FEDERATION OF
NORDIC FOREST OWNERS' ORGANISATIONS

EFFECTIVENESS AND EFFICIENCY OF FSC AND PEFC FOREST CERTIFICATION ON PILOT AREAS IN NORDIC COUNTRIES

Final Report

Savcor Indufor Oy,
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ABBREVIATIONS AND ACRONYMS

%	per cent
a	year
AT	Adger-Telemark
C&I	Criteria and Indicators
EC	European Commission
ENGO	environmental non-governmental organisations
EU	European Union
EUR	Euro
FA	Forest Act
FFCS	Finnish Forest Certification System
FMU	forest management unit
FSC	Forest Stewardship Council
GDP	gross domestic product
GMO	gene modified organisms
ha	hectare(s)
ILO	International Labour Organization
ISO	International Organization for Standardization
LEP	Landscape ecological planning
LFS	Living Forest Standard
LRF	LRF Forest Owners (Lantbrukarnas Riksförbund)
m	meter(s)
m^3	cubic meter(s)
MCPFE	Ministerial Conferences on the Protection of Forests in Europe
Metla	Forest Research Institute, Finland
Metsähallitus	State forestry organisation, Finland
MiS	Method to assess biologically valuable habitats in Norway
MTK	Central Union of Agricultural Producers and Forest Owners
NBF	National Board of Forestry
NC	non-conformities
NCA	Nature Conservation Act
NGO	non-governmental organization
NIJOS	The Norwegian Institute of Land Inventory (Norsk institutt for jord- og skogkartlegging)
NINA	Norwegian Environmental Research Institute
NSF	Federation of Nordic Forest Owners' Organisations (Nordens Skogägar-organisationers Förbund)
NSF	Norwegian Forest Owners' Association (Norske Skogseier förening)
P&C	Principles and Criteria
PCI	Principles, Criteria and Indicators
PEFC	Programme for the Endorsement of Forest Certification Schemes
PEOLG	Pan European Operational Level Guidelines
SFAB	Skogssällskapet Förvaltning AB
SFM	Sustainable forest management
SGS	Société Général de Surveillance
SMS	Finnish Forest Certification Standard (Suomen metsäsertifiointistandardi)
UNCED	United Nations Conference on Environment and Development
WHO	World Health Organization
WWF	The global conservation organization

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EXECUTIVE SUMMARY

1 INTRODUCTION

The debate on the impacts of Programme for the Endorsement of Forest Certification Schemes (PEFC) and Forest Stewardship Council (FSC)-based forest certification on forest has provided little information on the incremental impact of certification on sustainable forest management (SFM) or on the efficiency of certification especially in forests dominated with non-industrial private ownership. Cost-efficiency, market access, or other benefits strongly influence forest owners' motivation to voluntarily apply for certification, but so far the existing systems have not been analysed from these perspectives. Such information was deemed useful in order to further develop forest certification as an instrument to promote SFM and increased use of the renewable wood resources.

The specific objectives of the study were to:

1. Analyse the impact of certification on SFM in private forestry, taking into account the particular conditions prevailing in Nordic countries.
2. Evaluate the effectiveness and cost-efficiency of various certification schemes.
3. Analyse factors that can encourage private forest owners to opt for forest certification, including market access of certified roundwood.

2 SCOPE AND METHODS

The study compared the differences in effectiveness and efficiency on SFM between FSC and PEFC-based forest certification schemes and standards implemented in Finland, Sweden and Norway. The comparison was made in a selected pilot region representing typical conditions in each country (Table 1). The study did not attempt any ranking of certification standards or schemes between the countries.

Table 1 Pilot Areas and Assessed Forest Certification Schemes

Pilot Area	Forest Certification Schemes and Standards
Pirkanmaa region, Finland	1. Finnish Forest Certification System (FFCS) • SMS 1002-1 standard (1998) 2. Finnish Draft for FSC Standard • Draft 24 November 2004
Gävleborg County, Sweden	1. Standard for PEFC Sweden (2000) 2. Swedish FSC standard (1998, 2000)
Adger-Telemark region, Norway	1. Living Forest standards (2000) 2. SGS Interim local FSC standard (2001)*

** SGS Qualifor Programme (2001)*

The approach was based on the

(i) breakdown of the forest areas certified under the different schemes
(ii) analysis of performance requirements for PEFC and FSC certified forest management
(iii) impact of forest certification in promoting sustainable forest management

National legislation on property rights, forest and environmental management and labour relations was taken as a baseline in each country. As national legislations vary in scope and performance level between the countries, baselines are somewhat different for each country. In general, FSC standards that follow the predetermined structure are more detailed and repeat the normative regulations to a greater extent than the PEFC standards, which are build on the national normative framework of each member country. Conformity to national legislation is a baseline in both systems.

Certified forest area and incremental requirements of forest certification standards define the effectiveness of forest certification in promotion of SFM. Efficiency was analysed through costs and benefits generated in forest certification and marketing of certified forest products.

The study plan, analysing methods and draft conclusions were reviewed by an independent reviewer highly competent in forest management research and with extensive experience in tropical forestry and implementation of forest certification within FSC and PEFC frameworks. The given remarks were taken into consideration throughout the work.

3 IMPACTS OF FOREST CERTIFICATION

Both PEFC and FSC-based forest certification have enhanced sustainable forest management and levelled out differences between the Nordic countries, independent of the requirements imposed by national legislation. Both systems put stronger emphasis on ecological sustainability than on social and economic aspects. Differences in the implementation of environmental, social or economic requirements of the two systems in practical forestry were not significant in any of the pilot regions. Therefore the impact of forest certification in enhancing forest management depends largely on the certified forest area. PEFC-based schemes were more effective in non-industrial private forests whereas FSC had significance in industrial forestry in Gävleborg County.

One of the main results of the study was that the forest certification levelled out differences between the Nordic countries, independent of the requirements imposed by national legislation. In general, FSC standards that follow the predetermined structure are more detailed and repeat the normative regulations to a greater extent than the PEFC standards. For this reason forest certification standards cannot be compared without taking into consideration the national normative framework.

As regards social sustainability the Common Law on Free Access to Forests and common practices outline the recreational use of forests in a generally satisfactory way. The main concern in the Nordic countries is to maintain income and employment opportunities generated by the forestry sector which is crucial for the socio-economic development of rural communities. Only economically viable forest management provides employment opportunities and income to the rural people and can maintain social and economic services in rural communities. The contribution of certification alone to social or economic sustainability in the Nordic country conditions has been less pronounced than to protection of environment.

In biodiversity conservation the main differences between the PEFC and FSC-based standards are due to the different requirements regarding set-aside areas. FSC requires a blanket 5% set-aside area whereas the approach in the PEFC standards tends to protect valuable habitats if

present in the forest. At a regional level, this has led to comparable levels of set-aside areas, whereas the differences are larger in individual forest holdings.

In large-scale industrial forestry, set-aside areas can be planned to maintain high conservation values. In small-scale private forestry a blanket quota for set-aside areas was not considered an effective tool compared to landscaped-level measures.

Requirements for the extent of set-aside areas are the main reasons for additional cost due to certification. The harvesting restrictions imposed by certification standards can decrease the stumpage revenues up to 15-20% having a major impact on the economy of a private forest owner. In individual certification, audit costs can be a critical cost barrier but in large-scale certifications their role is marginal. Group certification arrangements have kept these costs reasonable to the small-scale non-industrial forest owners.

4 PARTICIPATION OF PRIVATE NON-INDUSTRIAL FOREST OWNERS

Private non-industrial forests were the dominating ownership forms in Prikanmaa, and Adger-Telemark regions and their share reached also 43% in the Gävleborg County (Figure 1). The average size of these forest holdings varied from 23 to 70 hectares but yet stable timber supply from these forests is crucial for the timber processing industry.

Private non-industrial forest owners have viewed forest certification as an essential element in providing assurance on SFM for buyers of forest products. Certification has been a significant investment by forest owners but it has not brought significant economic benefits to them.

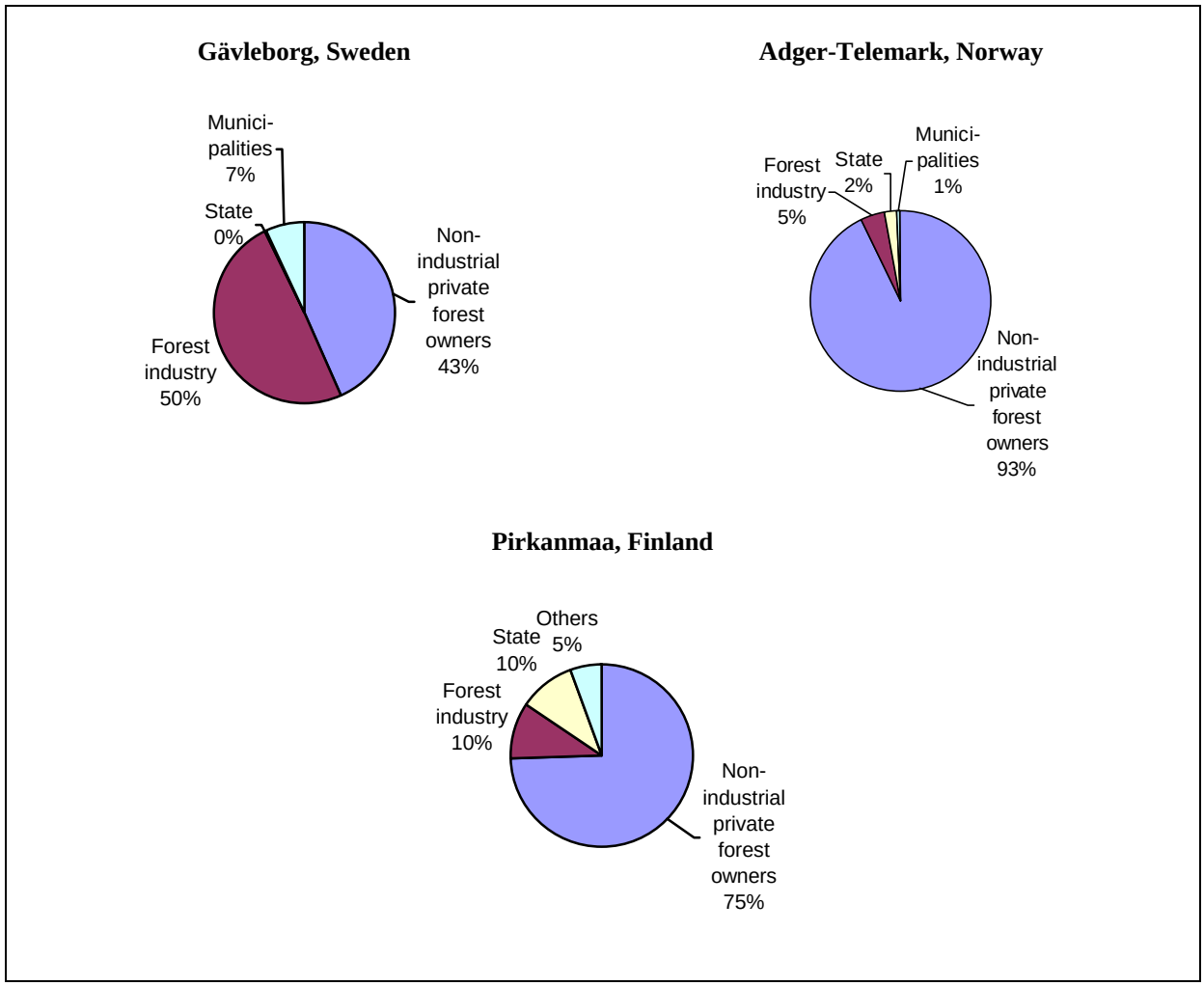
In all the three countries the forest owners' organisations have made a major effort in contributing to the development of national certification systems that would be accessible for individual forest owners. The following common aspects have contributed to the acceptance of forest certification among them:

(1) Cost-efficient group certification arrangements, drawing on existing regional-level forest owners' organisations, have encouraged forest owners to participate in certification. If the decision on participation is made in connection with regular communication between the owner and his organisation, certification becomes easily acceptable. Written commitments have been made separately or confirmed in writing when timber sales contracts are signed.

    Fewer private non-industrial forest owners have joined group certifications arranged by other organisations, e.g. forest industry. These options are more attractive to institutional forest owners.

    Auditing costs, although marginal compared to the total costs of certification, can represent a critical cost barrier to individual forest owners. Requirements for significant losses in stumpage revenues through harvesting restrictions due to certification requirements have decreased the willingness to any certification.

Figure 1 Forest Ownership in Pilot Regions



(2) Forest owners need to be well informed on the implications of certification. Their organisations have succeeded in communicating on the benefits and responsibilities related to certification. This has involved extensive training and information campaigns and individual discussions. There is a continuous need to inform and train forest owners and contractors on certification, which is best done by forest owners' organisations in the Nordic conditions.

(3) Certification rate among forest owners significantly increases if market demand is strong. In Adger-Telemark, where only certified timber is traded, practically all forest owners involved in timber trade have certified their forests. In Gävleborg County, where such direct demand is less pronounced, the certification rate among private owners is substantially lower, also when compared to other active forest owners organisations in Sweden (e.g. SÖDRA). In Pirkanmaa the promotion of certification was adopted as a major market challenge by all the involved actors, which led to a similar level of participation to that in Norway.

Only market demand from forest industry can significantly increase the take-up of forest certification among private forest owners in the long run. This demand is also important for forest owners' organisations to justify their inputs to certification. From the owners' point of view, the industry should promote marketing of certified products to a much greater extent than at present.

(4) A price premium for certified timber is an effective tool to encourage forest owners' participation. In Norway and Sweden timber trading organisations and forest industry have paid price premiums with good results. In the Finnish regional certification the forest owners' participation could be ensured without premiums through an effective regional certification arrangement. Forest owners' organisations and sawmill industry linked to private forestry have been more positive towards price premiums than large-scale pulp and paper industry apparently because of different market requirements.

1 INTRODUCTION

1.1 Background

Convention on Biodiversity drafted in the United Nations Conference on Environment and Development (UNCED) Conference in Rio de Janeiro in 1992 brought the biodiversity protection in forest ecosystem to the official agenda. It was evident that national forest authorities alone could not stop the forest destruction, which called for other innovative and market driven tools to protect world's forest resources. Voluntary forest certification was developed to enhance sustainable management of forests and control on the origin of wood material in forest products.

The scope and content for sustainable forest management (SFM) were defined in regional intergovernmental processes that established the criteria and indicators for SFM at a regional level. The Ministerial Conferences on the Protection of Forests in Europe (MCPFE) drafted Pan European Criteria and Indicators for SFM to guide the national level monitoring and reporting in the European forests. Parallel processes produced the criteria and indicators for other geographic regions. The intergovernmental processes aimed at enhancing cross-sectoral data collection and providing information for forest policy development at national and European levels. The Pan European Operational Level Guidelines (PEOLG) translate the international level commitments down to the forest management unit (FMU) level planning and practices. The voluntary PEOLG provide complementary actions that further contribute to the sustainability of forest management.

Principles and criteria for voluntary forest certification were first published by Forest Stewardship Council (FSC) in 1996. The non-governmental FSC is strongly influenced by environmental non-governmental organisations (ENGO). Its organisation and certification framework is guided by the rules allow only limited national variation between standards and their implementation. The quoted, three-chamber-based decision-making system restricted the decision-making power of non-industrial forest owners to the level that they could not agree upon.

Together with other European level stakeholders European forest owners' organisations established an alternative forest certification system that would better take into account the specific characteristics of forest management in different countries. In 1998 the PEFC framework (currently the Programme for the Endorsement of Forest Certification Schemes) emerged adopting the intergovernmental PEOLG as the baseline for SFM.

Forest owners' organisations phased the challenge to elaborate certification arrangements that would attract a large number of owners for small forest enterprises covering in average about 30 to 70 ha each. An effective and cost efficient certification system was therefore necessary. Sweden and Norway developed group certification models adapted to the national private sector forestry organisations and their timber trading activities. In Finland, a regional certification model was introduced where all ownership groups in a region could participate in group certification.

