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Forest certification—an instrument to promote sustainable forest management?

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Abstract

Forest certification was introduced in the early 1990s to address concerns of deforestation and forest degradation and to promote the maintenance of biological diversity, especially in the tropics. Initially pushed by environmental groups, it quickly evolved as a potential instrument to promote sustainable forest management (SFM). To date about 124 million ha or 3.2% of the world's forests have been certified by the different certification schemes created over the last decade.

Forest certification shares the aim of promoting SFM with another tool, namely criteria and indicators (C&I) for SFM. C&I sets are mainly developed for the national level to describe and monitor status and trends in forests and forest management. They also provide an essential reference basis for forest certification standards, which set performance targets to be applied on a defined area. Progress in developing these two different tools has been significant.

After 10 years of implementation, it is evident that the original intention to save tropical biodiversity through certification has largely failed to date. Most of certified areas are in the temperate and boreal zone, with Europe as the most important region. Only around ten per cent is located in tropical countries.

The standards used for issuing certificates upon compliance are diverse, both between certification schemes and within one and the same scheme when applied in different regions. However, they are at least equal to legal requirements and often include elements that set actually higher standards.

While the quality of actual audits of the standards is of varying quality, there are indications that independent audits are an incentive for improving forest management. As a voluntary market-based tool, forest certification is depending on the ability to cover the costs incurred and thus on often-elusive green consumer sentiment.

Regardless of many difficulties, forest certification has been very successful in raising awareness and disseminating knowledge on a holistic SFM concept, embracing economic, environmental and social issues, worldwide. It also provides a tool for a range of other applications than assessment of sustainability, such as e.g. verifying carbon sinks.

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Abbreviations: AF and PA, American Forest and Paper Association; ATFS, American Tree Farm System; ATO, African Timber Organization; C and I, criteria and indicators; CBD, Convention on Biological Diversity; CIFOR, Center for International Forestry Research; CSA, Canadian Standards Association; EMS, environmental management system; FAO, Food and Agriculture Organization of the United Nations; FMU, forest management unit; FRA, Forest resources assessment; FSC, Forest Stewardship Council; GDP, Gross Domestic Product; GMO, Genetically modified organism; IPF, Intergovernmental Panel on Forests; ISO, International Organization for Standardization; ITTO, International Tropical Timber Organization; IUCN, The World Conservation Union; IUFRO, International Union of Forest Research Organisations; LEI, Lembaga Ekolabel Indonesia; MCPFE, Ministerial Conference on the Protection of Forests in Europe; NTCC, National Timber Certification Council; NGO, non-governmental organization; PEFC, Pan-European Forest Certification; PPM, Process and production methods; SFI, Sustainable Forestry Initiative; SFM, sustainable forest management; UK, United Kingdom; UKWAS, UK Woodland Assurance Scheme; UNCED, United Nations Conference on Environment and Development; UNEP, United Nations Environment Programme; UNECE, United Nations Economic Commission for Europe; UNFCCC, United Nations Framework Convention on Climate Change; UNDP, United Nations Development Programme; US, USA, United States of America; WTO, World Trade Organization; WWF, World Wide Fund for Nature.

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1. Introduction

For many years environmentalists have targeted their campaigns at politicians and the public as voters in their efforts on ending deforestation, clear-cutting in old growth forests and promoting the maintenance and protection of biological diversity. With forest certification they turned their focus from policy makers to the market and to consumers.

Certification is the process whereby an independent third-party (called a certifier or certification body) assesses the quality of forest management in relation to a set of predetermined requirements (the standard). The certifier gives written assurance that a product or process conforms to the requirements specified in the standard.

Forest certification was introduced in 1993 as a market-based response to address public concerns related to deforestation in the tropics, resulting loss of biodiversity and the perceived low quality of forest management in areas where traded wood products are sourced from. After a slow start spearheaded by the Forest Stewardship Council (FSC), the situation has radically changed when other schemes have become operational by the end of the decade.

Maintaining biodiversity is an ambitious goal. The very concept of biodiversity is abstract, ambiguous and difficult to measure. Many start from the definition given in the Convention on Biological Diversity (CBD) as a starting point, which distinguishes genetic, species and ecosystem levels. The focus of attention in practice is often on the species level. Even if aggregated to forest vegetation types, the sheer number and diversity of these is enormous. Especially in the tropics often little is known about proper management techniques to maintain even the main species of a certain forest vegetation type.

Threats to biodiversity from poor forest management practices are diverse and widespread. The majority of terrestrial biodiversity is found in forests, and half of it is considered to be located in tropical forests (Alfonso et al., 2001). Given a global deforestation rate of about 10 million ha per year (FAO, 2001a) and an unknown but considerably higher area of forests suffering degradation, stepping up efforts in maintaining biodiversity through improving forest management is certainly an important part of an overall strategy.

There are many approaches to maintaining biodiversity, including putting forests under various degrees of legal protection. However, this not only encounters poor enforcement realities in many developing countries. A high percentage of destruction, both in protected areas and production forests, is thought to be caused by people that fight poverty rather than by wealthy exploiters. The underlying causes for forest degradation are many, and they differ from region to region.

Sustainable forest management (SFM) is a concept specifically designed to embrace and reconcile the different interests on forests, including the maintenance

of biodiversity. However, the interests of different stakeholders are rarely fully mutually reinforcing. Interests normally require tradeoffs and some are simply mutually exclusive. Certification of good or SFM has to deal with these diverging values of different stakeholders, including the importance placed on biodiversity maintenance relative to other aspects.

