

Impacts of sustainable forestry certification in European forest management operations

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Abstract

The article evaluates impacts of forest certification in promoting sustainable forest management in Europe. Forest certification is one of the most widespread non-governmental initiatives for sustainable forest management with 400 million ha being certified by 2011. We have analysed 1000 non-conformities raised by certification bodies during 245 FSC forest management audits in 32 European countries. The raised non-conformities indicate the areas where certification has had largest impact on enforcing sustainable forest management. Results reveal biggest challenges in ensuring protection of nature values and stakeholder communication.

Keywords: forest certification, Europe, FSC, sustainable forest management, non-conformity.

1 Introduction

Sustainable use of natural resources has been a key topic in 21 century. Forests cover about quarter of the world's land area and provide direct livelihood for millions [1]. As the world's population and demand for forest products is increasing, focus has shifted from forest conservation towards sustainable forest management (SFM). Forest certification is gaining legitimacy in promoting sustainable forest management [2] and there is increasing consumer demand for sustainably produced products [3]. Academic research in relation to environmental certification has notably increased during the past decade [4] and market-driven certification systems are seen as legitimate part of global natural resource use governance systems [5].



During past 15 years, a combined area of almost 400 million ha has been certified under the two leading forest certification schemes: FSC and PEFC. Significant part of the forest industry has adopted certification as a necessary means of business, which is evidenced by the total number of about 30 000 chain of custody certificates issued to timber industries. With rapid development, it is increasingly important to analyse the usefulness and impacts of certification. Schepers [6] accurately describes the key challenges of environmental certification systems in his study on the legitimacy of FSC certification: “Ecolabel governance schemes must both convince the world (or the relevant portion thereof) of their true concern for and ability to protect the environment and its peoples (moral legitimacy) and the industry participants of their ability to deliver premium prices on the goods certified by the scheme (pragmatic legitimacy).”

The objective of this study is to evaluate the impacts of forest certification in promoting sustainable forest management in Europe. Using the non-conformities raised during certification assessments, we identify the areas where the largest gaps exist between actual forestry practices and standards of sustainable forestry. We also analyse the differences between Eastern and Western Europe. Since FSC is arguably the organization with most recognized international standard for well managed forests [7], we are making an assumption in this study that FSC requirements represent broad multi-stakeholder agreement for sustainable forest management practices.

We have analysed 427 forest management certification reports from 32 European countries written by third party certification bodies during 2005-2010. All the non-conformities were extracted from the reports (2 177 in total) and a random sample was made of 1 000 non-conformities (representing 245 reports), balanced equally between Western and Eastern Europe. The non-conformities are mandatory for certified operations to follow, if they want to maintain certified status. Hence they provide specific and valuable information about how forest certification is enforcing sustainable practices in the field.

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2 Theoretical background

2.1 Market based mechanisms to promote sustainable forest management

Sustainable forest management (SFM) is one of the key concepts used throughout the last two decades to address forest degradation and deforestation. The mechanisms to promote and enforce SFM, can broadly be classified into two categories. In the traditional government-based model, better forest management is promoted by law enforcement, which is carried out by public state authorities on national and sub-national level. Alternative mechanism is market-based



model, where SFM is promoted by markets and consumers via requesting products from sustainably managed forests. Forest certification is prime example of such a system as described by Klooster [8]. Once a forest manager commits to participate in a certification system, compliance with the agreed principles of SFM is “enforced” by third party certification bodies. Participation in the scheme is voluntary, however only by maintaining its certified status, can the forest manager sell and label its products as being certified and thus meet the market demand for products from sustainably managed forests.

Certification standards have traditionally been classified into process (e.g. ISO14001) and performance standards (e.g. timber strength grading). With the rise of market driven environmental certification, this distinction is becoming blurred. Product labelling is important to link the goods to the sustainable markets, however conformance with both process and performance requirements is normally expected by stakeholders. During the last decade the term “environmental and social standards” has been adopted to indicate standards with main focus of promoting higher environmental and social responsibility within the supply chain and among producers [4, 9]. Evidence exists that such market-driven accountability systems are increasingly gaining international legitimacy [10].

2.2 Forest certification systems

Forest certification emerged in the early 1990s as an alternative, market based initiative, to promote the sustainable use of forest resources and help avoid forest degradation and deforestations [11]. Two major forest certification systems exist. FSC was established in 1992 by a community of concerned industry and environmental and social NGOs. It emphasizes stakeholder involvement and transparency. PEFC (Programme for the Endorsement of Forest Certification) was established in 1999, as an alternative to FSC, which was seen not so suitable for small forest owners. In 2004, PEFC [12] became an umbrella organization, combining all the existing major forest certification schemes (except FSC).