Although forest certification is well operational in all the Nordic countries, ENGOs and some market segments have questioned the sustainability in certified forestry. ENGOs have actively campaigned for their own concept of SFM and built up networks with buyers of forest

products to promote the FSC system. The debate and demands have focused on the Nordic timber producing countries, Finland, Sweden and Norway, which have frequently been accused to practice poor forest management. Sannes (2003) has observed that in the 1990s the influence on how the forests should be managed was partly transferred from the democratic governments to ENGOs, global forest industry companies and customers that expressed market demands for certified forest products. This happened at the expense of the family forestry and local ENGOs. Small forest holdings found themselves underrepresented in the international context and also the authorities' influence on forest management was reduced due to the voluntary certification, being a tool outside the public control. Also the growing importance of plantation forestry in global supply of fibre has weakened the position of small-scale private forestry and the Nordic multiple use model of forest use.

1.2 Forest Certification in the Nordic Pilot Countries

All the Nordic countries are highly dependent on the timber produced in the in private non-industrial forests but yet they chose different strategies to meet the demand for certified forest products. In Sweden interest groups made commitments to either PEFC or, FSC in an early stage and national standards for the both systems were developed. Forest owners' organisations were strongly committed to the PEFC but the industry was more open to both systems. Later there has been extensive communication and harmonisation between the two processes. In practice double certification that meets the requirements of both FSC and PEFC standards is common in the industry-owned forests in Sweden. However, it has not been an attractive option for small-scale forest enterprises.

Forest industry in Finland and Norway depend more on the timber supply from private forests than in Sweden and in these two countries the PEFC system has become dominant. Both countries have only marginal FSC-certified areas and the national standard development processes under FSC has been very slow.

In Norway an extensive national "Living Forest" process was launched already in 1995 to define the content and procedures for SFM in Norway. The certification system, including the national standards for SFM, was developed as part of the process and it was endorsed by the PEFC Council in 2000.

Forest certification was introduced only eleven years ago. The first certifications in Sweden, Norway and Finland were made in 1998, 1998 and in 1999. Even though the time period is relatively short it allows making preliminary conclusions on how effective certification has been in the Nordic countries.

1.3 Study Objectives

The continuous debate on the quality and impacts of PEFC and FSC-based forest certification on forest management in Nordic countries has been based on comparisons of the latest technical documents of the different systems and on individual perceptions. Less information has been available on the incremental impact of certification on SFM or on efficiency between the resource inputs and outputs in certification. The purpose of this study is to address this lacuna and to make a basic assessment on the effectiveness of forest certification

as a tool to promote SFM in forests dominated with non-industrial, private ownership. Cost-efficiency, market access, or other benefits are aspects that strongly influence forest owners' motivation to apply voluntarily for certification, but so far the existing systems have not been analysed from this perspective.

The forestry sectors in the Nordic countries have made large investments in SFM and forest certification during the past ten years. The accumulated experience and strongly developed legislative and institutional frameworks provide an excellent basis for the assessment of the effectiveness and efficiency of PEFC and FSC based certification within the three countries. Forest owners and other stakeholders should be well informed on the impacts of PEFC and FSC-based certification on SFM and the costs and benefits derived from certification.

The specific objectives of the project were to:

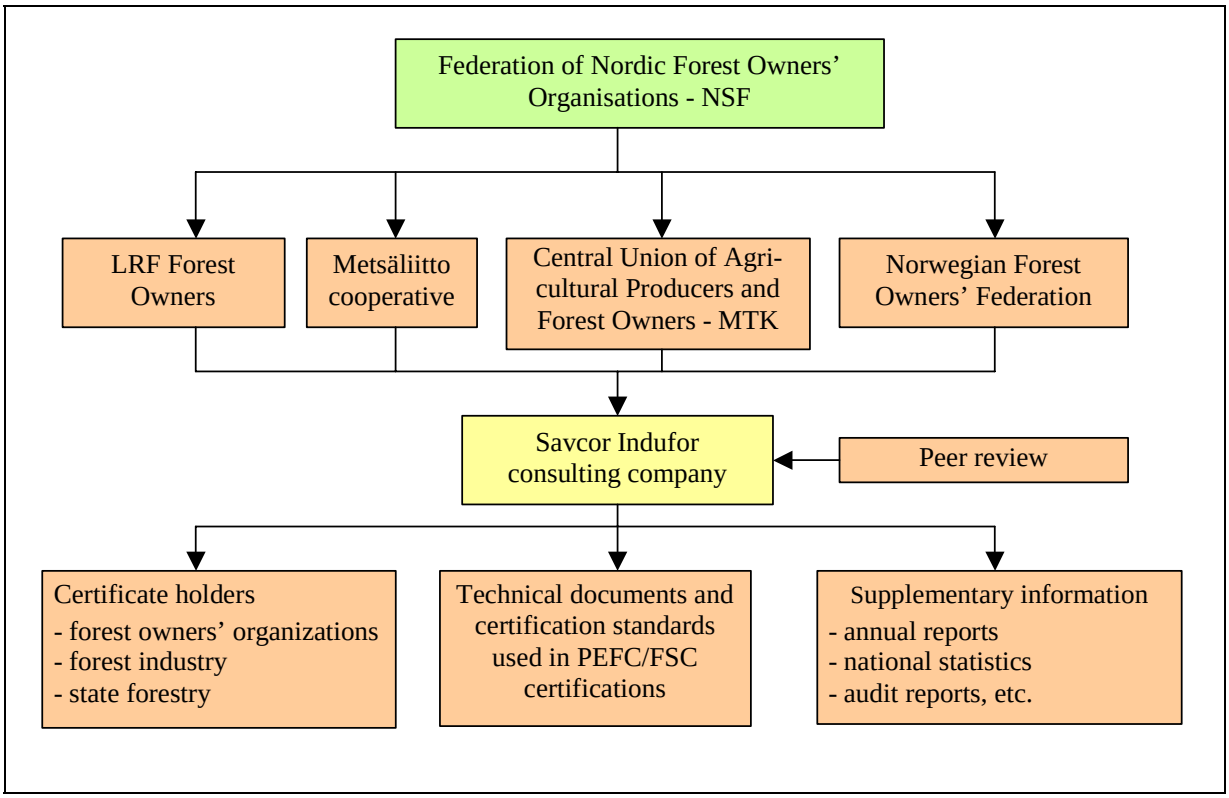
(1) Analyse the impact of certification on sustainable forest management in Nordic private forestry, taking into account the particular conditions prevailing in different countries.
(2) Assess the breakdown of the forest areas certified under the different schemes and examine the impact on promoting sustainable forest management.
(3) Evaluate the cost-effectiveness of each scheme for the parties involved.
(4) Consider the wood price implications in the certified round wood markets.
(5) Assess the aspects related to different schemes that encourage private forest owners to opt for forest certification.

1.4 Organisation of Work

Federation of Nordic Forest Owners' Organisations (NSF – Nordens Skogägarorganisationers Förbund) commissioned consulting company Savcor Indufor Oy to plan and implement the study. In data collection assistance was received from the LRF Forest Owners (LRF – Lantbrukarnas Riksförbund), Norwegian Forest Owners' Federation (Norges skogeierföreningen), Central Union of Agricultural Producers and Forest Owners (MTK), as well as forest industry and other stakeholders involved in forest certification.

Data collection was based on questionnaires sent to PEFC and FSC certified organisations in the three selected pilot areas. Interviews with applicants and representatives from forestry authorities and technical documentation on schemes and audits provided additional information for the analysis. The study approach was to review from the applicant's viewpoint the implications of voluntary forest certification on forest management when the normative regulations were considered as a baseline in forest management. The organisation of the work is presented in Figure 1.1.

Figure 1.1 Organisation of the Work



2 METHODS

2.1 Comparative Framework

The purpose of this study is to assess *effectiveness* and *efficiency* of FSC and PEFC-based forest certification as a practical tool to promote SFM in the Nordic countries characterised by private non-industrial forestry (Figure 2.1).

Effectiveness of forest certification is defined through its impacts in practical forest management. The key elements of the assessment are

(a) incremental requirements of the certification standards compared to the legislative baseline, and
(b) the area on which the standard is implemented.

The study assesses the differences in impacts on SFM between FSC and PEFC-based forest certification schemes and standards implemented in Finland, Sweden and Norway (Table 2.1). The FSC-PEFC comparison is made within each country based on the standards in use in 2004. The study does not attempt any ranking of schemes between the countries. The study does not cover the criteria on indigenous people and reindeer herding as these issues were not relevant to the three pilot regions.

The Finnish Forest Certification Standards (SMS) and the Swedish PEFC standard went through the periodic revisions in 2003-2004. The revised Swedish PEFC standard is fully

compatible with the national FSC standard endorsed in 1998. Also the National FSC standard is due to periodic revision. Norwegian Living Forest Standard was also due to revision in 2005. The interim FSC standard in Norway is updated by the certification body.

Figure 2.1 Framework of Analysis

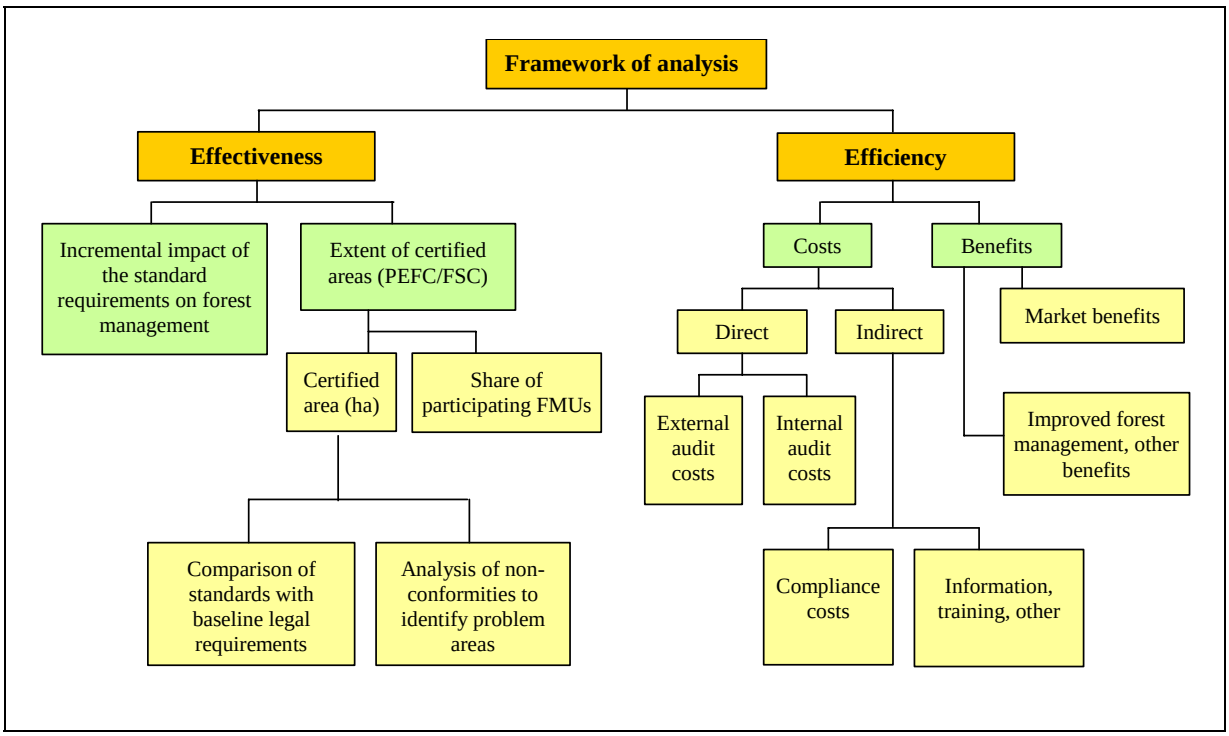


Table 2.1 Assessed Forest Certification Schemes and Standards

PEFC Endorsed Schemes	FSC Standards
Finnish Forest Certification System - SMS 1002-1 standard (1998)	Finnish Draft for FSC Standard - Draft 24 November 2004
Swedish PEFC - Standard for PEFC Sweden (2000)	Swedish FSC standard - Published 1998; updated 2000
Living Forest Standard - Norway, 2000	Interim local FSC standard - Based on FSC P&C, Living Forest Standard, Swedish FSC Standard (*)

(*) SGS Qualifor…2001

2.2 Assessment of Effectiveness in Implementation of Forest Certification

Effectiveness of forest certification in different countries is defined as the contribution of achieving the SFM objective. An additional concept is *efficiency*, which is defined as the relation between outputs and inputs, often assessed at given levels of performance. In this study, we have used the following different approaches to assess effectiveness and efficiency.

(i) Comparison of performance requirements for the forest manager in FSC and PEFC Standards with normative framework in a country.
(ii) Extent and spatial distribution of certified forests.

The requirements in national PEFC and FSC standards are compared with the normative regulations in each country. The comparison focuses on the additional management system or performance requirements that the voluntary standards introduce to forest management.

The detailed assessment of performance requirements is based on

(i) the normative requirements, and
(ii) PEFC/FSC standard requirements for each country is presented in Annexes 1-3.

Analysis of performance requirements reveals to what extent performance in forest management has improved in certified forests compared to the baseline, i.e. the normative level set for forest management in a country. Public summaries of the audit reports have been used as a source of information on the practical implementation of the standard requirements. This information is used as an additional input when conclusions on the performance requirements in FSC and PEFC-based standards and certifications are drawn. They also provide an overview of the problem areas in the certified forest management.

The quantitative analysis on the certified forests was done through listing the extent of the area of certified forests taking into consideration the share and accessibility of non-industrial private forest owners to certification.

(a) In measuring effectiveness of forest certification it is important to understand how widely the standard-adapted forest management is practised in a country.

The experience has shown that in regions dominated by non-industrial private forest ownership the expansion of certified areas tends to be slow worldwide if the certification scheme does not provide specific means to address this hurdle. Any incentives and bottlenecks identified in the studied schemes will be assessed.

2.3 Assessment of Efficiency of the Outcome in Forest Certification

Efficiency is defined as the cost-benefit ratio of forest certification (Figure 2.1). However, comprehensive information on the incremental costs and benefits on forest certification in practical forest management and timber trade were not available. This study provides cost estimates based on the interview data and available studies and compares them to the certified area and timber production in the area. Benefits of forest certification are defined broadly including direct market benefits, better forest management but there are also other benefits such as improvements in forestry administration and management systems. Assessment of benefits is largely based on the views of interviewed parties.

In the assessment of efficiency two aspects are considered: (i) costs, and (ii) benefits.

2.3.1 Certification Costs

There are two types of costs that are caused by forest certification:

(i) Indirect costs:

- *Loss of stumpage revenues.* These can be considered as indirect costs caused by changes in forest management due to the standard requirements that exceed those of the law. They are caused mainly by various restrictions on harvesting.
- *Organisational costs.* These are mainly labour costs for awareness raising and training of forestry organisations, forest owners and contractors. In the forest industries and state forestry, on the other hand, the costs of certification training and internal auditing are usually not separated from other development inputs and, therefore, were not included in this calculation.

(ii) Direct costs:

- These are costs of direct payments to auditing and certification bodies as well as costs of internal auditing. External auditing costs include the certification body's fees. The internal audit includes only the costs reported by the applicant organisations.

Membership fees of national certification schemes are not included in the cost estimates.

Estimates of the direct and indirect costs are based on the available studies in the Nordic countries (Nuolivirta 2004, Malmi 2000, Simula et al 2004, Indufor 2000) and on the interviews made. In many organisations the indirect certification costs are included in the general management costs and detailed information was therefore not available. In these cases estimates that were based e.g. on average time consumption and hourly rates were used for the cost analysis.

2.3.2 Benefits

The benefits are measured in monetary and non-monetary terms. For forest owners financial benefits from market access or price premiums can be a driving force for certification if they exceed the respective costs. Certification may also provide an efficient tool to implement and monitor the environmental and social elements of sustainable forest management. Especially authorities have appreciated this dimension of forest certification.

In this study the benefits were evaluated from the following viewpoints:

(i) Improvements in forest management through the implementation of environmental, social and economic requirements in the FSC and PEFC standards
(ii) Extent and distribution of certified forests in the region (area where the standard is implemented)
(iii) Market benefits from certification (price premium, market access)

The points (i) and (ii) are elements contributing also to the effectiveness of forest certification. In addition to the incremental positive performance requirements on forest management the geographic distribution of certified forests is an essential element in defining the overall

ecological, social or economic benefits of forest certification. Efficiency and impact of forest certification remains insignificant if the standard is implemented in a very limited area or certified forests are scattered.