The initiatives on forest certification have set out to tackle an immensely diverse field by using one single instrument across the globe and across all conceivable situations. The ability of the instrument to contribute to SFM and biodiversity maintenance are, however, widely unclear. Some of the key questions are: how is sustainable or good forest management operationalised and verified? How is biodiversity addressed? Does a certified forest contain higher biodiversity value than an uncertified one? Does certification ensure the conservation and sustainable use of biological resources within the forest? Or is it a costly fad, a waste of time and efforts that promises more than it is able to deliver?

The aim of this paper is to assess which role forest certification can play as an instrument to promote SFM and biodiversity maintenance, how far the main concepts have been developed, and what lessons we can learn after about 10 years of implementation. The focus of the paper will be on progress in developing forest certification and on defining what forest certification sets out to verify viz. SFM. Specific emphasis will be given to the relation between forest certification, SFM and biodiversity maintenance.

2. Where are we now?

2.1. Progress in developing and implementing forest certification

Over the last decade a range of initiatives have set up different verification systems with the aim to assure consumers and peers over the quality of forest management. These initiatives are driven by a number of interests and work under different circumstances. This is reflected in the different schemes in operation or in development.

The complexity of the task is enormous. Not only are forests highly diverse around the globe, from dry shrubland in Australia to tropical rain forests in Brazil or Congo and boreal forests in Russia. Also their management differs greatly, depending on the ecosystem and the main intended output. These range from plantation wood to less tangible forest services.

Furthermore, there is a range of stakeholders, different in each situation, that want to be recognised and participate in determining how forests should be managed. They range from public or private forest owners to local communities or indigenous peoples, forest industry and different groups

advocating for the protection of public goods, such as environmental NGOs.

Consequently, forest certification caters for many different peers and their respective interests. For industry and trade, it is an instrument for environmental marketing and market access. For buyers and consumers, it provides information on the impacts of products they purchase. For forest owners and managers, it is a tool for market access or gaining market advantage. For governments, it is as soft policy instrument to promote SFM and sustainable consumption patterns. For environmental movement, it is a means to influence how forests are managed to promote, *inter alia*, biodiversity maintenance.

Today, about four major schemes are operational that certify forests (i.e. using independent third party audit). The total worldwide area of forests certified by these schemes is estimated about 124 million ha in June, 2002 (UNECE, 2002). This number has been growing fast over the last two years, as recently established schemes have become operational, following the example of the pioneering scheme, FSC (Fig. 1). Since early on all these certification schemes have aimed at meeting the needs of the mass market rather than specialist market niches.

New players are still emerging: e.g. the African Timber Organization (ATO) is promoting the development of a regional Pan-African certification scheme. National and regional initiatives are, however, shadowed by the uncertainty about, who will recognise them in the market place, on what basis, and how it will be organised. As one solution, the Indonesian (LEI) and Malaysian (NTCC) national schemes have been undergoing a process towards recognition by FSC but the outcome of these efforts is still unclear.

2.2. Defining and measuring SFM through criteria and indicators

Today, it is internationally accepted that SFM is about more than sustained yield. It includes all forest values: social, environmental, cultural and spiritual. The definition

of SFM used in international forest policy contexts, such as the elements expressed in the UNCED ‘Forest Principles’, the ITTO or the Ministerial Conference on the Protection of Forests in Europe (MCPFE) definitions, reflect this multidimensional complexity.

Over more than a decade, a range of concepts and terms has been used to elaborate a more operational outline of aspects covered by abstract definitions of SFM. The most commonly used tools for this purpose are: ‘principles’, ‘criteria’, ‘indicators’ and ‘verifiers’. Some of these concepts have found wide global acceptance, such as criteria and indicators (IPF, 1997; UNFF, 2001; FAO, 2001b), while others are applied only by individual initiatives. Today, most forest policy experts and actors with exposure to the international debate refer to C&I if it comes to clarify what is meant by SFM.

Regional intergovernmental processes or organisations, such as the International Tropical Timber Organization (ITTO) for the tropical region, the Central American Initiative or the MCPFE, have initiated a regional process for the elaboration of criteria and indicators for SFM. Likewise, but without explicit political commitment, non-European countries in the temperate and boreal ecological zone are involved in the Montreal Process on criteria and indicators.

To date, about 150 countries worldwide are engaged in one or more international processes to develop national level criteria and indicators for SFM (Fig. 2). Of the nine international C&I processes that currently exist, only a few are actually continuously working as a group.

The existing regional and national C&I sets for SFM have been developed from the policy point of view and their main purpose is to identify relevant aspects to be covered at national and/or forest management unit (FMU) levels. They thereby attempt to define SFM operationally. The purpose has been to provide a tool for monitoring of progress towards the goal of SFM and, more importantly, to allow governments and international bodies to monitor and report on the status of SFM in a country or region.

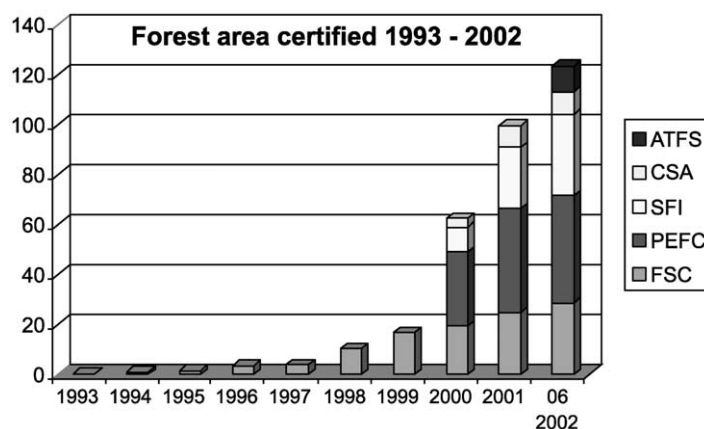


Fig. 1. Total forest area certified 1993–2002 (mil. ha) (UNECE, 2002).

