum costs of initial certification of a forest, however small it may be, are at least US$1 000 (Nussbaum *et al*. 2001) – an amount that is overwhelming for owners of small forest areas, common in

TABLE 2 *Estimated costs of certification.*

Source	Location	Cost per hectare[1)]
Baharuddin & Simula (1994)	Developed countries Developing countries	US$ 0.30 – 0.60 5-10% of total logging costs
de Camino & Alfaro (1998)	South America (natural forests)	US$ 0.55 – 21.33
Carrera et al. (2004)	Guatemala (community forests)	US$ 0.10 – 1.90
Simula et al. (2004)	Tropical forests (commercial logging operations in ITTO member countries)	US$ 3.00 – 32.00

[1)] The actual costs of certification vary due to many different factors, which are site specific, and should only be considered on a case-by-case basis. The data presented in this table is only intended to illustrate the large differences in the costs of certification between developed and (tropical) developing countries and do not necessarily indicate the average costs of certification.

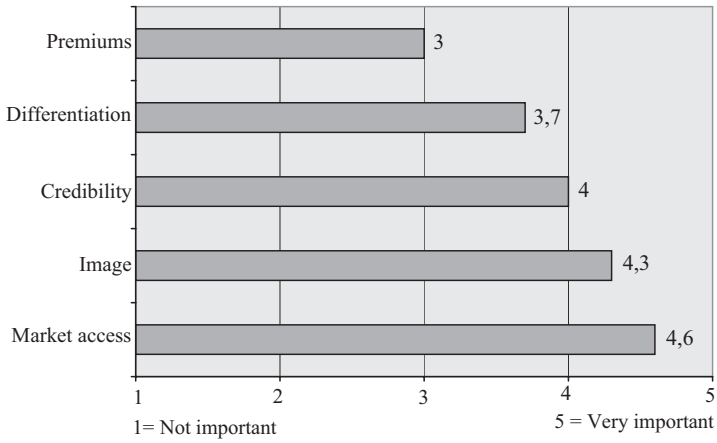
many developing countries outside of large-scale commercial concessions.

WHY THE CONTINUED INTEREST IN CERTIFICATION BY DEVELOPING COUNTRIES?

Given such daunting challenges and the slow uptake of certification in most developing and some developed countries to date, one might wonder why there is still considerable interest in forest certification in these countries.

The driving forces for certification in developing countries are not substantially different from those in developed countries, although there are perhaps additional inducements for developing countries as well. A recent study by Raunetsalo *et al*. (2002) indicated that on a scale of 1-5, market access (4.6) and image (4.3) were the two most important motivating factors for producers seeking certification (Figure 5). Interestingly, prospects of earning price premiums ranked much further down (3.0), perhaps suggesting that producers have accepted the reality that price premiums are unlikely to be realized in most cases.

FIGURE 5 *Producers' motivation for supplying certified forest products*. Source Raunetsalo *et al*. (2002)



Maintaining or gaining market access is a key factor encouraging forest certification for producers in developing countries that have traditionally exported wood products, or hope to do so in the future. Thus, there is substantial interest in certification among major developing-country exporters such as Brazil, Malaysia, Indonesia, and more recently China. There is definite apprehension on the part of many developing-country producers that markets – especially those in Europe and North America – could close to those who are not certified or seen as moving toward internationally accepted standards. Public procurement policies recently introduced or under discussion by various Governments in Europe have been a significant driving force for certification. Many developing countries are discovering that in order to sell to these markets, they need to be certified. Producers also cast a wary eye to the major importers of wood products in Asia (i.e. Japan, China, and Korea), knowing that they too might one day become more discerning in their purchasing and give greater recognition to certified timber and wood products.

Projecting a positive image with regard to forest management clearly remains a strong driving force for many developing countries. Support for certification initiatives can serve as a strong indication of a country's commitment to sustainable forest management, thus enhancing image.

Many countries – including developing countries – are motivated to develop national forest certification schemes out of concern for national sovereignty issues. Countries are understandably resistant to being told by outsiders how to manage their own forests. Countries that have developed national certification standards include Australia, Brazil, Chile, Finland, Malaysia, Indonesia Japan, the United Kingdom, and many of the traditional forestry countries of Central Europe, etc. Several other countries, such as China, Myanmar and Viet Nam, are currently in the process of developing national certification standards (McKenzie and Durst 2005). The advantage of a national certification scheme is that it can be developed by local stakeholders to recognize and address the specific forest and socio-economic conditions of that particular country. However, in order to gain international market acceptance of their scheme, most national schemes need official recognition from an international certification scheme.