2.4 Reference Framework of Standards

The comparison of the FSC and PEFC-based standards was made in view of the elements of sustainable forest management defined in the Ministerial Conference on the Protection of Forests in Europe (MCPFE). The Conference adopted the Pan-European Criteria and Quantitative Indicators for the Sustainable Management of European Forests in Geneva in 1994 and the indicators were further improved in Vienna 2002 (*www.mcpfe.org*). These Criteria and Indicators (C&I) provide a broadly accepted reference framework, which can be used for assessing the content of individual certification standards.

The assessment focuses on quantitative indicators. The qualitative indicators mostly address the policy level, institutional structures and resource allocation at a national level whereas forest certification focuses on decision-making on the forest management unit level. Forest owner/manager cannot usually have a direct influence on the conformity to national level criteria and indicators and it is not justified that certification standards include any such requirements. Forest certification criteria and indicators should focus on those aspects of forest management that are under the decision making power of a forest owners/managers.

The following elements established the reference framework for the comparison of FSC and PEFC-based forest certification standards in each country (Table 2.2).

The national PEFC standards are closely linked with the Pan European C&I because they shall be fully compatible with the Pan European Operational Level Guidelines derived from the C&I. National standards often add requirements on issues needing special attention but in general the components listed in Table 2.2 cover the standard requirements.

FSC standards shall comply with the FSC Principles, Criteria (P&C). The above listed components largely cover also the FSC P&C although these give more specific consideration on e.g. gene modified organisms (GMO), delimitation of areas for restricted use/forest protection and consultation with local stakeholders. According to the FSC regulations a national or interim standard should have provisions for all the areas listed in the FSC P&C.

Table 2.2 Reference Basis of Sustainable Forest Management against which the National Systems Are Evaluated

Pan European Criterion	Components
1. Maintenance and appropriate enhancement of **forest resources** an their contribution to global carbon cycles	- land use and forest area - growing stock - carbon balance, wood energy
2. Maintenance of forest ecosystem **health and vitality**	- impact of air pollutants - wind damages - forest fires - insect and fungal damages - game and grazing damage
3. Maintenance and encouragement of **productive functions of forests** (wood and non-wood)	- wood production - balance of growth and harvesting - roundwood - non-wood goods - management plans
4. Maintenance, conservation and appropriate enhancement of **biological diversity** in forest ecosystems	- tree species composition - regeneration - naturalness (e.g., dead wood, age structure, patchiness of succession stages) - protected forests; rare ecosystems (habitats) - threatened species - landscape pattern
5. Maintenance and appropriate enhancement of **protective functions** in forest management (notably soil and water)	- protective forests: soil erosion, water conservation - protective forests: infrastructure, managed resources
6. Maintenance of **other socio-economic functions and conditions**	- economic significance of forests - customary rights and recreational services - workforce, occupational safety and health - public awareness and participation - cultural values

Source: MCPFE 1998, 2002

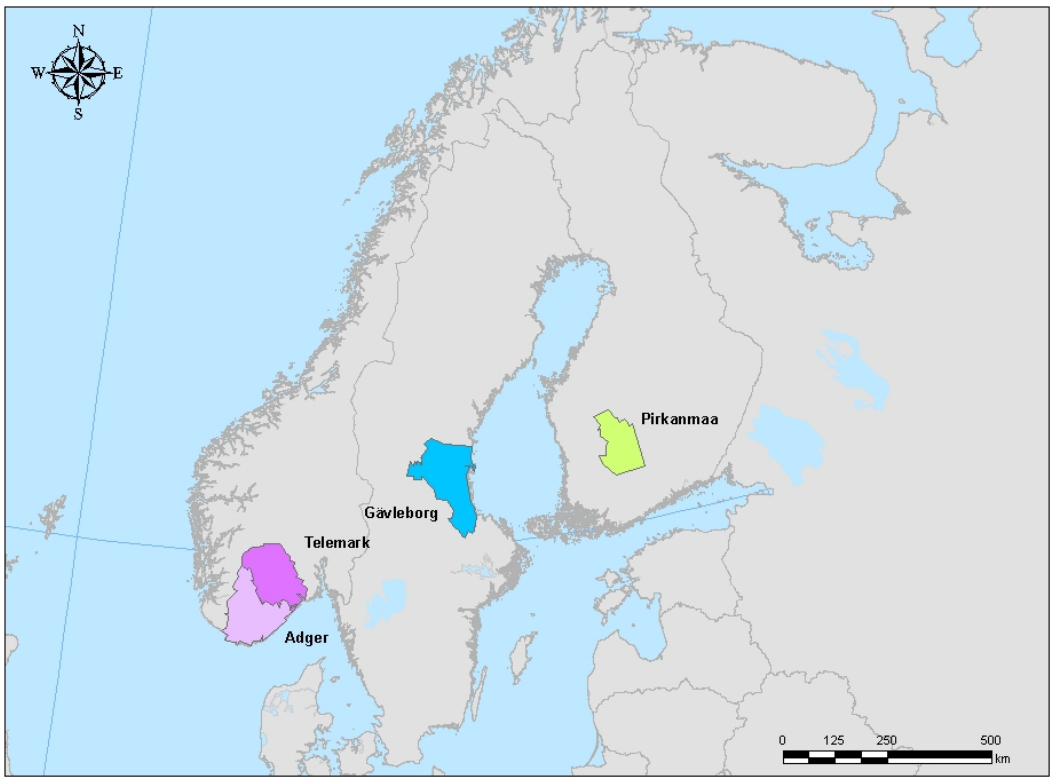
2.5 Pilot Areas

The study focuses on three pilot regions, one in each country (Figure 2.2). In all pilot regions forestry and forest industry are important for the regional economy. The ecological and socio-economic conditions are comparable between the three regions. All areas are dominated by small-scale non-industrial forest ownerships.

In Finland the pilot region is Pirkanmaa in Central Finland. Pirkanmaa has 0.94 million hectares of forestry land (76% of total land area). The share of private, non-industrial forests is 74%. The whole region was certified in 1999 according to the Finnish Forest Certification System. The applicant organisation was the Forest Owners' Union of Western Finland but the certificate covers also industrial and state forests in the region. The certification standard applied was SMS 1002-1 for Group Certification at the Level of the Forestry Centre's Area of Operations. The PEFC Council endorsed the Finnish Forest Certification System (FFCS) in

2000. There are no FSC certified forests in the Pirkanmaa region. The share of certified forests in the region is about 91% of forestry land[1].

Figure 2.2 Pilot Areas



In Sweden the pilot region is Gävleborg County in Central Sweden. The region has 1.67 million hectares of forestry land (75% of the land area). The share of the private, non-industrial forests is about 44%. The first FSC certificates in the region were issued in 1997 for Stora AB on conformity to an interim FSC standard. A year later the Swedish National FSC standard was endorsed and the subsequent certifications were made against that standard. Today, all forest industry companies in the region hold a FSC certificate and all, except Sveaskog, have also applied for a PEFC certificate. About 15-20% of non-industrial private forest owners are PEFC certified

The Norwegian pilot region is the geographic area of Agder Telemark Forest Owners' Association (AT Skog) in the southern part of the country. It covers a forest area of 1.47 million hectares (47% f the total land area). In 1998 AT Skog received the certificate for

[1] Forestry land includes (i) productive forest land, (ii) scrub land, (iii) waste land, and (iv) other, e.g. storage areas, forest roads, etc.

ISO 14001 environmental management system that also covers the conformity to the Living Forest (Levende Skog) standard. The PEFC Council endorsed the Living Forest certification system in 2000. The environmental management system requires that timber traded by the forest owners association shall be entirely certified.

The overall certified forest area in 2004 by PEFC and FSC schemes in the three Nordic countries and pilot regions is presented in Table 2.3. The results on effectiveness and efficiency of PEFC and FSC-based certifications in each country are presented in the end of each case study.

Table 2.3 Certified Forests in Pilot Countries and Regions

Country	National level		Pilot region		Total in pilot region
	FSC	PEFC	FSC	PEFC	
	1 000 ha				
Finland	0.093	25 200	0	1 000	1 000
Sweden	10 429	6 412	724	997	1 201
Norway	5.1	9 232	5.1	1 410	1 415

Sources: www.fsc.org, www.pefc.org, Interviews with Forest Owners' Union of Western Finland, Mellanskog, Skogssällskapet Förvaltning, Skogscertifiering Mellansverige, Bergvik Skog AB, Stora Enso AB, Korsnäs AB, Holmen Skog AB, Sveaskog AB in Sweden and Agder Telemark Forest Owners' Association in Norway

3 PIRKANMAA CASE STUDY, FINLAND

3.1 Baseline

In Finland forest management should aim at economically, ecologically and socially sustainable management and utilisation of the forests in such a way that the forests provide a sustainable satisfactory yield while their biological diversity is being maintained[2]. The National Forest Programme 2010 is drafted by national stakeholders to promote the implementation of forest policy. The protection of environmental values in forests will be ensured by (i) compilation of a network of representative protective areas, (ii) protection of small valuable biotopes, and (iii) integration of conservation principles in sustainable management of production forests.

The Forest Act (1996:1093) and the respective Forest Decree (1996:1200) set the basic requirements for the forest management in Finland. These norms regulate, among other, the following elements of forest management:

1. Regional level strategic planning (Sec 4)
2. Felling and regeneration of forests (Sec 5-9)
3. Safeguarding the diversity of forest nature
   - Preserving biological diversity and habitats of special importance, special permits (Sec 10-11)

[2] Forest Act (1093/1996) Section 1

4. Protection forests and protection zones (Sec 12-13)
   - Protection forests are established to protect timberline in Northern Finland
   - Protection zones protect settlements or cultivated areas highly exposed to wind, landslides, or other vulnerable areas
5. Forest use notification (Sec 14)
   - Submitted to the regional Forestry Centre prior to felling operations describing the planned felling and regeneration operations and consideration of habitats of special importance.

Forest managers shall also respect the relevant provisions set in the Nature Conservation Act (1996:1096) and the respective Decree (1997:160) covering:

1. Implications of a nature conservation programme (Sec 9)
2. Conservation of natural habitats (Sec 29-31)
3. Landscape conservation (Sec 32-35)
4. Protection provisions for species (Sec 39, 42, 47-49)
5. EU Natura 2000 Network (Sec 64-69)

Regarding forest management planning the forest legislation requires that regional strategic planning (Forest Management Target Programme) outlines objectives and development needs for timber production and forest use, biodiversity protection and employment generation in the forestry sector. The economic and environmental impacts of the programme shall be evaluated. The regulations do not require individual FMU level forest management plans that forest owners make always on a voluntary basis.

Forest owner has to notify the regional forestry centre before implementing any final or intermediate harvesting operations. The regional Forestry Centre can within two weeks time set restrictions for the operation or request further information. Regional Forestry Centres have therefore the possibility to intervene and control or even prevent harvesting operations if there is a risk that they are against the normative rules. The Forest Act requires prompt regeneration after regeneration felling. The planned regeneration methods shall also be described in the forest use notification. The regional Forestry Centre monitors the quality of regeneration in annual sample based reviews.

Protection of natural habitats is addressed both in the Forest Act and the Nature Conservation Act. The habitats of special importance listed in the Forest Act are identified for forest ecosystems whereas those listed in the Nature Conservation Act merely include non-forest habitats, cultural habitats or rare and specific wooded habitats (see Boxes 3.6 and 3.7). The qualification requirements for the habitat area are specified and special characteristics of all the listed habitats shall be preserved when operating in the proximity of such habitats. Regional Forestry Centres have mapped all the habitats of special importance preserved under the Forest Act and informed forest owners and forest management associations on their type and location. Regional environment centres carry out mapping of the habitats protected under the Nature Conservation Act.

Water Act and the EU Water Framework Directive 2000/60/EC set extensive provisions on water protection in forest management. Detailed regulations on water protection are issued, e.g. for draining operations for supplementary ditching. The Water Directive requires

improved protection of water ecosystems which set additional emphasis on water protection measures in all forest management.

The legislation relevant on forest management includes a broad range of laws and regulations that apply for specific activities (Box 3.1). Property rights, labour conditions, use of chemicals and waste management are well addressed in the specific legislation.

Box 3.1 Legislation Relevant in Forestry in Finland

Forest Act 1996:1093
Nature Conservation Act 1996:1096
Water Act 1961:264; to be revised in 2005; EU Water Framework Directive 2000/60/EC
Wilderness Act 1991:62
Act on Environmental Protection* 2000:86
Act on Environmental Impact Assessment 1994:468*
Act on Chemicals 1989:744
Act on Pesticides and Herbicides* 1969:327
Waste act 1993:1072
Act on the Financing of Sustainable Forestry 1996:1094
Act on the Prevention of Insect and Fungal Damages 1991:263*
Act on the Trade of Forest Reproductive Material 2002:241*
Act on Gene Technology 1995:377*
Hunting Act 1993:615*
Act on Reindeer Herding 1990:848*; several acts on the rights of Sami people
Act on Archaeological Remains 1963:295
Contracts of Employment Act 1970:320; Collective Agreements Act 1946:436
Act on Working Hours 1996:605*; Act on Work Safety 2002:738
Land-Use and Building Act 1999:132

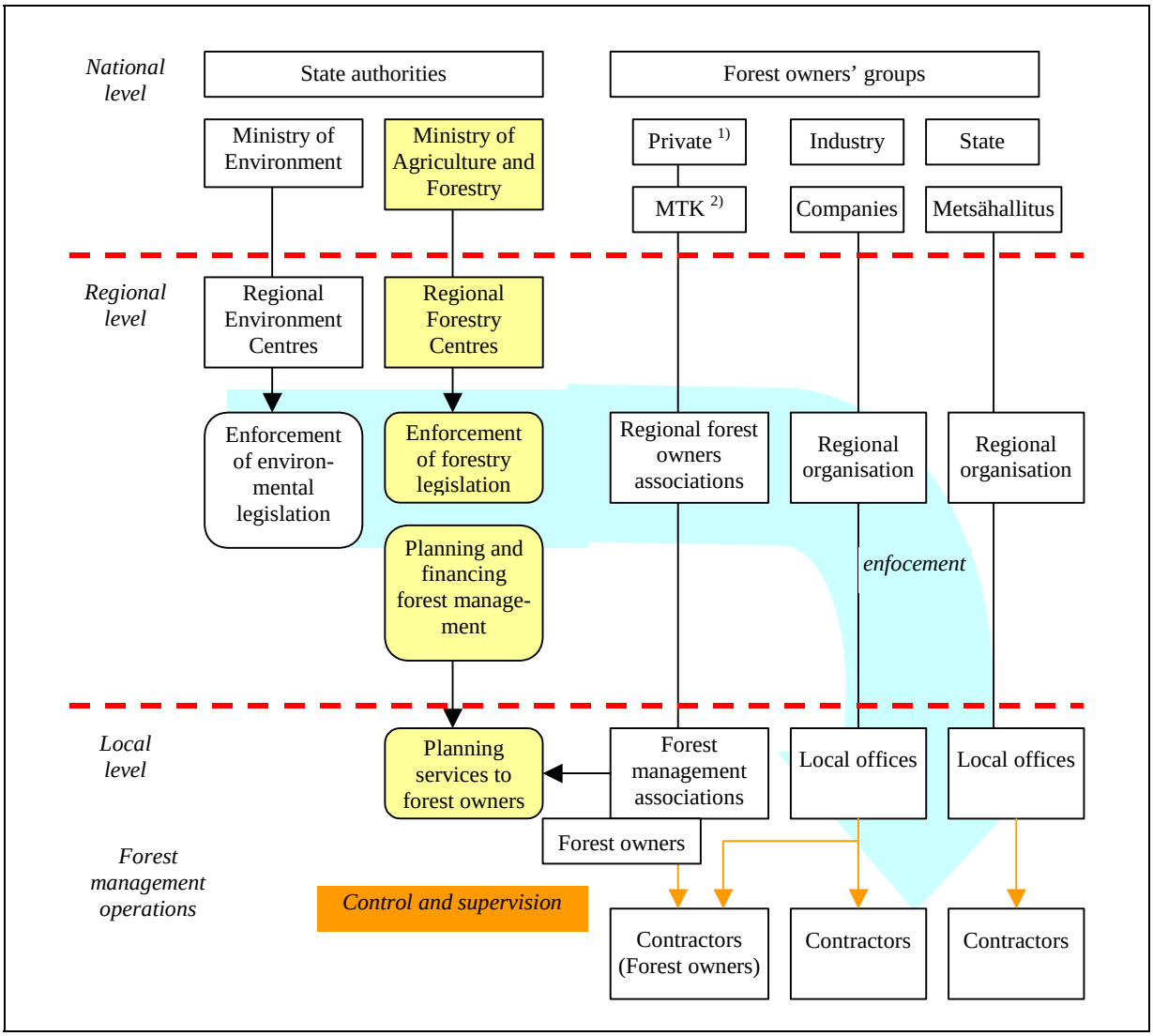
** Author's translation*

3.2 Forest Management System in Finland

In Finland forestry and forest legislation belongs to the responsibilities of the Ministry of Agriculture and Forestry. Regional Forestry Centres, in 13 regions, have separate departments for the enforcement of forest legislation and for the development of forestry in the region (Figure 3.1). The Forestry Centres control the conformity to legislation in all forest management in the region regardless of the ownership of a forest. Regional Forestry Centres prepare on the request of private forest owners a large share of FMU-level forest management plans.