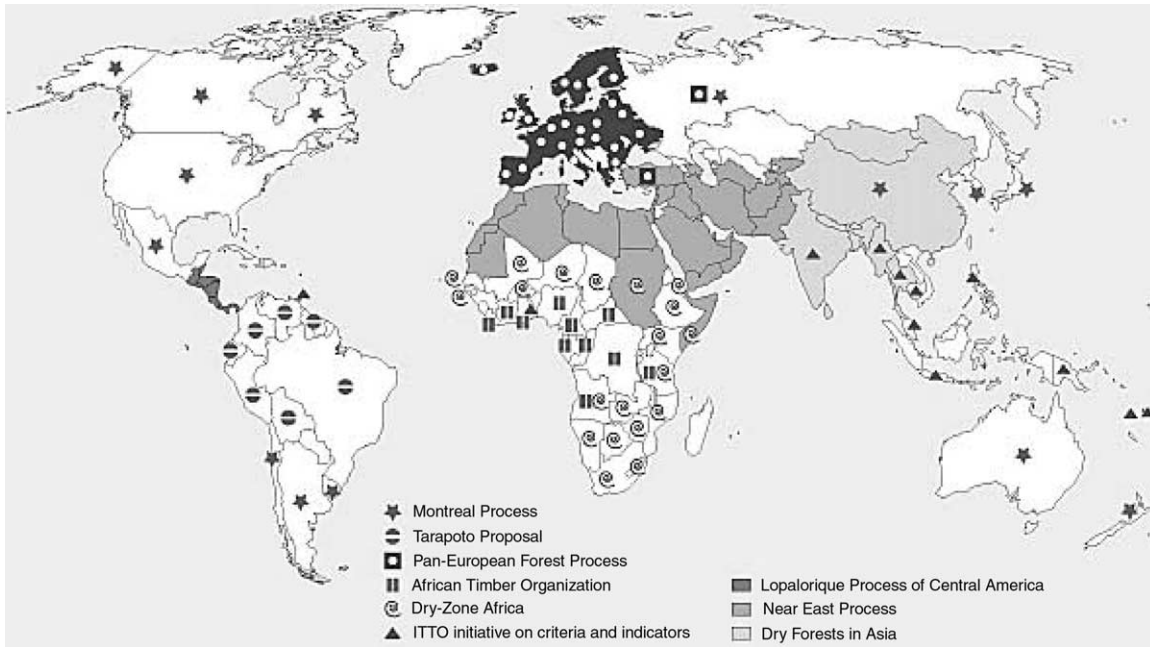


Fig. 2. Participating countries in the various ongoing international processes on criteria and indicators for sustainable forest management (source: Castañeda (2000)).

The conceptual framework behind national-level C&I sets developed by governmental bodies are in many cases not primarily dominated by systematic approaches. Most are issue-based frameworks that mirror the concerns on forests in the early 1990s and most express, through SFM criteria, broadly set political goals. Common to practically all is that they are not structured according to cause-effect-response based frameworks, which are not well suited to the multifaceted nature of ecosystem management.

Over the last decade, and largely due to these government-led initiatives, a widely shared understanding has emerged amongst forest policy decision makers as to what constitutes SFM in the beginning of the 21st century. From the government-led C&I initiatives, a common set of seven national-level criteria has emerged which define sustainable or good forest management (Table 1). Although the wording, and at times the grouping of components within individual criteria, may differ from

process to process, the criteria agreed upon are conceptually very similar.

It is no surprise that also a range of similar indicators can be found in the C&I sets of the different processes. While no consensus view has to date emerged about how many indicators are actually compatible or comparably covered by different processes, more than ten indicators can be considered to be largely identical.

However, many problems lie ahead in further developing and implementing national level criteria and indicator sets. Some of them are technical, such as issues related to data availability and quality, feasibility, resource requirements or data reliability. Some of them are political in nature. The concept of SFM claims to cover the most important aspects in relation to forests and their management. These have to be identified and agreed upon. In practice, this was mainly done by governmental representatives, often international forest policy makers, and in consultation with international environmental NGOs. Progress in awareness raising, further development and use of the C&I concept on sub-national, including local and FMU levels has been mixed, with more progress in temperate than in tropical regions.

Table 1
Seven globally applicable criteria for SFM identified by intergovernmental processes for C&I (Rametsteiner and Simula, 2001)

Criterion
Extent of forest resources
Forest health and vitality
Productive functions of forests
Biological diversity
Protective functions of forests
Socio-economic benefits and needs
Legal, policy and institutional framework

3. Forest certification and C&I for SFM

3.1. Two different tools for a similar goal

Criteria and indicators for SFM and forest certification share some similarities but there are also considerable differences between these two concepts. Both tools are

Table 2
Major differences between C&I and forest certification

Criteria and indicators for SFM	Forest certification
Mainly national level	Sub-national level
Descriptive approach	Prescriptive (standards/requirements)
Mainly used for information sharing	Used for establishing proof of sustainable or good forest management
Used by governments and policy makers	Used by market players

voluntary and promote SFM. They incorporate key elements of sustainability as defined internationally. And they are based on data collection for establishing evidence.

Significant distinctions between C&I applications and certification systems concern scale, purpose, use and user groups (Table 2). Most C&I sets are related to the national level (although a range of FMU level C&I sets were elaborated in parallel to the national sets, e.g. by the ITTO, Tarapoto, or the ATO processes). Forest certification, on the other hand is exclusively concerned with the FMU level or regional scale.