A final factor motivating the continued interest of developing countries in certification is the influence of the international donor community and international environmental NGOs. The World Bank/WWF Alliance for Forest Conservation and Sustainable Use, in particular, helps to build awareness of the potential value and usefulness of forest certification and strengthen capacities needed to achieve it through workshops and training in developing countries.

PROMISING OPPORTUNITIES FOR MOVING FORWARD

Despite the relatively slow uptake of forest certification in many developing countries, there are several promising opportunities for moving forward. Initiatives being promoted by FAO and other organizations have direct and indirect influence in advancing certification schemes, particularly in the Asia-Pacific region.

Codes of practice

The development of codes of practice has accelerated in recent years after the publication of the *FAO Model Code of Forestry Practice* in 1996 (Dykstra and Heinrich 1996). The Asia-Pacific Forestry Commission followed with the development of the *Code of Practice for Forest Harvesting in Asia-Pacific* in 1999 (FAO 1999). The regional code has subsequently been used as the basis for developing several national codes of practice in Asia and the Pacific. These

codes provide practical guidance toward sustainable forest management, with particular emphasis on timber harvesting in natural forests. Political support for this process was enhanced by formal endorsement of the regional code by the Association of Southeast Asian Nations (ASEAN) in 2001. Other codes of practice addressing other forestry issues, such as forest management, plantations and wildlife management, are currently being developed.

Stepwise approaches

A recent development has been advocacy supporting the concept of a "phased approach to certification" or "stepwise approaches to certification," promoted by the International Tropical Timber Organization (ITTO). Under a phased approach to certification, full compliance to the certification standard can be achieved in incremental steps or phases. This approach enables the focus of limited resources on one or two tasks instead of trying to address all the necessary tasks at once. A phased approach framework sets milestones and targets, making it easier for forest managers and external parties to assess progress toward meeting certification requirements. The main advantage of this approach is that it makes it possible to reward genuine attempts to improve forest management, even by those starting from a weak benchmark. The Modular Implementation and Verification toolkit (Nussbaum et al 2003) developed by ProForest for WWF and IKEA is a practical application of this phased approach, although it has not yet been officially recognized by the international certification organizations.

Group certification and simplified certification procedures

Group certification was one of the initial mechanisms developed to reduce unit costs and make the certification of small forest ownerships and management units financially attractive. It enables small forest owners to join together to benefit from economies of scale, while maintaining management control of their individual forests. Costs are significantly reduced because it is only necessary for the certifier to conduct a single audit, instead of individual audits of each member's forest. Certification agencies are aware of this issue and are attempting to address the problem of costs to small forests. As just one example, FSC has recently introduced new guidelines for small and low-intensity managed forests, which will further help reduce certification costs for owners of small forests (FSC 2005c). Under the new approach, forests that meet the following criteria will be eligible for certification using streamlined/simplified procedures:

- the forest must generally be smaller than 100 hectares (national initiatives can increase this value to reflect the national situation up to a maximum of 1 000 hectares); or
- the rate of forest harvesting must be less than 20 percent of the mean annual growth increment of all production forests in a forest management unit and the total annual harvest from the unit must be less than 5 000 cubic meters.

Increasing interest in forest certification and certified products

An encouraging development has been the increasing interest in developing national forest certification standards in recent years. Australia, Brazil, Chile, Japan, Malaysia and Indonesia already have well-developed national forest certification standards, all of which are operational. Gabon, a major exporter of tropical timber is in the process of developing a national forest certification scheme. China, which has become a huge importer and exporter of wood products, has begun developing a national certification standard. The ASEAN countries are working toward a "Pan-ASEAN" timber certification scheme. There is also interest in the development of a Pan-African Forest Certification scheme, on the basis if the ATO/ITTO principles and criteria for sustainable forest management. At the same time, there is an upsurge in FSC and PEFC chain-of-custody globally, which may eventually lead to greater demand for certified wood.

CONCLUSIONS

Despite the relatively slow pace of adoption in developing countries, certification is widely recognized as a useful tool for stimulating moves towards sustainable forest management. To date, the focus has been on establishing standards for forest managers and developing a critical mass of certifiable timber. In the future, greater emphasis will need to be placed on:

- strengthening capacities for implementing national forest programmes, policies and legislation;
- improving forest management so that the gap between current levels of forest management and certification requirements decrease;
- reducing the costs of forest certification;
- increasing market access and incentives for certified products;
- increasing acceptance of different certification processes (there is no single correct certification option) by key decision makers, as this influences the acceptance by the general public;
- increasing the effectiveness of marketing among final consumers, so that certification better delivers financial rewards to "good" forest stewards; and
- protecting against illicit felling and illegal trade in timber.