Protected areas and legislation on environment, water protection, etc. are under the Ministry of Environment. At the regional level Environment Centres enforce the legislation and consult forest management organisations especially on issues related to draining, water protection and protection of threatened species in forestry.

Figure 3.1 Organisational Framework for National and Regional Forestry in Finland



1) Non-industrial private forest owners and single institutional owners
2) Central Union of Agricultural Producers and Forest Owners (MTK)

Central Union of Agricultural Producers and Forest Owners (MTK) represents non-industrial private forest owners at national level. Regional level Forest Owners' Unions are the applicants for regional forest certification. They provide training and consultation to forest owners. Local level Forest Management Associations assist forest owners in practical forest management by providing assistance in planning, implementation and timber sales.

Forest industry and state forestry have their own national, regional and local level organisations. State forests are managed by Metsähallitus. Municipalities have either own forestry departments or they buy the services from Regional Forestry Centres and Forest Management Associations.

Most timber sales in private forests, about 80% of harvested volumes are standing sales where the buyer is responsible for the planning and implementation of the harvesting work. The

felling and transport is done by contractors commissioned by the buyer who also supervises the quality of the work. Industry and state forestry also contract mostly private contractors for the different forest management activities.

3.3 Certification Standards in Finland

3.3.1 PEFC

Close to 95% of the Finnish forests are certified according to the regional certification procedure under the FFCS-System. The respective standard for regional certification (SMS 1002-1) contains 37 criteria for sustainable forest management[3]. The PEFC Council endorsed the FFCS-System in April 2000 and the revised FFCS standards were endorsed in March 2005.

The regional certification procedure prescribes that local forest owners' organisations (e.g. Forest Management Associations) make a decision on certification in their general assembly. This is communicated to all the members and those owners who do not wish to participate can pull out of the certification process. The regional level Forest Owners' Association will then organise and apply for group certificate. In selling timber, each forest owner influences the buyer in writing whether he participates in the certification scheme. This is in a way a reconfirmation of the participation in certification.

3.3.2 FSC

In September 2004 the Board of the Finnish FSC Association was officially nominated to be the national FSC Working Group in Finland, which removed the administrative obstacles for the future endorsement of a FSC standard for Finland.

The draft FSC standard for Finland was approved by the Finnish FSC Association on November 24, 2004. It is a revision of the earlier draft already presented to the FSC International for endorsement. The draft standard was field tested by forest industry companies UPM-Kymmene and StoraEnso. UPM-Kymmene tested selected criteria and indicators in company forests together with WWF (UPM 2005), whereas StoraEnso organises pilot group certification in municipal and large-scale private forests. Results from the latter testing are foreseen in fall 2005.

The draft FSC standard consists of 166 national indicators grouped under the FSC Principles and Criteria (Table 3.1). The indicators set the specific measurable requirements for forest management in Finland. Based on these indicators the conformity to the Criteria and Principles is assessed in a certification audit.

In 2004, the only FSC certified forest holding of 93 ha in Finland is in the neighbouring region Satakunta.

[3] Available at *www.ffcs-finland.org*

Table 3.1 Number of Criteria and Indicators in the Draft FSC Standard for Finland

FSC Principle	1	2	3	4	5	6	7	8	9	10
Number of criteria	6	3	4	5	6	10	4	5	4	9
Number of indicators	15	6	11	24	17	44	10	14	5	20

Source: FSC 2004

3.4 Forestry and Forest Certification in the Pirkanmaa

The forests in the Pirkanmaa region are dominated by productive spruce, pine and mixed forests. In the southern part of the region areas of fertile herb-rich forests are common. Private non-industrial forest owners occupy 74% of the total forest area and the share of industrially owned forests is 11%, municipal forests 4% and state forests 11% (Figure 3.2). The average size of a private forest holding is 27 hectares, the quarter less than the average in the country.

In December 1999 the DNV-Certification Oy/AB issued the Forest Owners' Union of Western Finland the regional group certificate that covers forests of all participating forest owners in the region. There are only PEFC certified forests in the Pirkanmaa region and 91% of the total forest area is certified (excluding the permanently protected forest areas) (Table 3.2).

Industry, municipalities and state forestry can join the regional certification with a written announcement to the Forest Owners' Union. Non-industrial forest owners participate in the regional certification by making a decision in the statutory meeting of their Forest Management Association. If a forest owner wishes to resign from the certification, a written notification on the withdrawal is required. Forest owners that have chosen to resign from regional certification own mostly small forest areas (average below 20 ha) and have very little commercial harvesting operations.

About 21 900 forest owners (forest holdings) participate in the regional group certification. Over 99% of the participants are private, non-industrial forest owners, 0.2% forest industry companies, 0.5% municipalities, state and other public institutions. The private forest owners and municipalities own 79% of the certified forests, forest industry's share is 10% and state forests cover 11% (Figure 3.3 and Figure 3.4). The state owned research forests managed by the Forest Research Institute (Metla) are not certified because Metla wished to maintain the possibility to study any kind of forest management in the research forests. The Institute manages about 7 000 ha in Pirkanmaa, which decreases slightly the share of certified state forests.

Figure 3.2 Forest Ownership in Pirkanmaa Region, Finland

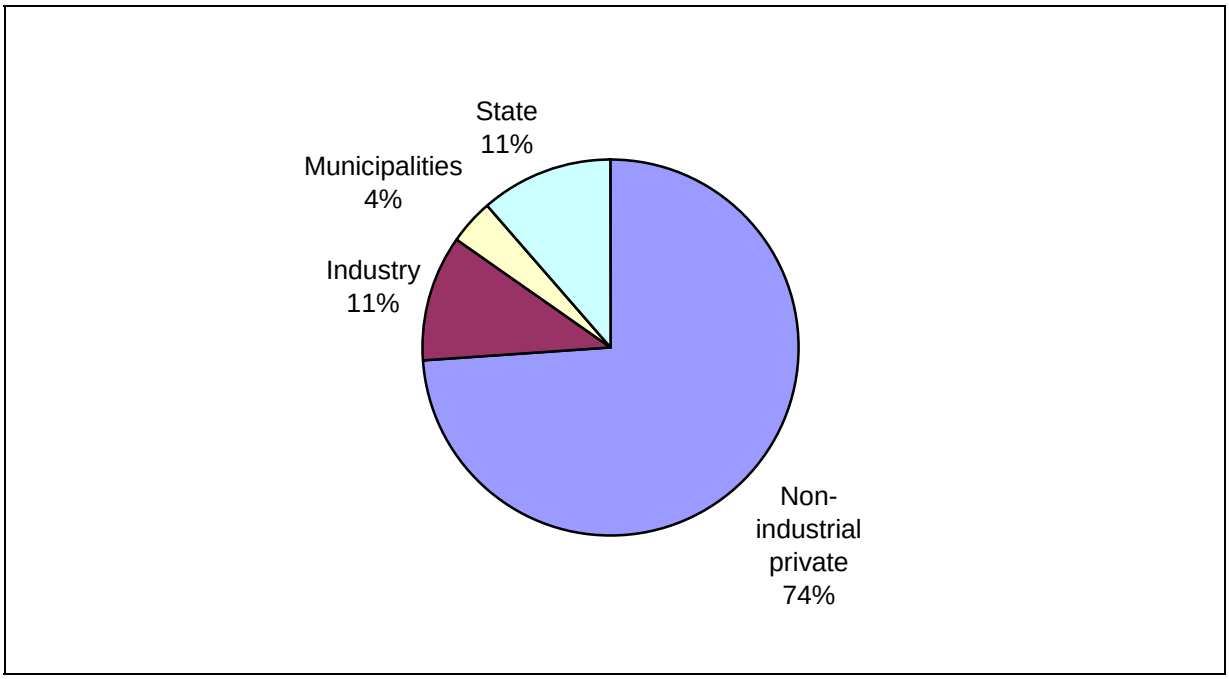
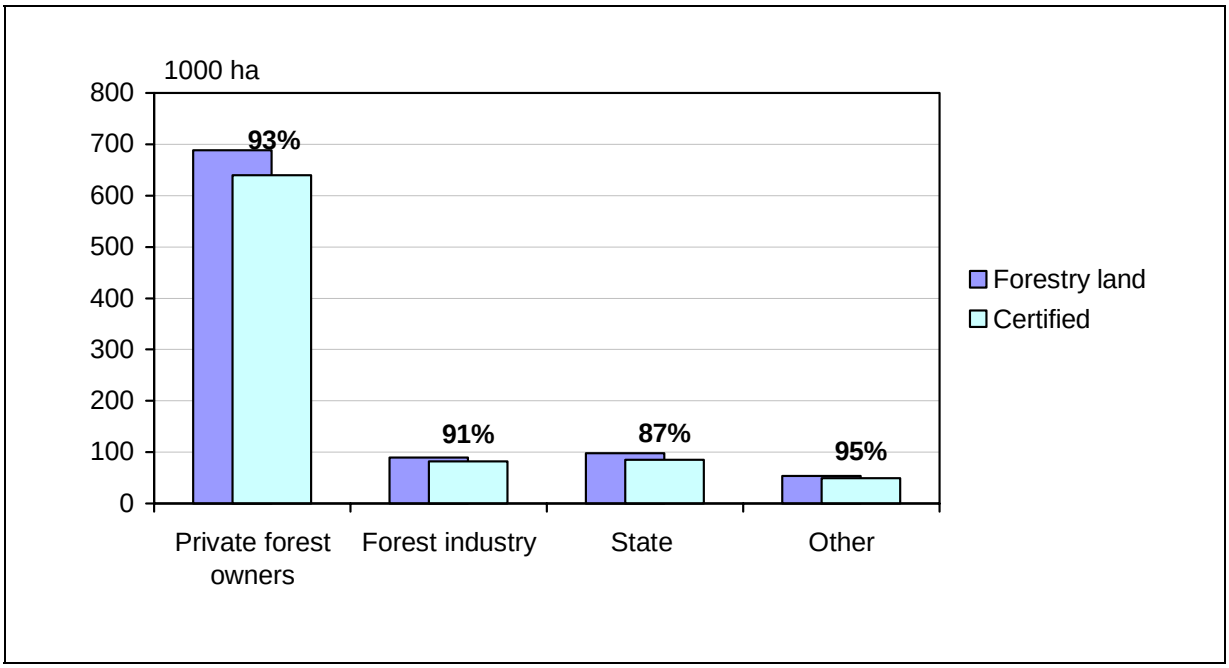


Table 3.2 Forest Area in Pirkanmaa

Forest Area	Area (ha)	Share
Total forestry land* of Pirkanmaa region	937 000	100%
Productive forest and scrub land	911 000	97% of total forestry land
Permanently protected area	15 200	1.6% of total forestry land
PEFC certified area	857 000	91% of total forestry land (excluding protected areas)
FSC certified area	0	0

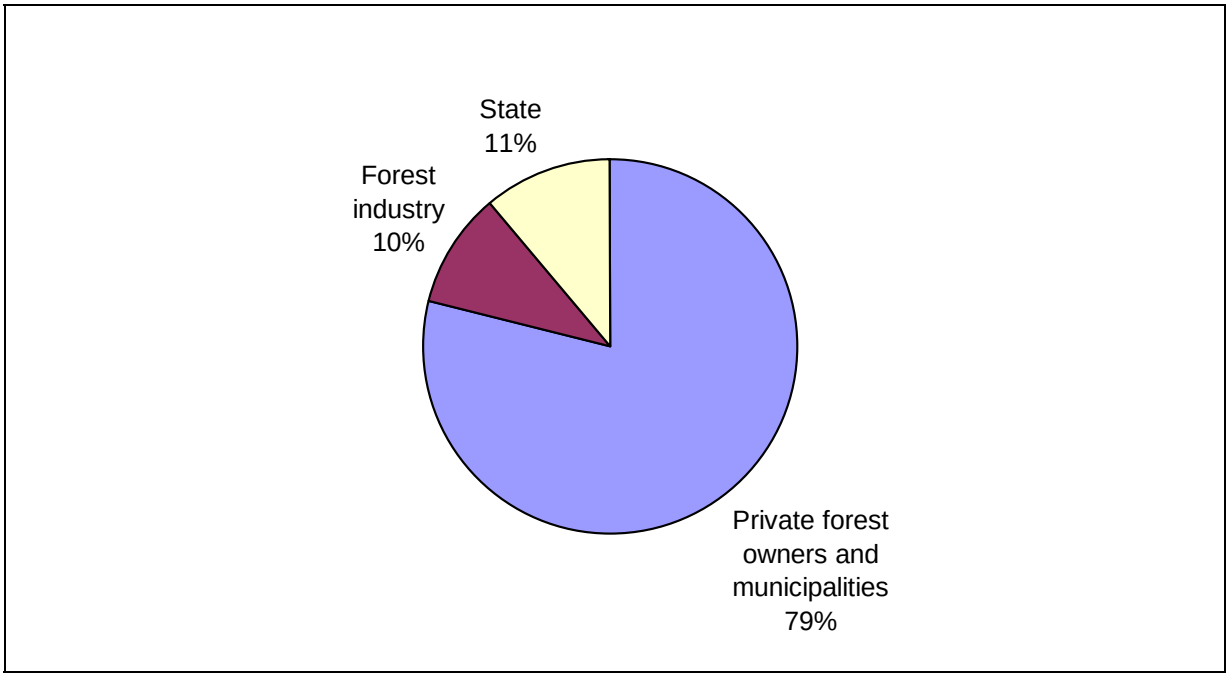
Source: Pirkanmaa Forestry Center 2003, Metla 2004
** Metla 2004: Forestry land includes (i) productive forest land, (ii) scrub land, (iii) waste land and (iv) other, e.g. storage areas, forest roads etc.*

Figure 3.3 Forest Certification According to Forest Ownership Categories in Pirkanmaa*



Sources: Interviews Forest Owners' Union of Western Finland, Metsähallitus, Metla 2004
**Excluding permanent protection areas*

Figure 3.4 Share of Certified Forests by Ownership Category in Pirkanmaa



3.5 Incremental Requirements of Forest Certification in Finland

3.5.1 Scope

The incremental performance requirements of the certification standards were evaluated against the Finnish legislation. The standards used were the SMS 1002-1 standard for the sustainable management of forests in Finland in the area of a Forestry Centre (April 1997) and the draft FSC standard for Finland (November 2004). Pan European Criteria and Quantitative Indicators provided the framework for the assessment (Table 2.2). Annex 1 includes a detailed analysis on the performance requirements in the two standards. The differences of the two standards were evaluated qualitatively and conclusions are presented in summary boxes.

3.5.2 Standard Requirements and Legislation in Finland

3.5.2.1 Criterion 1: Maintenance and Appropriate Enhancement of Forest Resources and Their Contribution to Global Carbon Cycles

(i) Normative Framework and common practices

The Forest Act requires that forests shall provide sustainable yield while the biological diversity is maintained (Sec 1). It does not prevent adoption of forestry land to other land-use purposes (Sec 3), where regulations on construction and municipal planning apply. Maintenance of sustained production capacity in a forest area has been the basic principle in the Finnish forest legislation. The current normative rules set the criteria for forest stands eligible for regeneration felling and detailed provisions for successful regeneration of felled sites. The allowed intensity of intermediate cutting is also defined.

An allowable sustainable harvesting level is estimated for the Forestry Centre area, monitoring data on harvesting operations provide feedback on the conformity to the estimation and the data is used for regional level strategic planning. Forest owners shall conform to the normative rules on harvesting intensity.