Also the purpose is different. While C&I sets are elaborated to describe the status of SFM, forest certification is essentially based on prescriptive standards. C&I contain no targets or performance expectations, while certification is an assessment against performance standards. The elaboration of C&I sets is often led by governmental and semi-governmental bodies and used for information sharing and reporting. Private bodies for marketing purposes often set up forest certification standards and systems.

3.2. C&I as reference basis for forest certification standards

Developing national level criteria and indicators is relatively easy compared to what is required for making forest certification operational. This instrument verifies good or SFM in individual FMUs or regions, resulting in a 'Yes, accomplished', or 'No, not accomplished' judgement. This requires two things: multiple objective optimisation and tradeoffs between conflicting goals and a need to set performance targets or requirements for each component through so called standards.

Forest certification standards are a combination of performance and process standards. The performance standards usually include ecological, economic and social elements. The process standards define characteristics of the management system of which the environmental management system (EMS) forms a part. These standards are related to the ISO 9000 and 14,000 series of standards for quality and EMSs, respectively. However, unlike forest certification standards, ISO standards do not prescribe the desired output of an operation but the desired quality of the process to be applied.

Forest certification standards refer to the production process only. Production standards are, as the term says, concerned with the mode of production of goods. WTO refers to them as processes and production methods (PPMs), which define the way in which products are manufactured or processed—in this case, how natural resources are extracted or harvested. Forest certification standards are non-product related (on PPM related aspects see also OECD, 1997).

Due to different regional, national and local conditions of forests worldwide, forest management standards (performance and process requirements) have to be based on, and adapted to, the respective regional or local conditions, both with regard to ecological and socio-economic circumstances. For such an adaptation national level C&I are an important reference basis, even though they were primarily developed for reporting on forest conditions at the national level.

Developing a set of C&I at the FMU level requires adaptation and an often higher degree of specification. Some indicators written for the national scale that may not be applicable at an FMU scale, are related to global carbon sink contribution, land-reservations for protected areas or sectoral socio-economic contributions of forestry (e.g. to GDP), etc. However, most of the national-level indicators can also be applied on FMU level (see, e.g. LUCID (undated) on the applicability of Montreal Process C&I on the FMU level).

Over 30 countries or initiatives world-wide work on, or have completed national standards and schemes for forest certification. Among the leading forest certification initiatives, FSC offers the only existing global set of standards that was explicitly elaborated, by a select few, to function as a reference for certification of forest management: the FSC principles and criteria (P&C). Unlike others, the FSC standards are not based on existing C&I sets. The Pan-European Forest Certification (PEFC) Initiative uses the criteria and indicators as well as the operational level guidelines of the MCPFE (see Pan-European Forest Process in Europe in Fig. 2). The Malaysian national initiative has used the ITTO C&I as a framework for their certification standards. Likewise, ATO plans to use the sub-national-level set of principles, criteria, indicators and verifiers as a common framework for a regional certification standard.

The Sustainable Forest Management System Standard of the Canadian Standards Association (CSA) has already been widely used for certification, as have the standards of the sustainable forestry initiative (SFI) of the AF and PA and the American Tree Farm System (ATFS) standards. In addition, several national initiatives have elaborated, or are in the process of elaborating, standards for national use. These comprise both initiatives that are linked with the FSC, or aim at FSC compatibility, such as the Malaysian and Indonesian national certification schemes, and some others that were initiated by governments or forest owners'

organisations. There is also a range of locally applied standards that have been elaborated by certification bodies for situations where no nationally applicable standards exist.

While SFM criteria are usually covered by forest certification standards in a way or another, indicators are less systematic and variable, depending on local ecological and socio-cultural conditions reflecting their diversity. Given the relatively early stages of indicator and standards development, it is foreseen that C&I concepts will converge further in successive rounds of improvement, and that C&I frameworks will be increasingly integrated with forest certification standards. While the coverage of topics addressed is converging further, the performance levels will remain different.

Regarding performance requirements for indicators, far reaching judgements and crucial decisions on relative values of different aspects of forests and forest use are to be taken. The process of defining components of SFM, e.g. through indicators, and setting required performance levels for these components has been different in these initiatives. Several early initiatives have used basic global guidance by the FSC, yet relied mainly on 'expert knowledge' of a few people involved. Later on, in improving the situation, standards were increasingly elaborated for individual countries, and requirements for participation of a wider range of stakeholders were set up by the different schemes that evolved. This allows to better taking into account the full range of forest values for society.

Based on national level standards, the current level of performance and the desired direction of change has to be further defined in local situations in order to be able to conduct an actual certification audit. Due to the heterogeneity of local conditions, forest ownership and size patterns there is no detailed prescription of thresholds available. It does not even appear desirable to specify common threshold levels, e.g. across forest types. Establishing harmonised standards for SFM seems, therefore, to be neither possible nor desirable. Nevertheless, at the international level, a common global verification and recognition system for forest certification would need, as a core element, an adequate basis for comparison of different standards against established quality criteria (Rametsteiner and Simula, 2001).

4. The impact of forest certification on SFM and biodiversity—10 years of experience

The impact on SFM of certification is difficult to assess in view of the limited practical experience. However, a few factors can be determined that have a distinct influence on impacts. These are: (a) how large areas are covered by certification and the characteristics of these forests, (b) the standard requirements used and (c) the quality and effect of enhanced independent external audits and/or control.

Furthermore, forest certification is a market tool and thus driven by market forces, including the demand for certified forest products by consumers.