In FSC system the basis for forest certification is FSC Principles (10) and Criteria (56) (FSC P and C) which are globally applicable [13]. The FSC P and C have been developed in a transparent, global multi-stakeholder process, which allows considering it a legitimate example of international non-state agreement of sustainable forestry [7]. In the process of national adaptation, indicators are developed for each criterion. The indicators help to interpret the criteria in the national context and set more specific, measurable basis for auditing. The FSC P and C covers a broad scope of issues from legal compliance and land tenure (principles 1 and 2), to specific topics as indigenous people or management of high conservation value forests. The standard contains one principle with economic focus (principle 5), two principles with social focus (3 and 4) and two principles with mainly environmental focus (6 and 9). Principles 7 and 8 are focusing on system elements (forest management plan and monitoring respectively).

The first FSC certificates were issued in 1993. In 1995, first four certification bodies were formally accredited to conduct FSC certification. A year later first



certified final product entered the market. Since then, the certified forest area has been steadily increasing, with majority of the certified forests being in North-America (39%) and Europe (42%) [14]. As of August 2011, the certified area is 140,5million ha globally. 1049 FSC forest management certificates have been issued, covering 79 countries. The number of chain of custody certificates has followed the trend and as of August 2011, there are over 21 000 valid FSC chain of custody certificates issued [14] with over 10 000 of those issued in Europe. According to FAO data [1] the global forest area is 4,03 billion ha, out of which 1,2 billion (30%) is primarily used for production of wood and non-wood forest products. In this context, the FSC certified forest area of 140million ha equals to 3,5% of global forest area and 11,7% of the global forest area used primarily for production. Under the competing umbrella of PEFC, 234 million ha have been certified as of June 2011 [12]. The PEFC certified area in Europe is 69 million ha. Although the global certified area under PEFC is larger than FSC, the uptake and adoption of PEFC system among the industry is lower. As of June 2011, there are 8 248 chain of custody certificates issued, which is about 40% of the FSC chain of custody certificates [12].

2.3 Forest certification impact studies

Economic, environmental and social impacts of certification have been studied. Research indicates lack of price premium for certified material [15–17]; however evidence of increased market access or possibility to maintain it exists [16]. Environmental benefits of certification have been identified by some authors [18, 19] although clear empirical evidence in relation to this is still lacking. For example Cerutti *et al.* [20] found that in Cameroon FSC certified forestry operations had to reduce the logging volumes in average 18% compared to the practices used prior to certification. Positive impacts of certification on biodiversity have been also questioned by several authors [21, 22] and suggestions for improving FSC standards have been proposed to increase positive impacts by Löhmus and Kraut [23]. The key social benefits of certification are frequently claimed to be better communication with stakeholders and better public environmental image [24]. Certification is also seen as positive tool by some forest managers to reduce the risk of negative media campaigns and boycotts [24].

Few authors have used the same method as employed in this study. Newsom *et al.* [25] studied the non-conformities raised in United States during FSC forest certification. Masters *et al.* [26] studied the non-conformities raised in Canada during audits of FSC, CSA and SFI forest certification systems. Both studies concluded that significant changes were required from most operations undergoing certification. Masters *et al.* [26] also noted that the changes required within FSC forest certification were of much greater magnitude than within the other forest certification systems. Rusli and Nabilah [27] studied issued non-conformities in Malaysia and concluded positive impacts, however emphasized the importance of a long term perspective.



3 Methodology

For the study, the non-conformities documented by independent certification bodies in the FSC forest management certification public summaries were extracted and analysed. For the sample we used all FSC certified forestry operations in Europe with valid forest management certificates as of 1st September 2009. In countries with over 20 forest certificates (Germany, Lithuania, Russia, Sweden, UK), the sample was limited by randomly selecting 20 forest certificate holders. This resulted in sample of 427 forest certification holders from 32 countries. For each certificate holder, we downloaded the latest assessment report public summary from the homepage of the certification body or from FSC public database (info.fsc.org). We chose to use the assessment reports, since compliance with full standard is always checked during assessment, while only a subset of requirements may be checked during annual audits. All non-conformities were manually extracted from the reports and entered into a spread sheet program.