(ii) Standard Requirements (for details see Annex 1)

- SMS standard set provisions to the harvesting levels and maintenance of the production capacity in forests.
- FSC standard require that harvesting shall not exceed the long-term production capacity of forests. FSC requires that negative impacts of fragmentation of forest areas are taken into consideration when operating on the continuous areas of mature forest.
- Carbon balance in forests is not explicitly addressed by either of the standards, but implicitly maintenance of productive forest cover contributes to the carbon sequestration in wood biomass.

Box 3.2 Remarks on the FSC and SMS Requirements on Forest Resources

Regarding the maintenance of forest resources, the performance requirements in the SMS and FSC standards do not significantly exceed the normative requirements and the established guidelines and practices for sustainable wood production.

The FSC standard considers the prevention of fragmentation, which is not addressed in the SMS standard. The standard may decrease fragmentation in large-scale forest management but its impact on small-scale forestry remains limited. On the other hand, FSC restrictions on the size of clear-cuttings tend to increase fragmentation if significant compromises in the allowable harvesting levels are not made.

3.5.2.2 Criterion 2: Maintenance of Forest Ecosystem Health and Vitality

(i) Normative Framework

The Pan European Criterion on forest health focuses on external biotic and abiotic agents damaging or threatening the condition of forests. The criterion addresses air pollution and its impacts on forests as well as wind and insect damages. Especially the abiotic agents cannot be controlled by forest owners and therefore they have not been included in the forest management standards. The National Forest Research Institute, Environment Centres and other state institutions monitor systematically forest damages. Insect damages and diseases shall be prevented at regional and FMU level as stipulated by the respective Act (1991:263). Legislation sets also provisions for the use of chemicals and biological control agents as well as for the control of game populations.

Only the pesticides and herbicides approved by the Ministry of Agriculture and the National Plant Production Inspection Centre may be used. The chlorinated hydrocarbon pesticides (e.g. WHO Type 1A and 1B) and a number of other chemicals harmful to environment or human health have been prohibited for years. The EU directive (C2000:4140) sets restriction on the use of permethrin.

Forest fires are not a serious threat to forests in Finland, due to the humid climate, good awareness of the fire risk and efficient fire control. Long-term tradition and information campaigns on the prevention of forest fires have been successful. This is why neither SMS nor FSC standard address forest fires.

The Hunting Act and other provisions on game management set the framework for game protection measures and any compensation paid for game management. The target levels for the game populations, approved by the Ministry of Agriculture and Forestry, set the framework for annual hunting permits. Forestry legislation defines the conditions for the compensation payment for game damages to forestry.

(ii) Standard Requirements

- SMS denies the use of all chemicals or biological control agents on the buffer zones to water bodies and on the ground water areas important for water supply. Buffer zones shall be adequate land strips that prevent leaching to waters. In Pirkanmaa a tree length (15-20 m) is considered to be an adequate width for buffer zone bordering a valuable

habitat protected by the Forest Act although exact requirements on the width are not included in the standard. Buffer zones along the sites with lower biological value are usually somewhat narrower.

- Spruce root rot and spongy sap-rot of pine cause severe damage in forests. The SMS standard requires that an increasing share of harvested risk areas are treated with biological control measures. The standard requires monitoring of the use of chemical and biological control agents.
- SMS standard requires annual monitoring of conformity to the regulations on storing timber in forests. The regulations prohibit any timber storing during the summer months as a measure to prevent outbreak of insect damages.
- FSC standard prioritises the mechanical protection methods against biological and chemical ones. Use of chemicals should be strictly avoided in forests. An environmentally compatible plan for pest management shall be made for risk areas. If chemicals or biological control agents are applied, they shall not be used on 20-meter wide buffer zones to water bodies or key biotopes and their use shall be monitored.
- FSC standard also demands prevention of spruce root rot and spongy sap-rot of pine in high-risk areas during summer harvesting.
- Grazing damage of moose is a problem in young stands. However, neither of the standards addresses directly the prevention of these damages.

Box 3.3 Remarks on the SMS and FSC Requirements on Forest Health

Regarding forest health and vitality the SMS and FSC standards are compatible in requiring protection against the main cause of forest damage (root rot). The FSC standard set more specific restrictions on the use of chemicals but the difference has little practical significance, because the use of chemicals for damage protection is well controlled in legislative and operational levels and their use is very limited.

If chemicals are used, the FSC standard requires extensive buffer zones to protect water ecosystems and valuable habitats whereas the SMS standard aims at minimum zones adequate to prevent leaching to water bodies. SMS does not require categorically buffer zones around valuable terrestrial habitats. The site conditions define the need and width of a functional buffer zone. Both standards ensure protection of water ecosystems and valuable habitats if correctly applied. Appropriate implementation of the SMS requires a better knowledge on local site conditions and a higher competence from forest management planning and implementation for the estimation of the adequacy of a buffer zone.

Both standards have a fairly narrow but practical view on forest health and vitality. The performance requirements in the both standards slightly exceed the normative regulations.

3.5.2.3 Criterion 3: Maintenance and Encouragement of Productive Functions of Forests (wood and non-wood)

(i) Normative Framework

The Forest Act stipulates that forests should provide sustainable and satisfactory yield (Sec 1). Forestry Centres shall draft, together with the major stakeholders, a Regional Target Programme that set the economic, ecological and social targets for forestry in the region. The plan is revised every five years (Forest Decree Sec 1). Forest owners submit a forest use notification to the regional Forestry Centre not later than two weeks prior to the planned harvesting activities. The Notification includes information on e.g. the valuable habitats

protected by the Forest Act, planned activities and regeneration plans. Forestry Centre can prohibit the operations under justified reasons or demand revision of the planned activities. Forest owner shall notify the Forestry Centre when the harvested site is seeded or planted.

Damage to the remaining stand and soil shall be avoided in forest harvesting operations. The Forest Act stipulates that Forestry Centres regularly monitor harvesting damages, regeneration and thinning operations, supplementary ditching, road construction and other operations for which public financing has been allocated. Thresholds for an acceptable level of harvesting damages are defined in regulations.

In Finland a forest management plan is not required at a FMU level and if prepared it is a guiding document that shall facilitate the short and long term planning in a FMU. For regional planning Forestry Centres prepare regional plans on forest resources and their development trends.

The major non-wood forest goods in the pilot areas are berries, mushrooms and game[4]. The non-wood products are often linked to recreational use of forests but they have also regional economic importance. Common law on Everyman's Right for Free Access ensures that the public has an access to the non-wood goods [Note: hunting is regulated by authorities and hunting in a forest area is allowed only under permission by the owner]. Normative rules do not stipulate any requirements for enhancing of the yields of non-wood products but provide guidelines for good forest management planning that takes these issues into consideration.

The Forest Research Institute evaluates the harvest levels of major non-wood products at a national level. The Finnish Game and Fisheries Research Institute carries out annual monitoring on the wildlife populations. The Institute has also responsibilities for game protection.

(ii) Standard Requirements

(a) Wood production

This section covers the wood production from the commercial point of view as defined in the Pan European C&I. Forest management planning is an integral part of efficient and economic timber production. Planning combines also the economic, environmental and social objectives of forest management in a FMU. For this reason all the elements the SMS or FSC standards require to be addressed in a forest management plan criteria (Table 3.3).

- SMS standard set provisions to the harvesting levels and maintenance of the production capacity in forests. Special consideration is given to tending of young stands and intermediate cutting.
- In the SMS standard the diversification of forest produce, environmental and social implications of forestry are addressed in the regional Sustainable Forest Management Target Programme (Criterion 1, FA Sec1).
- Neither legislation nor the SMS standard requires a FMU level forest management plan. However, at the regional level FMU or larger-level plans should cover at least 50% of the production forest area.

[4] Reindeer herding is not included in the study.

- The plans shall take into consideration also biological and environmental values of forests (Table 3.3) and be periodically revised. SMS respects the validity periods of 10, 15 and 20 years that take into consideration the lower growth rate in the Northern Finland where longer planning cycles are applicable. SMS respects the confidentiality of the information on private forest property and does not demand publishing any information from the plan. Management plans for municipal and state forests are public.
- FSC requires a preliminary FMU-level social and environmental impact assessment of forest management and the results should be taken into consideration in FMU level forest management plan. The owner should strive for achieving the optimal value for forest products in the region
- In FSC a valid FMU level management plan is a precondition for certification. The plan shall include biological, environmental and social aspects of forest management and descriptions on the management system and methods (Table 3.3).
- Plans shall be revised every ten years.
- Large-scale forest owners (>10 000 ha) and municipalities (>1 000 ha) shall implement landscape ecological planning with extensive participatory processes.
- The FSC standard requires evidence that a forest owner has adequate financial resources to implement the planned activities in forests (I5.1.2-3)
- FSC (I7.4.1-2) requires that forest management plans for state forestry and municipalities are public documents as well as summaries of the plans for private FMUs (excluding information on timber quantity and sales).

Table 3.3 Provisions for Forest Management Plans of the Finnish SMS and FSC Standards

FSC standard [1)]	SMS standard [2)]
General: - Ownership, land-use statue - Socio-economic conditions - Profile of adjacent lands - Long term economic, social and ecological objectives	*General:* - Basic information on the FMU and its ownership and FMU level management objectives are described in the plan (Planning guidelines)
Timber production: - Forest resources - Environmental limitations - Rationale for annual harvest and species selection - Provisions for monitoring forest growth and dynamics - Description of the management system - Description of harvesting techniques, equipment	*Timber production:* - The plan covers site-specific information on the quality and quantity of current forest resources, planned harvesting and silvicultural activities (Planning guidelines).
Environmental aspects: - Environmental safeguards - Restoration measures for endangered species - Identification and protection of endangered sp. - Valuable habitats - Habitats of endangered species	*Environmental values:* - Protected areas, areas in protection programmes - Valuable habitats - Known habitats of specially protected species - Game management areas
Social aspects: - Consideration of the social impact assessment	*Social aspects:* - Hiking routes and recreation areas

[1)] Indicators 5.1.1, 7.1.2, 7.1.3, 7.2.1, [2)] Criteria 3, 18

Box 3.4 Remarks on the SMS and FSC Requirements on Forest Management Planning

Both SMS and FSC standards set comparable provisions to maintain the productive functions of forests in wood products.

The SMS standard has a regional approach to the enhancement of the production of high quality and quantity timber and includes provisions exceeding the normative level on tending and intermediate cutting. Certification has had a significant contribution to the increase of these activities in Pirkanmaa forests. The requirement exceeds the normative regulations on the management of young forests.

FMU level: FSC is stricter in demanding preliminary studies and a forest management plan for all certified FMUs also the consideration of ecological aspects and participatory elements in planning are more extensive in the FSC standard. Information on their practical implementation is not available.

In the both cases the plans are not normative and can be adapted to the changing conditions for forestry during the planning cycle.

The basic information to be included in the management plan is largely similar in FSC and SMS standards but FSC requires separate studies on the environmental and social impacts.

(b) Non-wood goods

- Among non-wood products SMS addresses only reindeer herding. Procedures to develop other non-wood products are elaborated if the issue is deemed important (e.g., in the regional Sustainable Forest Target Programme) and special development programmes are launched.
- Among non-wood products FSC addresses specifically fish, game and reindeer. FSC restricts harvesting on areas where lichen is gathered and submits all management and operational plans to the endorsement of reindeer herding cooperatives and their sub-units (discussed also under Criterion 6).

Box 3.5 Remarks on the SMS and FSC Requirements on Non-wood Products

In Finland the harvest levels of most common non-wood products are marginal compared to the production potential. The SMS standard has a regional approach to the enhancement of the production of non-wood products if special measures are needed for their increased production.

FSC focuses on the FMU level and addresses the optimal use of forest products. This may be impractical in many particularly small FMUs when diversified use early becomes an elusive target.

Reindeer herding has an overruling role in the FSC standard in state and private forestry. In the SMS standard the focus is on state forests as most of these forests are state-owned.

Apart from reindeer herding there are no significant substantive differences between the SMS and FSC standards on non-wood forest products.

3.5.2.4 Criterion 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems

(i) Normative Framework

In Finland the biological diversity in forest ecosystems is maintained and enhanced through (i) the network of permanently protected areas and (ii) protection of biologically valuable habitats and characteristics in production forests. Forest certification standards set provisions on the biodiversity conservation in production forests and the question on the scale and quality of permanently protected areas should be discussed in another context. The normative framework described below explains the regulations applying in ordinary production forests.

The Forest Act (FA) and the Nature Conservation Acts (NCA) set the basic normative provisions for biodiversity protection in forests. The EU Framework Directive for water focuses on the maintenance of aquatic ecosystems and has implications also in forestry activities. The Forest Act (10 Sec) lists seven habitats of special importance whose habitat characteristics shall be preserved in production forests (Box 3.6). The forest use notification should include information on e.g. these valuable habitats if occurring on the site to be harvested. A national-level survey on these habitats has been made and forest owners have been informed on occurrence of these habitats on their FMU. Forestry Centre can prohibit the operations under justified reasons or demand revision of the activities planned.

The share of these habitats in Pirkanmaa region is about 0.6 % of forest land.

The Nature Conservation Act stipulates the designation of Nature Reserves, Natural Monuments (Ch.3, Sec 10), National Conservation Programmes (Ch.7 Sec 50) and Natura 2000 Network (Ch. 10). No commercial forest management is carried out in the areas belonging to nature reserves or conservation programmes and very restricted forest management is allowed on Natura 2000 areas. The Act also requires protection of the listed biologically valuable forest habitats (Box 3.7).

Box 3.6 Habitats of Special Importance According to the Forest Act

1) The immediate surroundings of springs, streams, wet hollows in the permanent beds of streams, and small pools;
2) Herb-rich and grassy hardwood-spruce swamps, ferny hardwood-spruce swamps, eutrophic paludal hardwood-spruce swamps, and eutrophic fens located to the south of the Province of Lapland;
3) Fertile patches of herb-rich forest;
4) Heathland forest islets in undrained wetlands;
5) Gorges and ravines;
6) Steep bluffs and the underlying forest; and
7) Sandy soils, exposed bedrock, boulder fields, wetlands with sparse tree stand and flood meadows which are less productive than nutrient-poor heathland forests.

Source: Forest Act 1996:1093

Box 3.7 Wooded Habitat Types Protected by Nature Conservation Act

1) Wild woods rich in broad-leafed deciduous species
2) Hazel woods
3) Common alder woods
4) Juniper meadows
5) Wooded meadows
6) Prominent single trees or groups of trees in and open landscape

Source: Nature Conservation Act 1996:1096

Finland is committed to the EU regulations and international conventions on the protection of threatened species and the Nature Conservation Act has been updated accordingly. The Act includes lists of different categories of protected and threatened species:

- Habitats of the species protected by the EU Habitat Directive Annex IV should be preserved when encountered in forests.
- Regarding species under strict protection, Regional Environment Centres demarcate the habitat area in field and inform forest owners.
- Other protected or threatened species should not be used or damaged, but no specific requirements on habitat protection are given.

If the operations are planned on recorded habitats of species listed in the EU Habitat Directive Annex IV, Forestry Centre shall, together with the Regional Environment Centre, define appropriate management operations. In practice the procedure is operational in Pirkanmaa in protecting the habitats of the key listed species e.g. Siberian flying squirrel (*Pteromys volans*).

Regarding forest regeneration the forest legislation (Forest Act Sec 8) requires systematic and planned regeneration of harvested sites within three to five years from regeneration felling. The landowner is responsible for successful regeneration. The legislation does not restrict the use of non-native species for forestry purposes. However, the Plant Production Inspection Centre sets quality requirements for the origin and quality of seed and seedling material. The norms on biosafety do not allow the use of gene-modified trees in forest management.

(ii) Standard Requirements

(a) Rare Ecosystems –Rare ecosystems, special management regimes

- The SMS standard has a qualitative approach to the biodiversity conservation. In addition to the preservation of sites defined in Forest and Nature Conservation Acts, SMS requires that typical characteristics shall be preserved also on sites that are less representative or ore common than those being protected by the Forest Act. In addition SMS requires the protection of the typical characteristics of a list of other valuable habitats (C10) (Box 3.8). SMS does not require a buffer zone around the valuable habitats. The SMS standards are applied in production forests and do not consider permanent protection areas. However, the extent of protected areas in a region influences biodiversity objectives and measures defined in the Regional Target Programme.