4.1. Certified forests are mainly in the Northern hemisphere

As has been said before the total forest area certified to date is estimated about 124 million ha in June 2002. This number has been growing fast over the last two years and is destined to grow further quite rapidly. On a global scale, however, certified forests still represent a small fraction (about 3.2%) of the total area of the world's forests, estimated to be 3869 million ha (FAO, 2001a).

The overall geographical distribution of certified forest area is indicative of the impact that forest certification has had so far. Most certification initiatives have taken place in Europe or North America. The share of developing countries in the total certified area of the world is only about 10% at present (Fig. 3). From the information available, it is unclear which ecological forest types are certified and exactly how much of the certified area is plantation, natural or semi-natural forest.

Based on information provided by the FSC, the share of plantations of the total forest area certified by FSC in developing countries is about 40%. In some countries, such as in South Africa, practically 100% of certified forests are plantations. Assuming that natural or semi-natural forests have higher biodiversity than plantation, it is evident that certified forests per se are no guarantee for higher biodiversity than non-certified forests.

From the small areas of tropical forests certified, it is clear that forest certification has to date not contributed much to improvement of forest management in the tropics

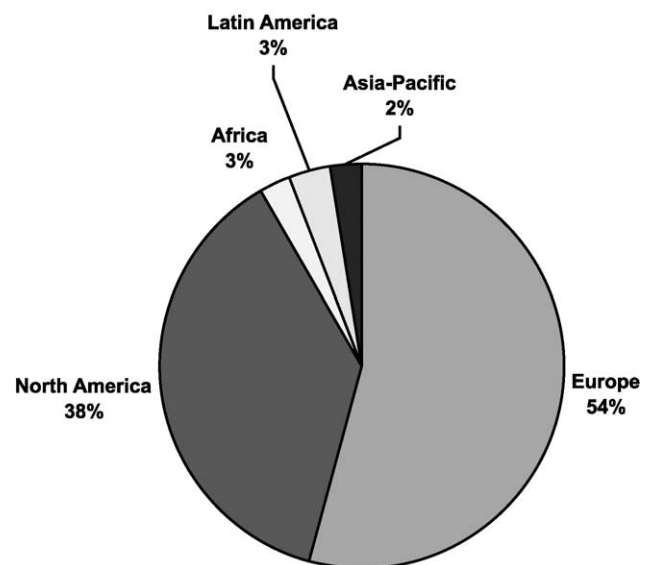


Fig. 3. Certified forests by region, January 2002 (source: Atyi and Simula, 2002).

and is likely to have had little effect on non-plantation forests in temperate regions in Africa and Latin America. But some countries, e.g. Brazil, Indonesia, Malaysia and Ghana are examples of developing countries where national schemes are in operation or are expected to be operational soon.

In mid-June 2002, there were about 28.5 million ha of FSC-certified forests, of which about 68% are located in Europe. A large majority of these forests are owned by the state (e.g. 3.8 million ha in Poland) or large forest industry corporations (e.g. 8.9 million ha in Sweden). Certifying such forests was comparatively simple due to the large size of forest holdings and available written documentation. However, the progress in the FSC certification of small-scale private forest owners has been slow. From a global perspective the overall impact from certifying such comparatively well-managed forests is likely to be limited. Only if improved practices spread to poorly managed forests, a significant impact can be expected (Atyi and Simula, 2002).

The area certified under the Pan-European Forest Certification (PEFC) was 42.9 million ha in June 2002, making it the largest scheme in the world accounting for 42% of the total. Designed with a view to take the needs of millions of private forest owners with small forest properties in Europe into account by focusing on larger regions within countries, certifications are prone to be affected by free riders with often little means to implement sanctions on them effectively. Again, no dramatic changes of forest management are to be expected in the short term as a direct effect from that approach.

The SFI of the AF and PA conducts certification mainly of its member's industrial forests in the United States, but has expanded also to Canada. SFI has entered into a recognition agreement with the US-based ATFS, mainly participated by smallholders. Their effects on biodiversity maintenance can be inferred by comparing the standards used.

4.2. Forest certification standards are diverse

The interests and views of the people behind the respective certification schemes mainly drove forest certification standards that have been elaborated over the last 10 years. As a matter of fact, these standards vary considerably, reflecting the diversity of stakeholder views and local conditions.

The standard requirements of all existing certification schemes make reference to complying with the law and ensure that requirements are not below the various relevant regulations of the country where they are used. Most standards have elements, which represent higher or broader than legal performance requirements for forest management. Standards may incorporate silvicultural or logging guidelines (such as for reduced impact logging) which may be the authorities' recommendations but not

mandatory, or they may pinpoint specific aspects which are critical for environmental and social impacts in local conditions.

Hornborg (1999) took 14 criteria to compare forest legislation and forest certification standards systems in Norway, Sweden and Finland. He found that between 30 and 60% of the standard elements exceeds national forest legislation (nature conservation laws were not taken into account). He notes, however, that the levels of regulatory requirements are very different in the countries compared.

Wood (2000) examined eight certification standards from a variety of regions and certification systems, covering FSC standards of different countries as well as the PEFC and SFI standards. He found that although there are many commonalities between these standards, there are also discrepancies and inconsistencies that may amount to an uneven playing field in the realm of international trade.

There are even substantial differences between standards under the same system. For example, the Swedish FSC standard is structured differently than the FSC P&C. In general, the Swedish standards seem to be much more succinct than other regionally developed FSC standards. They take a more simplified approach, allowing a greater degree of freedom in their interpretation and application. The UKWAS standard, which was harmonised with the national FSC standard through a joint audit protocol, does not follow the FSC P&C structure. The FSC draft for the Pacific Northwest is a straightforward standard for the US interpretation of the FSC but for many of the principles a great deal of freedom is allowed in interpreting and applying the criteria.