The sampled reports contained 2177 non-conformities, out of which we randomly sampled 1000 non-conformities, equally balanced between Eastern and West Europe. Important historical and social differences exist in relation to the forest ownership, management practices and level of biodiversity between Eastern European countries.

To analyse the data, we classified each non-conformity into one of the predetermined categories (adopted from Newsom *et al.* [25]) (Table 1). The classification has four broad categories with specific topics in each: A – forestry and silvicultural topics; B – ecological topics; C – Social topics; D – System elements. Non-conformities were only classified under topics in category D (system elements), when they were so general they could not be associated with any specific topic under other three categories (A, B, or C). Category D6 includes formal non-conformities which are not related to forestry. Due to this, the results described in section 4 do not consider category D6.

4 Results

4.1 Non-conformities and differences between East- and West-Europe

The total largest number of non-conformities was raised under category C – social and economic focus (279), followed by category B – ecological focus (269). Silvicultural aspects received least non-conformities (144). 157 non-conformities were raised in relation to system elements (Table 2). Protection of ecologically valuable forest areas is challenging for managers, since this topic received the highest number of non-conformities (109, 13%). This is followed by public communication and conflict resolution which is directly related to transparency and social impacts (10%). Usage of too many or unsafe chemicals also appears to be problem, since almost 10% of the non-conformities have been raised in relation to this. Similar proportion of non-conformities has also been identified against fulfilling the requirements for workers safety and usage of



Table 1: Categories for classification of the non-conformities.

A	B	C	D
Forestry activities and silviculture	Forest ecology elements	Social and economic elements	Systems elements
1. Roads and skid trails	1. Soil and erosion	1. Communication and conflict resolution with stakeholders, neighbors and communities	1. Management plan and rate of harvest
2. Restoration	2. Aquatic and riparian areas	2. Special cultural sites	2. Environmental Impact Assessment (EIA)
3. Regeneration and reforestation	3. Threatened and endangered species	3. Worker wages and living conditions	3. Monitoring
4. Conversion to non-forest uses	4. Protected areas, reserves and HCVF	4. Worker safety	4. Inventory
5. Chemical use and garbage disposal	5. Woody debris, snags and legacy trees	5. Training (incl. contractors)	5. Mapping
6. Exotic species and pests	6. Landscape-level considerations	6. Illegal activities and trespassing	6. Chain of custody; trademark and group certification*
7. Fire; prescribed burning	7. Use of lesser known species; deciduous species	7. Compliance with national and international laws	
8. Clearcut use and size	8. Non-timber forest products (incl. recreation and hunting).	8. Profitability of operation	
9. Forest machinery and chain saws		9. Long-term tenure	

*This category (D6) includes formal non-conformities which are not related to forestry practices, such as sales documents formulation, usage of FSC trademarks and administrative management of group certificate members.

personal protection equipment. The broad system categories of monitoring and forest management plan (including the rate of harvest) are followed by lack of sufficient training. About 5% of the non-conformities are related to insufficient protection of threatened and endangered species. Environmental concerns, such as damage to, or removal of, forest elements vital for sustaining healthy forest ecosystem, are most common among the remaining topics with over 20 raised non-conformities. As seen, the main challenges in meeting sustainable forest management practices are related with environmental and social aspects. The results suggest that high level of conformance exists among certified operations in Europe in relation to not converting forest areas and land tenure and ownership issues.

Regional comparison between Eastern and Western Europe reveals some interesting differences. The most significant difference by and large was related to threatened and endangered species. 73% of the non-conformities in this topic were raised in Eastern Europe. Significant shortcomings in the inventory of the species habitats as well as actual protection of the known habitats were identified by auditors. 73% of the non-conformities in relation to forest machinery and



Table 2: Number of non-conformities in each topic and region.