- The share of valuable habitats preserved by the SMS standard is about 3 to 4% of forest land in the Pirkanmaa region (Tapio 2002-2004).
- The FSC standard has a more quantitative approach to biodiversity conservation. It requires that 5% of forest land in each FMU shall be managed for biodiversity protection. This measure is supposed to contribute essentially to species protection (6.4.1) and the share should be met at an FMU level or in the total area of group certification[5]. Only management aiming at restoration of habitat characteristics for protected and endangered species is allowed on these sites. The following sites can be included in the 5% share (Box 3.9).

Box 3.8 Additional Habitats Preserved by SMS standard

1) Habitats defined in the Forest Act, which are common in the area or not representative enough to be protected by the Forest Act
2) Old-growth coniferous forests, mixed forests and broad-leaved forests that are valuable for nature conservation
3) Southern ridges, kettle holes
4) Herb-rich swamps
5) Wooded pasture lands and forest meadows in tradition landscapes

Box 3.9 Sites Included in the FSC 5% Set-Aside Areas

1. Legal protection areas, areas in official protection programmes, areas designated for protection in official land use plans – provided that the landowner has not received compensation for the protected land. State enterprises can count only the areas protected on their own decision.
2. Habitats defined in the Forest Act and Nature Conservation Act
3. Southern slopes of eskers, potholes, forest pastures, slash-and-burn meadows, herb-rich sledge-dominated spruce and pine swamps
4. Near natural forests having at least 10 m^3 of varying types of dead wood per hectare
5. Known habitats of regionally or nationally endangered species
6. Surroundings of the nest trees for eagle and osprey within at least 50 m radius around them
7. Bufferzones of at least 20 meters around the valuable habitats defined in the Forest Act, old-growth forests and habitats of endangered species dependent on sheltered micro climate.

If the 5% quota is not reached the FSC standard defines a list of additional protected sites and sites for restoration activities. The protected sites shall be indicated in the forest management plan.

In addition:

- The FSC standard does not allow any forest management (except restoration) on unproductive forests (annual growth < 1 m^3/a) or wasteland (annual growth < 0.1 m^3/a) (6.4.2).
- Both SMS (C26) and FSC (6.2.2) standards address the need to restore endangered peat land ecosystems. No first-time draining is allowed in either of the standards.

[5] Group certification in FSC is not typically applied in large compact areas.

Neither the SMS standard nor legislation require the maintenance of continuous tree cover except in high altitude forests. In moist and paludified forests or swamps, tree cover is nevertheless usually maintained.

The FSC standard (I6.3.3) requires permanent tree cover be maintained at least on 10% of the forest land. Only selective or gap harvesting is allowed to promote multi-layered stand structure. The 10% quota may include the following sites (Box 3.10).

Box 3.10 Areas Included in the FSC 10% Permanent Forest Cover Area

1. Sites defined in I6.4.1 (listed above in Box 3.9)
2. Spruce and pine swamps set aside
3. Moist or paludified forests
4. Herb-rich forests
5. Forests adjacent to water courses (including 20 meter buffer zones)
6. High altitude forests (>300 meters above sea level)
7. Archipelago and forests important for scenery
8. Forests surrounding protected habitats and areas (20 meter buffer zones)

Box 3.11 Remarks on the SMS and FSC Requirements on Protection of Biologically Valuable Habitats

The types of valuable habitats to be protected or preserved are comparable in the both standards. Both standards protect the habitats protected by the FA[6] or NCA[7] and a number of additional habitats. SMS defines that the valuable habitats should be small in size (one hectare at the maximum, whereas FSC requires a broader delimitation if needed and an extensive buffer zone (20 m) around these habitats. In addition the total share of the set aside areas in FSC shall reach up to 5% in an FMU although the valuable habitats and their buffer zones would not cover such an area.

The average estimate for the set aside area in SMS standard in Pirkanmaa region would be 4.6% of productive forest land compared to the 5% share FSC requires at a FMU level. In addition FSC restricts regeneration felling on 10% of the forest area.

It is unclear to what extent the blank 5% requirement for set aside areas in the FSC standard may contribute to biodiversity conservation as in many FMUs, often small in size, there are no such values to that extent. The SMS applies a conservation strategy, which is driven by "performing where it is worth-while" and conservation of sites of biological value (note: small key-biotopes preserved by FA and NCA). However, at a regional level valuable habitats and buffer zones together bring at regional level the set-aside area close to the threshold-value of 5%.

The both standards exceed the normative regulations in view of demanding set aside areas or areas for restricted use. FSC requires more set-aside areas than the SMS.

[6] Forest Act
[7] Nature Conservation Act

(b) Threatened Species

- The SMS standard (C20) requires that the habitats of endangered species under strict protection and marked by the regional environment authorities shall be protected and the habitats of other threatened species are taken into consideration in forest management to ensure an appropriate population level of the species.
- The FSC standard (6.4.1) clearly states that the habitats of regionally or nationally threatened species shall be monitored and protected and a 20-meter buffer zone left around the habitats. Official classification for regionally threatened species does not exist, but regional environment centres list the species that are endangered at a regional level.
- Prescribed burning is a measure to improve the populations of the threatened species dependent on burned wood. SMS (C9) and FSC (I6.2.2) require an increase in the area of prescribed burning. FSC requires that at least 20 m^3 of large trees shall be left to burn.
- FSC also requires that harvesting is avoided in the listed forests with a high abundance of nesting birds. This issue is not addressed directly in the SMS standard. However, a committee on summer harvesting and other working groups have defined guidelines for avoiding timber felling during the nesting season. The nests of larger birds of prey are marked and protected based on their status as threatened species.

Box 3.12 Remarks on the SMS and FSC Requirements on Species Protection

The concept and protection of threatened species is complicated in forest management. Partly the legislation requires that habitats of these species are protected if encountered (EU Habitat Directive) and partly only if demarcated in the forest (Species under strict protection, NCA). Other listed threatened species must not be used or damaged, but very little specific provisions for habitat protection are given. Reliable and useful information on occurrences of these species is partly scattered and recognition of most of these species requires special expertise not always available in forest management.

Within this framework the SMS standard has taken the position to rely on normative regulations and specify the provisions to habitats of species under strict protection and those for which Regional Environment Centre has given site-specific information. The species listed in Habitat Directive are taken into consideration under the general objective to conform to legislation. However, in most SMS audits all registered observations of threatened species regardless of their category have been taken into consideration and appropriate protection measures have been demanded.

The FSC standard requires protection of the habitats for nationally endangered species and for those included in the lists regional environment centres compile on rare and threatened species at a regional level. FSC also requires that forest owners are active in finding information on the occurrence of such species whereas SMS relies on the existing databases and the information obtained in forest management planning.

FSC delegates the responsibility to survey information on threatened species to forest owners and demands habitat protection with buffer zones to all occurrences of threatened species at national or regional level. The provisions are more demanding than those in SMS.

(c) Diversity in Production Forests – regeneration, genetic diversity, dead wood

- The SMS standard (C8) requires that forest regeneration is at an acceptable stage at a regional level. [Note: Forest Act requires prompt regeneration for all harvested sites]. SMS measures the level of compliance to the legislation and sets regional targets to improve the regeneration level.
- SMS emphasise the use of domestic tree species and appropriate provenances. *Larix sibirica* is considered as a native species. The hybrid aspen is not referred to in the standard.
- Decaying wood is a key resource that increases biodiversity in forests. SMS standard demands that snags, hollow and other decaying trees and listed ecologically valuable trees are left standing in the forest area. The regional average number of retention trees should be 5 trees per hectare. According to the monitoring results the real value has reached up to 11 to 13 trees per hectare during recent years in Pirkanmaa region (Tapio 2003, 2004). SMS does not set a target value for decaying wood in the forests.
- FSC standard also emphasises the use of domestic species but allows the use of exotic ones in special cases. *Larix sibirica* is also classified as a native species but the standard restricts the use hybrid aspen to two hectare cultures. In afforestation sites FSC allows monocultures only of three hectares in size.
- FSC (I6.3.1) states that recently died trees, if their abundance is under 10 m^3/ha, should be left unless sanitary reasons require their removal. In case this amount of dead wood is not available FSC requires that at least five large living trees shall be left as retention trees, the number should be ten if broad-leaved trees are available (I6.3.2). FSC standard (I6.3.2) lists also a number of living tree types that shall be left as retention trees.
- FSC standard prohibits the use of GMO organisms in forest. Legislation does not either allow their use in practical forestry. The revised FFCS standard will explicitly prohibit any use of GMOs in forestry.

Box 3.13 Remarks on SMS and FSC Requirements on Regeneration and Species Selection

Regarding forest regeneration, both standards are at the normative level. FMU level FSC certification ensures that each participating forest owner regenerates forests as appropriate. SMS has more impact at a regional level, because it strives to improve the level of regeneration in a large scale and not only among forest owners potentially participating in FMU level certification.

Regarding species selection, the implementation of the two standards would not differ significantly except on the limited use of hybrid aspen.

The size of a typical regeneration area, especially in private forests, is in most cases smaller (2-3 ha) than the limitations FSC standard sets for monocultures or use of hybrid aspen (max. 3 ha). In forest industry and state forestry the FSC limitations may have some impact to current forest management.

FSC standard requires leaving of more decaying wood in forests than the SMS standard. The FSC requirement to leave up to 10m^3/ha of dead wood when available has ecological significance. The SMS standard does not set any provisions for special areas for decaying wood but the monitoring results in Pirkanmaa indicate that the volume of retention trees left in annual harvesting has varied between 3.5 to 4 m^3/ha excluding the valuable habitats and reached 6 to 9 m^3/ha when the retention trees on these habitats were included (Tapio 2004).

Both standards exceed the normative requirements in view of increasing decaying wood in forests.

3.5.2.5 Criterion 5: Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)

(i) Normative Framework

The Forest Act (Sec 13) requires maintenance of the forest cover in high altitude forests and areas exposed to wind or landslides. Ministerial orders set provisions for soil protection in harvesting operations.

Regulations to avoid harvesting damages to remaining trees address also soil damages.

The EU Water Framework Directive 2000/60/EC and the Water Act address the protection of aquatic ecosystems and waters. The EU Directive requires water protection e.g. in soil scarification and draining operations. Forestry Centres consult Regional Environment Centres on the planned water protection measures in supplementary ditching operations and water protection plans are sent to the Environment Centre for revision and comments.

Normative rules also restrict the use of chemicals in ground water areas and in valuable habitats and establish restrictions on the use of pesticides containing permethrin (EU Directive 2000/4140). Normative regulations on the use of chemicals also require monitoring of their use.

Practically all draining and forest road construction in private forestry is partly financed by public funding. The plans for these activities are approved by the Regional Forestry Centre and must describe procedures for soil and water conservation. In all operations legislation on forestry, nature and water conservation must be observed. Members of voluntary certification must conform to the additional requirements defined in the SMS or FSC standards.

(ii) Standard Requirements

- According to the SMS standard (C31, 32) use of chemicals should be avoided if used for any other than protective purposes. Fertilizers should be used only as compensatory measure to increase the health of forests. No chemicals shall be used in valuable habitats or buffer zones.
- Buffer zones along water bodies should prevent all leaching to waters. The SMS standard (C28) does not set specific threshold values for the width of buffer zones but requires that they can prevent leaching in the local conditions. The common width of buffer zones in the pilot region has been 7 to 8 meters that in general has been deemed adequate in audits. Buffer zones left around the most valuable water habitats protected by the Forest Act tend be wider and reach up to 20 to 30 meters.
- FSC standard also restricts the use of chemicals to protective functions (I6.6.2, 6.3.11). Fertilization to increase production should be strictly avoided.
- The requirements for buffer zones along water bodies are specified in the FSC standard (20-50 meters on mineral soil, 5 meters on drained peatland).
- Prevention of soil erosion is in the both standards ensured by proper implementation of harvesting, ditching, soil scarification and road construction guidelines.

Box 3.14 Remarks on SMS and FSC Requirements on Water and Soil Conservation

With regard to water conservation the SMS and FSC standards have a different approach. FSC sets quite extensive quantitative requirements for buffer zones (20 m) but does not address the ground water areas (which are, however, partly protected by legislation). SMS requires that buffer zones shall prevent leaching, but the standard does not set any categorical minimum width for buffer zones. In Pirkanmaa the buffer zones left around the biologically most valuable water bodies (protected by the FA) were about 20 to 30 m wide and 7-8 meters wide around other less valuable water bodies.

Soil protection is addressed in the normative rules and enforced by Regional Forestry Centres that provide financing and supervision, e.g. in draining and road construction. The most road construction and draining works receive public financing and are controlled by the Regional Forestry Centre, which ensures that the norms are respected in practice.

Monitoring results indicate that the quality of soil and water protection in different forestry operations has increased during the recent years, especially low quality water protection has not been encountered in the field monitoring (Tapio 2002-2004).

Implementation of the SMS standard on buffer zones requires that forestry staff is competent to assess the water protection measures adapted to the site conditions. This approach leads to effective water protection without excessive set-aside areas for buffer zones. FSC standard is more categorical on the width of the zones and also restricts more harvesting on these zones. Buffer zones in the FSC contribute to biodiversity protection also on terrestrial ecosystems and are included in the set-aside areas for biodiversity protection.

3.5.2.6 Criterion 6: Maintenance of Socio-Economic and Cultural Functions and Conditions

(i) Normative Framework

The Forest Act (Sec 1) requires that forests shall produce sustainable yield while biological diversity is maintained. The Regional Forestry Target Programme defines further the social, economic and ecological objectives for forest management in the region and sets the voluntary targets for forestry in the region.

Common law on everyman's right for access to forests and the normative provisions for nature and landscape protection in the Forest Act and Nature Conservation Act contribute to the recreational use of forests. Municipal zonal planning which has a normative status may restrict forest management on areas designated for recreational or customary use.

Legislation on property rights defines the general rights and duties of forest owners regarding the status and use of forest property.

Finnish labour legislation is extensive and meets the international standards. It addresses working conditions, work safety and health, and workers' rights. Finland has ratified all the relevant ILO Conventions related to workers' rights.

The Act on Archaeological Remains protects all historical sites, which are culturally important. Acts on reindeer herding and Sami people establish the framework for the rights and duties for the traditional livelihood and indigenous culture in Finland.

(ii) Standard Requirements

(a) Economic significance, contribution to GDP, revenue, expenditures

- SMS refers to the Forest Target Programme in setting regional level economic targets for forest management. FMU level targets are presented in holding level plans. SMS does not set any target levels for economic performance.
- FSC standard requires that FMU level forest management plan includes economic targets (I5.1.1) and adequate funding to carry out the planned activities.
- FSC standard (I5.2.1) also requires that forest management should optimise the value of forest goods (timber and non-timber), which in view of a non-industrial private forest owner is often restricted to the minimization of waste-wood in harvesting operations.

Box 3.15 Remarks on the SMS and FSC Requirements on the Economic Contribution of Forestry to Local Economy

On the provisions for the economic target setting and performance in forest management the SMS and FSC standards are compatible.

Regional-level target setting, referred to in the SMS includes the activities throughout the value chain from management to timber processing. The gains in economic and social benefits can be far more significant when development activities are planned from a regional perspective. The FSC requirement to optimise the value of forest goods in the FMU/group of FMUs is in most cases limited to optimisation of the value of harvested timber during the felling operation. FSC brings also the non-wood goods, including non-wood services to the variety of forest products of economic significance.

Apart from the formal target setting either at a regional level (SMS) or at a FMU level (FSC) the standards do not set additional provisions compared to legislation or common practice in any economic activity.

(b) Recreation and the rights of indigenous people, participation

- On the recreational use of forests, the SMS standard largely relies on the normative framework. The respect of every man's right (C33) and the preservation of valuable landscapes (C35) are based on the normative framework.
- The SMS standard requires that state forestry organisation (Metsähallitus) cooperates with Sami people and reindeer co-operatives on forest management in reindeer herding areas. SMS standard specifies the objectives of the legislation on Sami people and reindeer herding. Metsähallitus has developed an advanced and extensive participatory landscape ecological planning method and implements it in strategic planning on all forest areas in Northern Finland. Consultation with local interest groups is partially applied also in annual planning.
- The FSC standard extends the participatory landscape ecological planning to municipalities, state and large-scale industrial forests (>10 000 ha of size). Small-scale forest owners shall consult people or groups affected by forest management on the planned forest management activities (I4.4.4-5).
- The FSC standard requires that forest roads should be accessible for recreational use, including hunting. Forests should also be available for moose and deer hunting if there is not a justified reason to prohibit hunting (I5.4.5-6).