Positive steps in this direction are already being taken through various initiatives such as codes of practice, step-wise approaches, group certification and simplified procedures for certification. A major challenge for certification to address in developing countries – at least in the short run – is to ensure

that financial rewards flow to forest managers who are dedicated to making improvements in forest management, in order to offset the investments required for certification.

If certification is to contribute significantly toward improved forest management where it is most needed (in the tropical developing countries), then it must grapple with the problem of – like a child's report card – somehow rewarding the "most improved" rather than the "top of the class."

REFERENCES

ANDERSON, R. and HANSEN, E. 2004. Determining consumer preferences for ecolabeled forest products: an experimental approach. *Journal of Forestry* 102(4):28-32.

BAHARUDDIN, H.J. and SIMULA, M. 1994. *Certification schemes for all timber and timber products*. International Tropical Timber Organization. Yokohama, Japan.

CAMINO DE, R. and ALFARO M. 1998. *Certification in Latin America: Experience to date*. Network paper 23c. Rural Development Forestry Network.

CARRERA, F., STOIAN, D., CAMPOS, J.J., MORALES, J. and PINELO, G. 2004. Forest Certification in Guatemala Paper presented at the Symposium: *Forest Certification in Developing and Transitioning Societies: Social, Economic, and Ecological Effects*. Yale School of Forestry and Environmental Studies New Haven, Connecticut, USA. June 10 & 11, 2004.

CEPI. 2004. *Comparative matrix of forest certification schemes*. Viewed at http://forestrycertification.info/phpprograms/Content/story_template.php3?txtid=global_area

DYKSTRA, D. and HEINRICH, R. 1996. *FAO model code of forest harvesting practice*. Rome, Food and Agriculture Organization of the United Nations.

EBA'AATYI, R. and SIMULA, M. 2002. *Forest certification: pending challenges for tropical timber.* ITTO Technical Series No 19. Yokohama, International Tropical Timber Organization.

FAO. 1999. *Code of practice for forest harvesting in Asia-Pacific*. Bangkok, Asia-Pacific Forestry Commission and FAO.

FAO, RIFFEAC and UICN. 2003. *Évaluación des besoins en formation dans le secteur forestier en Afrique Centrale. Rapport*. Rome, Organisation des Nations Unies pour l'alimentación et l'agriculture.

FAO. 2006. *Global forest resources assessment 2005: Progress towards sustainable forest management*. FAO Forestry Department. FAO Forestry Paper 147. Rome, Food and Agriculture Organization of the United Nations.

FSC. 2005. http://www.fsc.org/slimf/

FSC. 2006a. http://www.fsc.org

FSC. 2006b. http://www.fsc-info.org

McKENZIE, P. and DURST, P. 2005. *Forest certification in China: latest developments and future strategies*. RAP Publication 2005/08. Bangkok, Food and Agriculture Organization of the United Nations.

Malaysian Timber Certification Council (MTCC). 2004. *Malaysia Criteria & Indicators for Forest Management Certification [MC&I (2002)]*. Kuala Lumpur, Malaysia Timber Certification Council.

MTCC. 2006. http://www.mtcc.com.my/mttc_scheme_certs_holders.asp

NUSSBAUM, R., GRAY, I. and HIGMAN, S. 2003. *Modular implementation and vertification (MIV): a toolkit for the phased application of forest management standards and certification*. Oxford: ProForest.

NUSSBAUM, R., GARFORTH, M., SCRASE, H. and WENBAN-SMITH, M. 2001. *An analysis of current FSC accreditation, certification and standard-setting procedures identifying elements which create constraints for small forest owners*. Oxford: ProForest.

OECD. 2005. http://oecd.org/dac

PEFC. 2006. http://register.pefc.cz/statistics.asp.

POKU-MARBOAH, M., JUSLIN, H., HANSEN, E. and FORSYTH, K. 2005. Forest certification update for the UNECE region, 2003. *Geneva timber and forest discussion paper 39*. Geneva, United Nation Economic Commission for Europe and Foodand Agriculture Organization. .

RAUNETSALO, J., JUSLIN, H., HANSEN, E. and FORSYTH, K. 2002. Forest certification update for the UNECE region, summer 2002. *Geneva timber and forest discussion paper 25*. Geneva, United Nation Economic Commission for Europe and Food and Agriculture Organization.

SIMULA, M., ASTANA, S., ISMAEL, R., SANTANA, E.J. and SCHMIDT, M.L. 2004. *Report on financial cost-benefit analysis of forest certification and implementation of phased approaches*. Report prepared for the thirty-seventh session of ITTO. 13-18 December 2004. Yokohama, Japan.

THANG, H.C. 2003. Current perspectives of sustainable forest management and timber certification. Special Paper presented at the XII World Forestry Congress: Area A-Forests for People, Quebec City, Canada, 21-28 September 2003.