Category	CEE	WE	Total	Category	CEE	WE	Total
A1. Roads and skid trails	5	1	6	B8. Non-timber forest products (incl recreation and hunting)	2	9	11
A2. Restoration	1	0	1	C1. Communication and conflict resolution with stakeholders, neighbors and communities	51	36	87
A3. Regeneration and reforestation	8	8	16	C2. Special cultural sites	6	5	11
A4. Conversion to non-forest uses	0	1	1	C3. Worker wages and living conditions	3	6	9
A5. Chemical use and garbage disposal	42	35	77	C4. Worker safety	43	31	74
A6. Exotic species and pests	4	1	5	C5. Training (incl contractors)	22	29	51
A7. Fire; prescribed burning	0	4	4	C6. Illegal activities and trespassing	2	3	5
A8. Clearcut use and size	6	6	12	C7. Compliance with national and international laws	15	8	23
A9. Forest machinery and chain saws	16	6	22	C8. Profitability of operation	6	11	17
B1. Soil and erosion	8	14	22	C9. Long-term tenure	1	1	2
B2. Aquatic and riparian areas	12	11	23	D1. Management plan and rate of harvest	22	34	56
B3. Threatened and endangered species	37	14	51	D2. Environmental Impact Assessment (EIA)	21	8	29
B4. Protected areas, reserves and HCVF	57	52	109	D3. Monitoring	30	28	58
B5. Woody debris, snags and legacy trees	17	17	34	D4. Inventory	1	2	3
B6. Landscape-level considerations	3	7	10	D5. Mapping	7	4	11
B7. Use of lesser known species; deciduous species	0	9	9				

*Categories which were included in the regional comparison are indicated in bold typeface.

chain saw maintenance were also raised in Eastern Europe. Environmental impact assessment (EIA), which is somewhat novel concept in forestry, appears much more difficult to adopt in Eastern Europe since 72% of the non-conformities in relation to this system element were raised there. Compliance with legislation is also more challenging in Eastern Europe (65% raised in Eastern Europe). An analysis of the non-conformities under this topic indicates that all of the non-conformities related to awareness about international conventions were raised in Eastern Europe. Compliance with workers safety requirements and stakeholder consultation was also lower in Eastern Europe (60%). In Western Europe there were more non-conformities raised in relation to management plan and training (about 60%). 64% of non-conformities in relation to soil damage and erosion were raised in Western Europe.

4.2 Division of non-conformities within the categories

More non-conformities were raised regarding chemical usage and disposal (77) than for all the other topics in category together (Figure 1). FSC requires operations to minimize chemical usage and also bans usage of certain hazardous chemicals. 28 out of 77 non-conformities were direct result of the operations using chemicals banned by FSC. The other area of common violations is related to proper equipment and maintenance of forest machinery and chain saws. Mostly the FSC requirements here are related to minimizing negative environmental impacts. For example 8 non-conformities were related to lack of oil absorbents in machinery and several others were raised for not using biodegradable oil in hydraulics or as chain saw oil. In other cases leakage of oil was observed. Usage of too narrow spectrum of species, lack of sufficient tending of young stands and insufficient usage of natural regeneration stand out in relation to regeneration. In conclusion the most common non-conformities even in this category are related to maintaining or avoiding damage to the



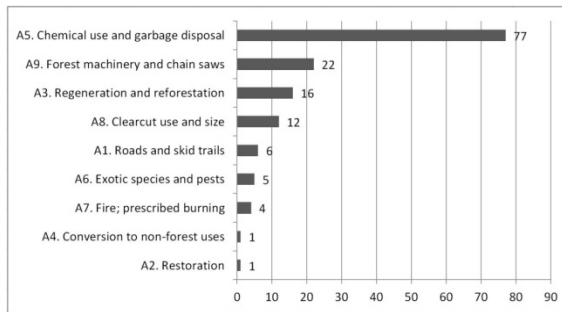


Figure 1: Number of non-conformities raised in category A.

ecological functions of forests (avoiding hazardous chemicals, minimizing negative impacts of forest machinery; using wide variety of species and natural regeneration).

Problems identified in relation to protected areas can be classified into: a) lack of sufficient initiative to designate areas for protection; b) lack of implementing sufficient protection measures (Figure 2). The latter is related to insufficient monitoring or conducting harmful management activities in the protected areas. Non-conformities related to threatened and endangered species include similar types of violations: most commonly lack of species or their habitat inventories, followed by lack of proper protection. The next three topics are related to maintaining the ecological values and functions of forest ecosystem by avoiding damage to special forest features or elements. B5 addresses ecologically valuable woody parts such as standing trunks, deadwood; biodiversity trees. B2 focuses on water related features and B1 on soil. In almost all cases the raised non-conformities are targeting removal (mainly in case of woody elements) or damage to (soil and special water related areas) the elements.

The majority of the non-conformities raised under C1 are direct result of missing or insufficient stakeholder communication by forest management operation (Figure 3). Lack of compliance with worker safety requirements has also resulted in high share of non-conformities. The non-conformities related to

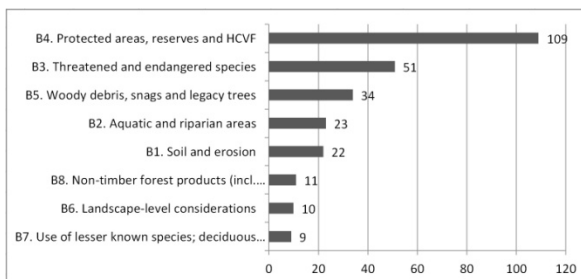


Figure 2: Number of non-conformities raised in category B.