The Finnish Forest Certification Standard (FFCS), used for PEFC compatible certification in Finland, focuses on established forestry principles, and concentrates on the environmental and biological impacts of operations. The SFI standard allows a high degree of freedom for organisation to define its own policies and plans. In terms of environmental standards there is an emphasis on improving forest productivity. In contrast to other certification systems, which emphasise ecosystem-based harvesting, one of SFI's objectives is to maximise yield. The use of genetically modified organisms (GMOs) is listed as an appropriate method and the programme participants are allowed to continue the prudent use of forest chemicals to improve forest health and growth. There are minimal requirements with regard to social and community standards, and no mention of consideration of indigenous people and comparatively limited requirements for public consultation.

The Meridian Institute facilitated a comparison of the FSC US and SFI standards in a desk audit by a panel selected by AF and PA, FSC-US and The Home Depot. The panel, working on the principle of consensus, identified 31 issue areas that it considered to be of greatest importance and general interest. They found that both programmes address about 20% of these issue areas by using essentially the same approach. These mainly concern protection issues.

Table 3

Subject areas that are addressed in only one of the two programs (FSC, US or SFI), or using fundamentally different approaches (Meridian Institute, 2001)

Special and unique forest areas
Use of chemicals
Use of genetically modified organisms
Use of management of exotic species
Maintenance and conservation of biological diversity
Maintenance of ecological function
Assessment of environmental impacts
Consultation and public reporting
Health, safety and general welfare of employees and contractors
Compliance with applicable laws and regulations
Recognition of indigenous peoples rights
Education and outreach
Forest management research
Assessment of social impacts
Contribution of socioeconomic benefits to local community/region

Another third of the issues is addressed by both programmes, but with different approaches. These mainly concern management related issues, including regeneration, road building, harvesting and related management.

The majority of issue areas identified by the panel, however, were addressed in only one of the two programmes, or fundamentally different approaches were used (Table 3). The topics reveal diverging views on a good many topics related to close-to-nature forestry as well as on social aspects in the US. These issues delineate current lines of conflicts over values and approaches between environmental and social advocacy groups and resource owners and managers, not only in the USA but also in the Western hemisphere. They also show differences in opinion about forest management by those actually owning the forest and those who try to impose requirements upon others concerning how to manage forests. It is to be expected that forest owners and managers will be more conservative in calling for changes in their own practices and in setting higher performance requirements than those currently existing.

Others have made similar comparisons of standards, yet from a specific point of view. FERN (2001), an environmental NGO compared standards of different certification in two countries, viz. Sweden and the United States. They found that the standards elaborated by the FSC, that usually do not emphasise the property and decision rights of forest owners, are more requiring than standards elaborated by organisations representing or advocating forest owner rights more strongly, such as the SFI or PEFC.

A comparison between the certification criteria of FSC Germany and PEFC Germany found that considerable differences exist concerning banning the use of pesticides and the choice of tree species for replanting. While FSC advocates close to nature forestry based on, but not restricted to, non-introduced, indigenous species, PEFC allows planting of non-indigenous species on a larger scale.

The German FSC standard requires setting aside forest areas in public forests.

On many issues FSC and PEFC aim at similar goals, but use different means, e.g. preference of natural regeneration, no clear cutting but selective single or group harvesting, increase of dead wood and ecologically valuable trees, ban of fertilisers and pesticides, protection of biotopes, as well as water and soil protection. Only the FSC has elaborated separate rules for certifying plantations, however, once certified, the wood is marketed with the same label as wood from natural forests.

Further, different issues exist on different continents and in different regions. While GMOs are an issue in the United States, they are not so in Europe. Similarly, there is a wide agreement to ban or restrict the use of fertilisers and pesticides in many areas in Northern and Western Europe, and to refrain from establishing large areas of plantations. Also clear cutting is defined very differently in different countries, ranging from very small areas of two or less hectares to 40 ha and more.

These comparisons reveal that it is likely that standards used for certification actually establish, on a voluntary basis, somewhat higher levels of requirements on forest management than those set by legislation. They are furthermore likely to establish some requirements for aspects of SFM that are little or not explicitly addressed in legislation. But forest certification standards are not per se a guarantee of high biodiversity maintenance requirements, be it for plantations or natural forests.

However, the difference between regions on specific aspects as well as between different certification schemes is considerable. In general, standards often seem to be set so that they constitute a benchmark of good forest management for the specific region, as seen by those involved in elaborating the standards.

4.3. Independent audits to forest management has benefits

A written standard alone is no guarantee that it is actually implemented. Thus the auditing builds a crucial part of forest certification, having the task of establishing empirical evidence. The verification whether or not and to what degree forest management actually complies with standards represents a challenge for auditing for a number of reasons: (i) many 'new' aspects of forest management need to be verified, as the C&I for SFM are comprehensive covering several aspects beyond the legal requirements; (ii) information may not be readily available and the assessment may have to be more qualitative than quantitative due to the nature of indicators, or lack of baseline information; (iii) broader than technical forestry skills are needed in the assessment of non-forestry criteria; and (iv) detailed certification audits are costly.

In practice, certification bodies and auditors tend to verify the forest certification standards very differently.

This high variability can be observed between different forest certification programmes but likewise between different auditors of the same scheme. Any comparison of certification audit reports is evidence of this fact. Assessments are often a fairly informal process. In many cases a large number of the standard requirements are either overlooked, not included in a sample-based check, or defined as inapplicable. Consequently, the same certificates may hide considerable variation in the actual quality of the forest management.