Box 3.16 Remarks on the SMS and FSC Requirements on the Consideration of Multiple Use of Forests and Stakeholder Participation

On recreational and multiple-use of forests SMS standard relies on the normative level. FSC standard demands landscape ecological plans from municipal and industrial forestry. The process may include participatory elements as does the respective planning in Metsähallitus, but examples from other countries indicate that it can be done also by experts with quite limited participation. FSC standard does not specify the required level of participation.

Among the forms of recreational use the FSC standard emphasises hunting. Forest owners should allow hunting on their grounds if no specific justification for prohibition exists. However, it is not clear what kind of justification would be acceptable (subjective of objective). Hunting is not a recreational right included in every man's rights. FSC raises hunting to a privileged position compared to other forms of forest use that require permission from a forest owner.

The most significant differences in the SMS and FSC standards relate to indigenous people and hunting. Provisions in the FSC standard exceed in these aspects the normative level and the SMS standard. On other aspects related to the multiple use of forests the differences are not so significant, although FSC demands a broader consideration of stakeholder views in forest management through the landscape ecological planning processes in large scale forestry.

(c) Employment

The Finnish legislation covers comprehensively the norms on working hours, employment contracts, occupational safety and health as well as the right to organise and make collective agreements.

- Additional requirements in the SMS standard focus on the improvement of vocational skills through on-the-job training. The requirement level is quite modest.
- FSC standard includes comparable requirements and states that workers shall participate in decision making in their organisation. This is already a practice to some extent in public organisations and applied also in some private companies.

Box 3.17 Remarks on the SMS and FSC Requirements on the Employment in Forestry Sector

Regarding employment in forestry the FSC or SMS standards do not set additional provisions compared to those in legislation. Criteria specifying conformance to payment of all statutory fees (FSC CI2.1, SMS C17) and their annual auditing have however, practical significance to companies and contractors.

(d) Public awareness and participation, cultural values

- National legislation requires public hearing and publicity in large-scale projects that have impacts on the environment. Forestry operations do not generally fall into this category. Municipal zonal planning is also public. In forestry the Regional Target Programme shall be prepared through a participatory process. On the other hand, individual forest management plans are confidential.
- SMS standard demands information among forest owners and protection of the cultural values according to the normative regulations. However, the regional certification is not

possible without extensive training of forest owners, contractors and staff in the planning organisations.

- Public participation is a key element in the FSC standard, as plans should be made fully or partially public and consultation should be applied in the certification process.

Box 3.18 Remarks on the SMS and FSC Requirements on Cultural Values and Stakeholder Participation

In view of the protection of cultural values and stakeholder participation the both standards rely on normative framework. (Except the FSC provisions for consultation with Sami people and Reindeer Herding Associations).

As a regional approach the SMS certification involves all organisations participating in forest management planning, timber procurement and monitoring. Forest owners' organisations, forest industry, state forestry, regional Forestry Centres have arranged training for their members and workers and for contractors doing the actual forest works (see Table 3.5 on certification costs).

The FSC standard requires more publicity and participation in forest management planning and monitoring. However, in the standard implementation the awareness raising is limited to the forest owner, workers, and contractors operating on a certified FMU. In FSC certification the awareness of the applicant forest owner on the standard requirements has been an aspect considered in audits.

3.5.3 Summary of the Assessment of the Finnish Standards

The performance requirements of the SMS 1002-1 standard and the draft Finnish FSC standard are in most key areas more demanding than current legislative norms, although a number of criteria in both standards are at a normative level. The most significant additional requirements of the SMS standard are in the promotion of forest health (root-rot), forest production (intermediate cuttings), and biodiversity protection (preservation of key biotopes). In multiple use and participation the SMS was more in line with the normative rules.

The draft FSC standard exceeds the normative level in identification of threatened species and key biotopes, and wide buffer zones are required to ensure the protective functions. The requirements on participation and involvement of indigenous people are also strict and exceed by far the normative level.

It should be noted that both standards are a result of stakeholder valuation of forest functions. It is an open question what thresholds would be scientifically justified for maintenance or enhancement of the various forest values e.g. for biodiversity conservation. Therefore, quantitative assessment of effectiveness in achieving SFM is very difficult. A different level of a requirement does not necessarily mean that probability increases to reach the desired goal. It may just be an expression of stakeholders' values, their forest perception or an extremely strict interpretation of the precautionary principle.

The recently published Parallel field testing of forest certification standards (UPM-Kymmene 2005) also concluded that balance of different interest groups in the standard setting process has a great impact on the consideration of environmental, social and economic aspects in the standard. Majority of one interest leads to more sophisticated standards on that interest which most often also result in higher performance requirements in these aspects. Reflecting the imbalance of the FSC working group with the absence of forestry organisations and trade

unions, the FSC Draft Standard for Finland was deemed more demanding in environmental aspects such as dead wood in forests and on pre-evaluation of social impacts of forestry and in the publicity of management plans.

3.6 Audit Results in Pirkanmaa Region

The majority of field audit sites were sampled from the data base on forest use notifications, that provide information on forest resources, natural values and planned activities. Auditors focused the sampling partly on the sites where valuable key biotopes or other special characteristics were reported. Thus, the sampling covered equally the forests of different forest owners. In Pirkanmaa certification audits in 1999 and 2004 covered the whole region (937 000 ha) and annual surveillance audits were focused on the areas of three to four forest management associations (14 000- 100 000 ha each). Each surveillance audit included verification of management guidelines and other documents and visits to 25-35 field sites. The certification and surveillance audits covered the activities of all organisations (non-industrial private forestry, industry, contractors, etc.) participating in forest management in the region.

In the first audit in 1999 a total of eight minor non-conformities were identified. Since then the number has averaged to two to three/per audit for the region with annual harvests of 3.7 millions m^3 (Metla 2004 and interview with Forest Owners' Union of Western Finland).

Protection of key biotopes (C10) has been the only persistent non-conformity identified in external audits. In 2004 the internal and external auditing sampled over 420 ha (130 sites) out of the total harvested area of 45 000 ha per year. On three sites, 0.16 ha in total (0.04% of the sampled area), valuable habitats were partly or totally destroyed, which was reported as a minor non-conformity in view of the low level of occurrence and small area involved. Distribution of requested non-conformities during the past five years is presented in Table 3.4. No major non-conformities were identified.

The applicant shall always present and implement corrective actions on each identified non-conformity.

Table 3.4 Distribution of Minor Non-conformities in Pirkanmaa in 2000-2004 in FFCS Certification

Criterion	Year				
	00	01	02	03	04
1. Sustainable forest target programme (content)	x	x			
9. Increase in prescribed burning (conformity to five year target)					x
10. Preservation of key biotopes	x	x	x	x	x
17. Adherence to statutory obligations (payment of legal dues, taxes)				x	
24. Environmental impact assessment of forest road plan		x			
25. No first time drainage is carried out					x
28. Buffer zones along waterways		x		x	
29. Target criteria for soil scarification			x		

Source: Forest Owners' Union of Western Finland 2004

The non-conformities are focused in practical forest management according to the SMS standard. The standard has very few management system elements. Certification bodies looked for procedures (written or oral) to gain evidence on the consistency of conformance to each requirement.

There are no FSC-certified forests in Pirkanmaa, neither has the draft FSC standard for Finland been used as a reference in certification. The Smartwood public audit reports on the only FSC certified forest management unit (93 ha, in 2004) in Finland can provide an example on the implementation of an interim FSC standard in a Finnish FMU. The report lists six conditions for the issuance of a certificate of which four were ongoing in the following surveillance audit. All the conditions were related to documentation or marking of boundaries in the field and none of them referred to non-conforming work in forests (*www.smartwood.org*). Audit reports from other countries indicate that it is common that many non-conformities in FSC audits relate to the management system elements, e.g. documentation in forest management.

DNV-Certification OY/AB assessed in fall 2005 in a pilot audit, the conformance of the forest management in the UPM forests in Finland to selected criteria and indicators of the FSC Draft standard. This audit focused on practical forest management and listed major non-conformities on the measures to increase dead wood in forests, and minor ones on the share of set-aside areas and on the content and publicity of forest management plan and signing of harvesting sites. These observations are in line with the main areas, i.e. decaying wood, set-aside areas, public awareness, which have higher performance requirements in the FSC than SMS.

In the certification process both PEFC based SMS certification and FSC certification allow so called “conditional certificates”, were minor non-conformities can remain open. However, in both systems corrective actions must be taken in due course as agreed with the certification body.

3.7 Certification Costs in Pirkanmaa

The structure of the cost analysis is presented in the Chapter 2.3.

3.7.1 Finnish Forest Certification System

The loss of stumpage revenues caused by the implementation of the SMS standard in the Pirkanmaa region is estimated at about EUR 1.2 million (Table 3.5). This equals a decrease of 0.95% in the income from forest management adhering to the current legislation (Nuolivirta 2004).

The estimate is based on the data collected by the Forestry Development Centre Tapio (2002) and it includes the commercial value of retention trees and trees left on the key biotopes, preserved according to the FFCS standard in addition to the requirements of the Forest Act. Nuolivirta (2004) concluded that, on a regional basis in SMS certification, the value of retention trees is the most significant investment in environment whereas preservation of key biotopes represents a lower economic burden for forest owners (Table 3.7).

Table 3.5 Cost of FFCS Certification in Pirkanmaa Region

	EUR/ha	EUR/a	%
Direct costs			
External auditing	0.02	15 300	1.3
Internal auditing (*)	0.003	2 300	0.1
	0.02	17 600	1.4
Indirect costs			
Organisational costs (*)	0.02	20 700	1.7
Loss of stumpage revenues (**)	1.39	1 191 900	96.9
	1.41	1 212 600	98.6
Total	**1.43**	**1 230 200**	**100.0**

(*) Includes only costs of private, non-industrial forestry organisations. (**) Based on Nuolivirta (2004) on the value of annual removals in Pirkanmaa.

3.7.2 FSC

Nuolivirta (2004) estimated that forest management according to the first FSC draft standard (2002) would decrease stumpage revenues by EUR 16.2 million in the Pirkanmaa region (Table 3.6). This equals a drop of 13% in the income from forest management adhering to the current legislation (Figure 3.5).

The estimate is based on data collected in the Nature Management Monitoring System (Tapio 2002), and it includes the commercial value of harvesting restrictions, set-aside areas, trees left on the biologically valuable habitats, buffer zones to these habitats, waterway buffer zones and retention trees, which shall be preserved according to the FFCS standard in addition to the requirements of the Forest Act. Nuolivirta (2004) concluded that the value of retention trees is the most significant investment in environment, on a regional basis (Table 3.6), whereas preservation of biologically valuable habitats represents a lower economic burden for forest owners.

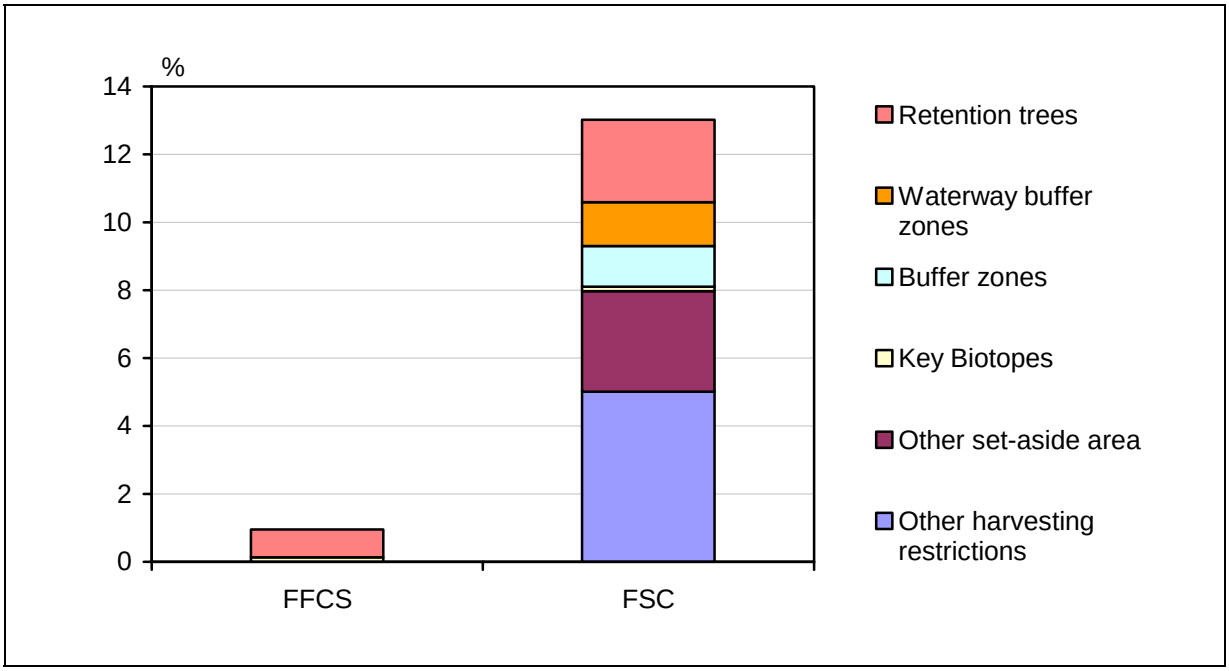
It was estimated that, if Pirkanmaa region would be audited and certified according to FSC, 14 separate organisations (applicants) would be needed to reach the same certification coverage as the FFCS has today. The applicant was assumed to represent 7 000 to 9 000 ha, that is an area comparable to that of one Forest Management Association. The potential applicants would include forest management associations, forest industry organisations and state forestry. The auditing cost for each applicant was estimated to be similar to the FFCS certification.

Table 3.6 Estimated Costs of FSC Group Certification in Pirkanmaa Region

	EUR/ha	EUR/a	%
Direct costs			
External auditing (*)	0.25	214 200	1.3
Internal auditing (*)	0.04	32 200	0.2
	0.29	246 400	1.5
Indirect costs			
Organisational costs	..	..	..
Loss of stumpage revenues (**)	18.84	16 200 000	98.5
	18.84	16 200 000	98.5
Total	19.12	16 446 400	100.0

(*) Includes 14 separate applicant organisations. (**) Based on Nuolivirta (2004) on the value of annual removals in Pirkanmaa.

Figure 3.5 Decrease in Stumpage Revenues in FFCS and FCS Certification in Pirkanmaa



Source: Nuolivirta 2004.

3.7.3 Comparison of Certification Costs

FSC has provisions for group certification but not for large-scale regional certification. Therefore, also auditing costs per hectare in forests dominated by small-scale private forest holdings would be considerably higher than in regional certification. The cost estimates are based on standard requirements and do not take into consideration e.g., the value of the wood trees left in forests in excess of the FFCS or FSC standard requirements.

Table 3.7 compares the costs of regional FFCS certification in the Pirkanmaa pilot region and the hypothetical cost estimates for a group certification at a level of forest management association in Pirkanmaa region.

Table 3.7 Comparison of FFCS and FSC Certification Costs in Pirkanmaa

Certification costs	FFCS	FSC
	EUR/ha	
Direct	0.02	0.29
Indirect	1.41	18.84
Total	**1.43**	**19.12**

The cost comparison is indicative and possibly overestimates the costs of FSC certification compared to the current forest management. However, the FSC standard requires double number of retention trees, wider buffer zones with very restricted harvesting and 1-2% more set-aside areas than the SMS standard. The current standard version restricts regeneration felling also on an additional 10% of forest area. These restrictions have great cost implications to forest owners but knowledge on their contribution to sustainable forest management is still incomplete.

3.8 Outputs of Certification in Finland

Very little scientific information is available on the ecological, social, and economic implications of forest certification. Based on interviews with forestry professionals, certification appears to have had a positive impact on the quality of forest management planning and implementation. The following positive impacts on FFCS certification were listed:

1. Environmental values have become an integral part of forest management
   - Water protection receives more attention - less leaching to small waterways
   - Retention trees - amount of decaying wood is increasing
   - Environmental data (key biotopes, sites of selected threatened species, etc.) and restrictions are duly considered in management and operational planning and in practical operations

2. Improvements in forest management and timber production
   - Increased activity in management of sapling stands – improved timber quality and quantity
   - Increased prevention of root rot - improved timber quality and quantity
   - Forest management planning takes into consideration the environmental aspects listed in the standard - information on environmental aspects is available for practical planning

3. Social aspects
   - Training of forestry professionals, contractors, and forest owners has become more systematic - awareness on environmental issues and protection has increased
   - Contractors must provide evidence that statutory fees have been paid – workers receive the social benefits they are entitled to, less distribution in prices as “grey” labour force cannot be used.