Figure 3: Number of non-conformities raised in category C.

safety can be classified broadly into direct lack of required personal protection equipment and system level non-conformities such as inadequate safety training.

5 Discussion and conclusions

Results reveal the broad scope of impacts, that certification has had on promoting sustainable forest management in Europe. Throughout we can see stronger focus on ecological and social aspects, rather than economic or silvicultural issues. This is probably a good sign, since sustainable forestry brings these issues in the central focus. Empirical data from certification reports proves that that certification is requiring very specific improvements from the managers. We found non-conformities requiring the share of protected areas to be increased; making specific information publicly available; pro-actively conducting stakeholder consultation; conducting an inventory of high conservation value forests; stopping usage of certain dangerous chemicals; reducing the volume of used chemicals; leaving ecological elements (such as deadwood, biodiversity trees) on felling sites; providing safety equipment for forest workers etc. These are attainable and objectively measurable requirements and we believe positive changes are happening in relation to these aspects in the certified operations.

The two areas where certification is having most significant impact are addressing better protection of environmental values and importance of social interactions between foresters and stakeholders. Despite the EU wide process of Natura 2000 areas, we see that more action is required to protect the ecological values of European forests. 160 non-conformities were raised because valuable forest areas or species were not being properly protected. Considering these results, one can question also the enforcement of governmental instruments for biodiversity protection. On social side, there still appears to be significant gap between the sustainable forestry expectations and actual practices in relation to ensuring transparency and public availability of information. In 21st century Europe, forests are recognized as being public goods. Yet the results raise a question, if existing legal framework ensures sufficient public access to the information, which enables to truly adopt this principle. We recognize that FSC

is the forestry standard with highest focus on stakeholder communication and transparency, hence not everybody may agree to the wide scale application of the bar, FSC certified operations are being measured against. Still, we believe it is a question to consider by public policy makers as well. Several case studies have indicated that one of the most significant benefits of certification has been its ability to foster open and transparent communication between stakeholders [28, 29].

Having looked at the areas where certification does have a positive impact on promoting sustainable forest management, we also have to question the areas where surprisingly little evidence exists for push towards positive change. The key area of concern for us is the sustainability of felling volumes, which is of central importance in sustainable forest management. Out of the 1000 non-conformities only 3 were targeting sustainable felling volumes. It seems unlikely that in almost all cases the felling volumes are fully sustainable.

The regional comparison of results indicates that Eastern European forest managers in general have longer road to travel in reaching sustainable forestry. It appears biodiversity considerations are less rooted in the daily practice in Eastern Europe, where significantly more non-conformities have been raised in relation to inventory and monitoring, while in Western Europe the non-conformities are related mainly to ensuring protection of known areas/species. This indicates that while Western European countries struggle to ensure protection of the identified areas, the Eastern Europe is still having problems identifying these areas in the first place. Environmental practices, such as environmental impact assessment are more novel and unknown to Eastern European forest managers. Usage or hazardous, banned chemicals is more common-place in Eastern Europe, while the process of replacement of such chemicals seems to have been faster in more developed and economically better off Western-European countries. On social side, results suggest a generally lower level of transparency and public communication in Eastern Europe. It should also be considered that in Eastern Europe there are more public sector certificate holders, which strengthens the concern over transparency even further. Providing proper personal protection equipment also appears less rooted in daily practices in East Europe. Similar performance gap was noticed in relation to forest machinery, which allows claiming that machinery in Western Europe is generally newer and better equipped to avoid environmental damage. In Western Europe more non-conformities were raised in relation to formal issues such as trademark use and other system elements, less related to field performance. From these collective results we conclude that certification is playing more significant role in Eastern Europe in promoting sustainable forest management.

The study has demonstrated the potential of forest certification to assist in implementing and enforcing sustainable forest management in Europe. Areas with largest gaps between existing practices and sustainable forestry requirements provide valuable information to improve other existing tools on sustainable forestry. The area where very few non-conformities have been identified and where standard is unclear, can be used as input for improving further the certification systems. As other authors, we conclude that the impacts



of certification are more significant in regions with lower level of base performance (in Eastern Europe in this case).

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