The impacts through independent audits are made visible by the ‘corrective action requirements’ (CARs) by assessors of a certification programme. Table 4 lists areas where CARs were identified in the audit reports of 32 certification assessments conducted by FSC-accredited certifiers in Europe by mid-1999 (issues with less than three corrective actions requested were omitted) (Rametsteiner, 1999).

Table 4 shows that improvements in forest management practices in Europe due to FSC certification are indeed likely to occur. Areas for improvement are most likely related to the management processes of organisations, especially in planning and monitoring. In almost every second assessment CARs concerned management plans, indicating more emphasis on the existence and accuracy of written documentation in forest management (which, by the way, makes the life of auditors less difficult). The other areas requiring further action were social relations and ecological improvements. The table also shows that FSC certification in Europe has to date acted mainly as an incentive to render forests into a state closer to their potential natural vegetation by increasing the diversity of trees and mixed stands, improving the protection of rare and threatened species and their habitats, and reducing the use of chemicals in forest management. A similar study undertaken in the UK in 2001 (Goodall, 2002) found similar evidence of improvement incentives.

Muthoo (2001), former head of FSC, notes that detailed case studies made of FSC certifications on a global scale have demonstrated the wide variety of improvements made in certified forests, sometimes minor, but sometimes involving radical departures from the previous management style in a region. He refers to certified tropical forests in parts of the Amazon basin and to South East Asia as conspicuous examples of management that comply with national and international standards and claims that they are in a striking contrast to many of their neighbours.

It can be safely said that forest certification has brought along improvements in internal auditing and monitoring in forest organisations. It also provides an impartial external view to forest owners on the management status of their forests. This is particularly important for those owners who are not themselves managing their forests (Baharuddin and Simula, 2001).

The long-term impacts on forests are likely to increase the level of management quality towards improved conservation of the forest ecosystem. While the actual

effects related to production techniques remain to be seen, it is likely that decision makers on operational forest management become more sensitive to issues related to natural regeneration/afforestation, thinning operations, reduced impact harvesting, road construction, the use of fertilisers and pesticides, and relations with society. The impacts on forest management will likely differ between regions, due to different forest management regimes and ownership patterns.

Table 4
Number of ‘Corrective Action Requests’ and issues addressed by independent audits for FSC certification in Europe (Rametsteiner, 1999)

Area	Issue	Number of CARs requested
Forest policy, laws	Management policy and environmental policy	III
Environmental impacts	Deciduous trees/mixed forests	IIIIIIII
	Silvicultural treatment/harvesting	IIIIII
	Rare and threatened species	IIIIII
	Fertilising	IIIIII
	Pesticides	IIIIII
	Dead wood	IIIIII
	Age class distribution	IIII
	Burned areas	IIII
	Roads	IIII
	Soil and water protection	IIII
	Game population	IIII
	Management plans	General management plan
Administrational design		IIIIIIII
Regeneration planning		IIIIII
Ecological landscape planning		IIIIII
Economic planning		IIII
Monitoring and assessments	Monitoring system	IIIIIIII
	Natural value assessment	IIIIII
	Data inventory system	IIIIII
Community relations and workers rights	Contractor relations	IIIIIIII
	Stakeholder involvement	IIIIII
	Worker education and training	IIIIII
	Worker health and safety	IIII
Indigenous people’s rights	Indigenous rights	IIII

4.4. Forest certification is ultimately a market driven tool

The idea behind certification is that consumers, concerned about deforestation and forest degradation, will prefer to buy timber products from well-managed forests. The process of certification identifies these forests, and the products coming from them. Through certification, individual forests are assessed against publicly available standards and, once compliance is verified, the forest owner obtains the right to label his/her products. At the point of sale, the label tells the consumer that the product is sourced from a forest that meets certain environmental and social standards.

Hard data on actual supply of, and demand for, certified timber are hardly available. However, it is apparent that most certified timber is produced in the boreal and temperate zones. Furthermore, less than 10% of the total industrial roundwood harvested in the world annually enters international trade, of which no more than 10% originates in tropical forests. Measures directed at that trade can only marginally influence forest management.

The demand for certified forest products is largely confined to environmentally sensitive markets in developed countries, particularly in Europe, but it is expected to become an element in all major markets, including in advanced developing countries. The supply chains of wood and paper products are often long and extensive and, therefore, demand requirements in one big market area tends to influence most countries involved in international trade of wood raw material or primary and further processed products.

The fear of losing market access is and was an important factor for the attention that forest certification has quickly gained in many countries involved in international trade worldwide. Attention for forest certification in turn has exposed many practical decision makers in forest management to a more holistic concept of SFM.

In spite of the fact that forest certification intends to add value to end-products, the market has been reluctant to pay for it. Indeed, in Europe certification has essentially not produced the price premiums for products from certified forests which some advocates had initially expected. Instead, big retail chains for wood products have used certification as part of their 'green marketing' strategies and appear to be the main beneficiaries for the time being.

Market analyses have shown that tropical forests and developing countries could benefit from price differentials and better market access through certification (see Rametsteiner, 1999 for a review of surveys). It is, however, uncertain whether such premiums could be obtained in the long run when the volume of certified supplies matches the respective demand. In particular, tropical timber producers are afraid that their difficulties to achieve certification status would inequitably increase their costs and take time to reap market benefits.

The benefits of forest certification do not come free, as certification adds costs and the standard requirements can lead to forgone opportunities for forest owners. Of particular concern have been the cost implications for small-scale private forest owners and producers in developing countries. The latter have suffered from loss in market share, as they have not been able to increase certified area according to market demands.

If it is assumed that the decision to get certified depends on individual cost-benefit calculations, individual owners will be inclined to obtain certification the less they have to change their existing management. Forest certification will thus primarily attract those where little or no impact will occur. It may attract those that are most in need for improvement the least, except if somebody else is paying the cost.

Any increased level of performance requirements comes at a cost that many fear that they cannot pass on. Not only will the provision of goods from forests tend to get more expensive, entrepreneurs may also take increasing requirements as a signal for decreasing investment in the sector. There is thus a risk that the instrument becomes an obstacle for the promotion of forest-based products, as similar demands for environmental performance are not put on substitutes. This tends to favour substitutes, which are not subject to similar demands on claims how the natural resources are managed in areas where their raw materials are sourced.

5. Discussion and conclusion

The review of progress made in developing and implementing forest certification has shown that forest certification is already quite well established. However, much is still in development and many elements are in a continuous process of further adjustment.

An analysis of the impact of forest certification on SFM and biodiversity indicates that the instrument is likely to have limited but positive direct impact on SFM and biodiversity. In how far forest certification is effective in ensuring the conservation and sustainable use of biological resources is unclear. There is an emerging consensus that the effects are highly variable, depending on local circumstances. It is also likely that forest certification does not work against biodiversity conservation but is supportive, within the wider scope of SFM (ITTO, 2002). However, few facts would support a conclusion that forest certification is a particularly effective instrument for biodiversity maintenance. This is the more so as the most important biodiversity threats are found in tropical or developing countries, while forest certification is mainly a tool used in industrialised countries.

Forest certification is still one of the most contentious issues in international forest policy as it is a trade-related instrument and countries feel that it could influence their

competitiveness and market access. It needs to be recognised that developed countries, countries in transition and developing countries are in quite different situations with regard to their needs, possibilities and resources to make use of certification. For the last two groups of countries, certification is mainly perceived as yet another market requirement imposed by importers which is difficult to meet and therefore risks becoming a barrier to trade rather than helping these countries to promote their exports.

Boycotting or discriminating tropical timber is constantly looming. Some local governments in Central Europe require that timber products can only be used in their projects if they are certified while others have more blunt measures to restrict tropical timber use (Belgium, Germany, the Netherlands and the UK). The Buyers' Groups of the Global Forest Trade Network, representing a market factor in about a dozen countries, have made commitments to buy only certified products. These commitments have not been possible to meet due to lack of available supply. It is unclear whether these groups will accept certificates issued by different, including national, schemes or on what conditions it could take place.

The crux of the international debate is what constitutes a credible certification scheme and whether or how cooperation between individual schemes should be arranged (if at all). Mutual recognition has been proposed as one of the solutions to the problem of proliferation of national certification schemes. If each scheme used their own label in international trade, it would be difficult for buyers and consumers to establish which ones should be considered reliable. If left for competition to solve, many producers with certificates issued by their national schemes, particularly in developing countries, would have insurmountable difficulties in defending their market position. Buyers cannot be expected to make assessment of the credibility of certificate as the task is complex and requires expertise and information they do not usually have.

One key element of certification systems is forest certification standards. Forest certification standards have been largely developed outside the established standard setting bodies, and private bodies operate schemes and programmes. Many of the standards have been developed through a multi-stakeholder approach, and thus the characteristics of each standard are guided in large part by the composition of each standards development team. As continuous improvement is an inbuilt element in most certification systems, the further development of standards is destined to move towards better convergence of differences.

Criteria and indicators are increasingly used as the reference basis for certification standards. Also criteria and indicator sets are more at the beginning of their life cycle rather than a finally developed tool. Over time, and with increased awareness of the many applications of C&I sets, and the differences between countries and regions, a higher convergence is most likely to occur. This might become

more visible once a global set of compatible criteria and indicators is emerging. Similarly, criteria and indicator sets are likely to become more structured drawing on around theory, rather than on an ad hoc list of issues. The further development, however, is an iterative process by nature. It can be expected that the conceptual compatibility of various C&I sets will further increase, thanks to their future development. Progress in this area will be highly important for regionally adapted, yet globally recognisable certification standards.

One important feature in the certification standards and the criteria and indicator sets is their broad scope addressing environmental aspects, labour relations, occupational safety and health, resource use rights, employment, etc. These elements are parts of sustainability, which in the past have been considered issues to be managed separately, but have increasingly been considered to form integral parts of SFM in international forest policy since the early 1990s.

A particular strength of forest certification is that it constitutes an incentive driven approach that can be used in different applications. As a tool, certification, involving a predetermined standard and independent auditing, has broader applications than those targeted at market communication. Bass and Simula (1999) developed a tentative typology of certification and verification services applicable in the forestry sector. These comprise the market-oriented certification of forest management quality, the verification of specific forest management requirements, the verification of legal compliance, the certification of carbon sequestration and other environmental services, and finally the certification of EMSs.

However, without tangible benefits deriving from certification in terms of improved competitiveness, enterprises will have little incentive to improve forest management with higher costs. There would be even less motivation for the industry to submit themselves to stricter controls than those at present. The problem is particularly serious in developing countries and may not be solved through piecemeal partial solutions like certification, which still has not proved its effectiveness. Comprehensive development strategies towards SFM would be needed where certification and labelling can sometimes play a useful complementary role.

As a whole, the main overall impact of forest certification to date seems to lie in its role to promote a more holistic concept of SFM to which forest management decision makers get exposed. Forest certification seems to be an issue that is likely to remain on the agenda, especially if different uses can be made of one and the same mechanism. Criteria and indicator sets and forest management certification are complementary approaches to understanding and advancing SFM. Both are likely to evolve and become increasingly integrated over time. C&I add value because they provide a framework for gathering and presenting data on forest conditions at varying scales. Certification remains

focused on verification at the FMU level. The two approaches, while related, will continue to serve different functions.

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