Certification has had limited (if any) contribution to:

- recreational values of forest management,
- direct economic benefits to forest owners, because no premiums have been paid for certified timber in Finland, and
- better markets for timber.

3.8.1 Effectiveness and Efficiency of Forest Certification in Finland

Evaluation of the certification arrangements in Finland demonstrates that regional certification has had far more impact on forest management than FMU-based certifications would have had: certification of individual forest holdings would not have reached the large share of certified forest owners the regional certification has. FFCS certification covers actively all parties involved in forest management planning and operations, which further improves the positive impacts of SMS standard in practical forestry.

The SMS standard exceeds the normative requirements but is less demanding than the draft FSC standard. The most significant differences lie in the thresholds for decaying wood, buffer zones and set-aside areas. However, pilot testing of the FSC draft standard indicated that apart from the measures to increase the decaying wood in forests the performance requirements were not very different from the current forest management practices in industrial forests (UPM-Kymmene 2005).

The regional FFCS certification is deemed to be more **effective** in promoting sustainable forestry in the Finnish conditions, because it reaches large forest areas and the whole forestry and timber supply chain has been committed to implement the SMS standard.

In view of the economic **efficiency** in forest certification, the additional costs of standard implementation to forest owners in both systems are considerable. In FSC certification they may reach up to 10-13% of the annual revenues in timber sales, whereas in the FFCS certification according to the SMS standard the cost level remained reasonable (0.95%) (Nuolivirta 2004).

Regional certification initially requires a considerable input when all the forestry organisations and forest owners are informed and trained about the procedures and requirements. The average work input of Forestry Centres and forest owners' organisations during the preparation phase for certification was valued at EUR 252 000 in 1998 (Indufor 2000). Also on an annual basis, training and information costs appear to remain high.

On the other hand, especially organisations representing private non-industrial forestry deem that the benefits from forest certification were perceived positive as a result of improved nature protection. However, no financial benefits have materialized in the markets through price premiums, increased round-wood demand or improved image.

As a conclusion, certification has had a significant positive impact on forest management and it continues to provide a useful tool for forestry organisations in capacity building, planning, implementation, monitoring, and control.

There is a common view that both standard benefit sustainable forest management, but the high cost implications the FSC certification has decreased its accessibility to small-scale forest owners resulting its lower efficiency in enhancing sustainable forest management in Finland.

The comparison results could be summarize as follows:

- appropriateness of the arrangements of SMS led to strong stakeholder commitment. This has ensured a rapid expansion of the certified area and thereby high effectiveness in contribution to achieving SFM.
- both standards represent a higher level of performance requirements than the normative ones.
- some requirements in the FSC standard are higher than in the SMS standard but it is unproven if these differences contribute to better environmental conservation (in the wider sense).
- concerning social aspects, there are many similarities but FSC sets a much higher level of requirements for participation and publicity; under the framework conditions for small-scale private forestry these additional requirements are not considered acceptable or practical by forest owners. On the other hand SMS standards respect the norms on property rights and privacy protection regarding forest owners.
- in the auditing process, the SMS certification tends to emphasise on environmental performance criteria while the FSC certification (only one FMU in the whole country) appears to emphasise on management system elements.
- thorough cost comparisons are not possible but it is apparent that the regional forest certification is a more cost-efficient approach to small-scale private forestry.
- market benefits of certification have been insignificant from the forest owners' point of view.

4 GÄVLEBORG CASE STUDY, SWEDEN

4.1 Policy Objectives in Sweden

In Sweden the government policy objective is to implement forest management that provides high and valuable revenues and maintains environmental values in forests. The forest and environmental policy sets the mandatory and voluntary targets for nature protection in forests. The key policy objective is to protect additional 900 000 hectares of forest to complement the network of existing nature reserves and national parks. The country aims at establishing 400 000 hectares new compulsory nature reserves. The remaining 500 000 hectares are planned to be achieved by voluntary protection in private forests. Private sector has already set aside the targeted hectares in various set-aside areas required e.g. by forest certification but the state is at an initial stage in reaching its target level in forest protection.

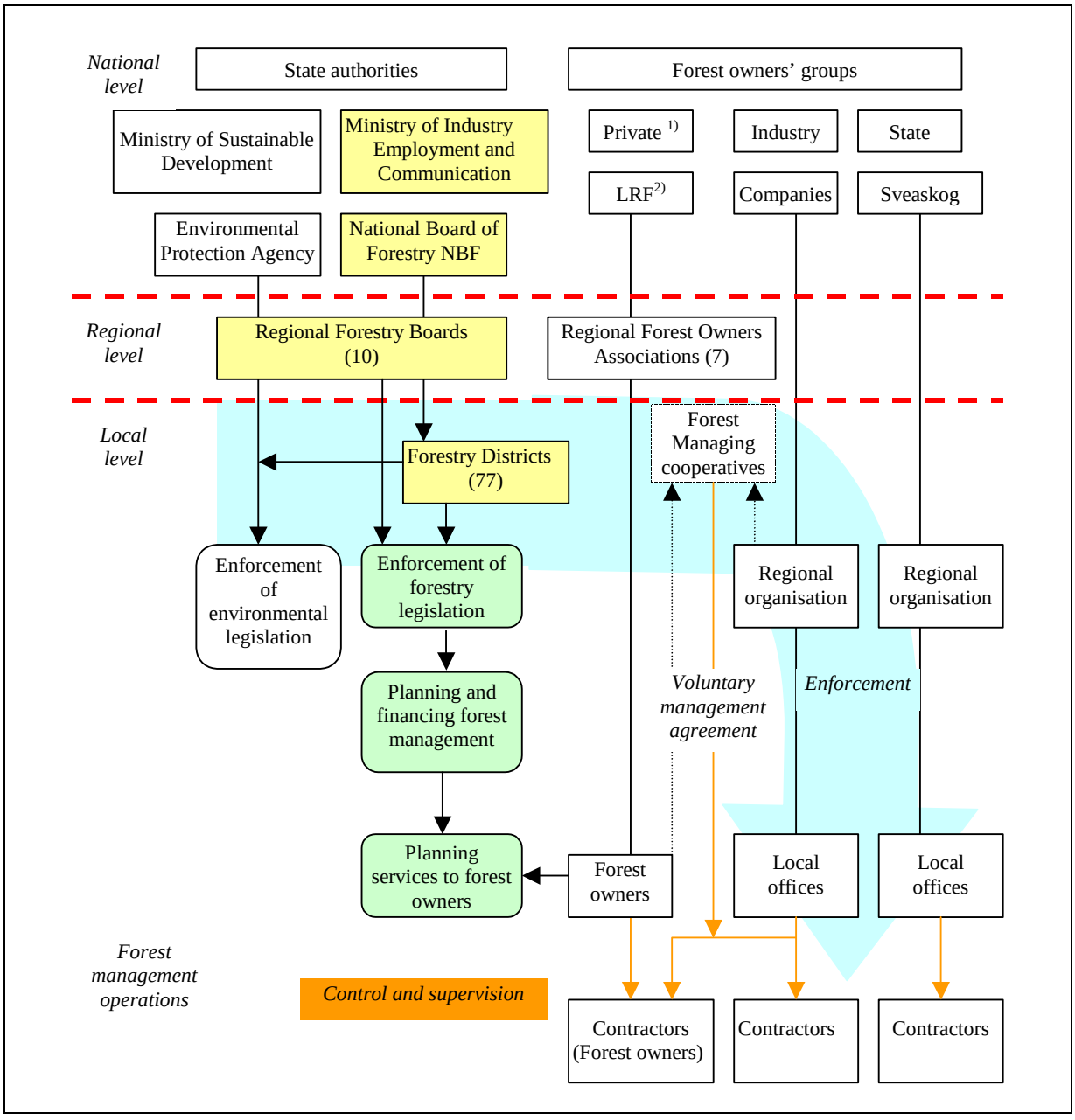
The environmental impact of small set-aside areas (key biotopes and others) in view of forest conservation is generally considered favourable in Sweden, but their overall contribution has been subject to debate.

4.2 Forest Management System in Sweden

The forestry sector falls under the responsibility of the Ministry of Industry, Employment and Communication. Forest policy implementation is designated to the National Board of Forestry that enforces the forest and environmental legislation in forestry activities and provides services to private forestry (Figure 4.1). The Swedish Environmental Protection Agency is responsible for the environmental policy implementation.

At regional level, Regional Forestry Boards coordinate the control, monitoring and improvement activities and guide the local Forestry Districts. All notifications on forest use are verified by the respective Regional Forestry Board.

Figure 4.1 Structure of Forest Management in Sweden



1) Private non-industrial forest owners. 2) LRF Forest Owners

LRF Forest Owners is the national-level cooperative organisation for private non-industrial forest owners. The organisation provides information, training and services to forest owners and lobbies their interests in policy making. The regional offices and local associations also negotiate timber/pulp wood sales and trade timber on behalf of their members. The regional organisations have applied for PEFC group certificates and act as managers in the group certification for private forest owners.

Forest industry companies have their own regional and local organisations. Some companies, e.g. StoraEnso AB and Korsnäs AB, in the Gävleborg county have sold their forests to a holding company (Bergvik Skog AB) established for the purpose to manage forest estates. In this case the processing industry is responsible for the management/harvesting operations only to the level defined in the contract with the owner company. In Sweden the share of industry-owned forests is highest in the three Nordic countries.

Sveaskog manages close to 70% of the state owned forest land. Its main tasks are to own and manage productive state forests according to principles of sustainable forest management. Sveaskog owns about 15% of the productive forests in Sweden. The remaining state forests including protected areas are under government agencies e.g. Environmental Protection Agency and Statens Fastighetsverk.

4.3 Normative Regulations in Sweden

In the 1990s the Swedish forestry and environmental legislation was revised with the objective to issue general acts that define the basic principles for the use and conservation of natural resources. Specifications are given in complementing decrees. At the same time all the subsidies to forestry operations were removed. Today two main laws guide forest management in Sweden:

(i) the Forestry Act (SFS) 1979:429, revised in 1994 and updated in 2002 establishes the basic requirements for forest management and
(ii) the Environmental Code 1998:808 covers the nature protection.

The Decree on Forest Management (SFS) 1993:1096, updated in (SFS) 2004:647 and a number of ministerial decisions set more detailed regulations to forest management. The Forestry Act sets conditions for forest harvesting, maintenance of forest health and the quality of seed and plant material. The main elements are listed below:

(1) Definition of forest land (Sec 1-2). Production capacity of timber production should be over 1 m^3/ha/a
(2) Forest regeneration methods and material (Sec 5-9)
(3) Conditions and restrictions for timber harvesting (Sec 10-13, 15-18)
(4) Forest use notification: forest owner shall inform authorities six weeks before harvesting operations, energy wood collection, supplementary ditching where permission is not required, regeneration and soil scarification methods, and evaluation and consideration of nature and cultural values (sec 14)
(5) Maintenance of valuable broadleaved forests (Sec 22-28)
(6) Protection against insect damages (Sec 29)

(7) Consideration of nature and cultural values, authorities may set detailed restrictions on size and type of forestry operations. Forestry on unproductive land (production capacity < 1 m^3/ha/a) is practically not allowed (Sec 30)
(8) Monitoring and evaluation of the environmental impacts of forest management (Sec 32)

The general rules for environmental protection are given in the Environmental Code (1998:808) that covers the use of natural resources from waters to agricultural fields and forests. It includes general provisions for management of natural resources that have significant implications for forest management. For example, the concept of key biotopes, their inventory and management procedures are not included in the Forestry Act but apply to forestry through the Environmental Code. The basic relevant elements of the Environmental Code include:

(1) Objectives and field of application

(2) Environmental protection
   (a) Protection of habitats for endangered species
   (b) Provisions for consultation with forest authorities when operating on these sites

(3) Environmental protection in certain operations
   (a) Rules for environmentally dangerous operations
   (b) Environmental responsibilities
   (c) Hydropower
   (d) Agriculture
   (e) Gene technology
   (f) Chemicals
   (g) Waste

(4) Supervision

(5) Judicial procedures

Several elements in Chapters 2 and 3 in the Environmental Code have implications for forest management.

The National Board of Forestry controls adherence e.g. to the Forestry Act, the Environmental Code and the Act on Cultural Remains 1988:950. The core legislation applied in forest management is presented in Box 4.1.

Box 4.1 Core Legislation Considered in Forest Management

Forestry Act 1979:429, 1993:553, 2002:614*
Environmental Code 1998:808*
Act on Cultural Remains 1988:950*
Act on Working Environment 1977:1160 and other labour legislation
Hunting and Game Act 1987:259
Act on Chemical Products 1985:426,
Ordinance of Pesticides SFS 1998:947
Ordinance of the Spreading of Pesticides over Forest Land SFS 1985:842
Act on Reindeer husbandry 1971:437*
Work Environment Act SFS 1977:1160
Employment Protection Act SFS 1982:80

* Author's translation. The list is indicative

4.4 Certification Standards in Sweden

4.4.1 Swedish PEFC Standard

The Swedish PEFC standard and system documentation were completed in 1999 and endorsed by the PEFC Council in May 2000. The system documentation was amended in 2002 and 2004. During 2004 the Forestry Standard was revised and in December Standard II was sent to PEFC Council for endorsement. The Swedish PEFC System consists of a Technical Document that includes description of

(i) optional certification levels.
(ii) rights and responsibilities of umbrella organisations (for SFM and chain of custody).
(iii) rights and responsibilities of members in group certification (SFM and chain of custody).
(iv) provisions for direct certification (SFM and chain of custody).
(v) requirements and responsibilities for contractors certified directly or participating in group certification.
(vi) Swedish standard for SFM: Forestry standard, Social standard, Conservation standard.

The Swedish PEFC standard includes seven criteria focusing on quality of forestry operations, ten criteria on social issues and eight criteria on conservation of nature values. These general criteria are complemented by 13 guidelines that set detailed requirements for management system elements in group certifications and also specify the performance required in the criteria.

4.4.2 Swedish FSC Standard

The Swedish FSC Standard was among the first national standards endorsed by FSC. Endorsement took place in 1998 before the FSC International set the normative rules on standard structure. The standard is not grouped under the ten FSC Principles but includes sub-standards covering the following aspects of forest management:

(i) Basic requirements: adherence to national laws, property rights.
(ii) Social standard: indigenous people, labour, local communities.
(iii) Mountain forests: old-growth forest, other nature values.
(iv) Environmental and biodiversity: biotopes, water and soil protection, regeneration, cultural landscapes, planning, rotation time.
(v) Production and economical aspects: multiple use, production.

The revision of the FSC standard was due in 2003, but the work has not been finalized. Forest industry does not agree that the standard revision would imply additional protection requirements. On the other hand, the revised standard should meet the detailed requirements of FSC Principles and Criteria. An agreement on the revised standard was reached in May 2005. This study is based on the current (1998) standard version.

In 2001 forest owners' organisations, forest industry, WWF-Sweden and the Swedish Society for Nature Conservation agreed on the bridging document Stock Dove (Skogsduvan) that listed the differences between the national FSC and PEFC standards. The listed amendments were included in the revised PEFC standard as part of the periodic revision in 2004. With the amendments the revised PEFC and the 1998 FSC standard became fully harmonised.

4.5 Forestry and Forest Certification in Gävleborg County

4.5.1 Forestry

Gävleborg is an important timber production area in Sweden, together with the bordering Dalarnas County. The two regions account for 14% of the Swedish productive woodland (RFB 2003). The forest area in Gävleborg is 1.67 million hectares whereof 1.48 million hectares (88%) is productive forest land (production > 1 m^3/ha/a) (NBF 2004) (Table 4.1). Production oriented forest management is practiced only on productive forest land and unproductive forests (impediment) are practically set-aside areas. Forests are pine (58%) or spruce (42%) dominated. Birch is the only broad leaved species that can form uniform broad-leaved forests in the region.

Table 4.1 Forest Area in Gävleborg County

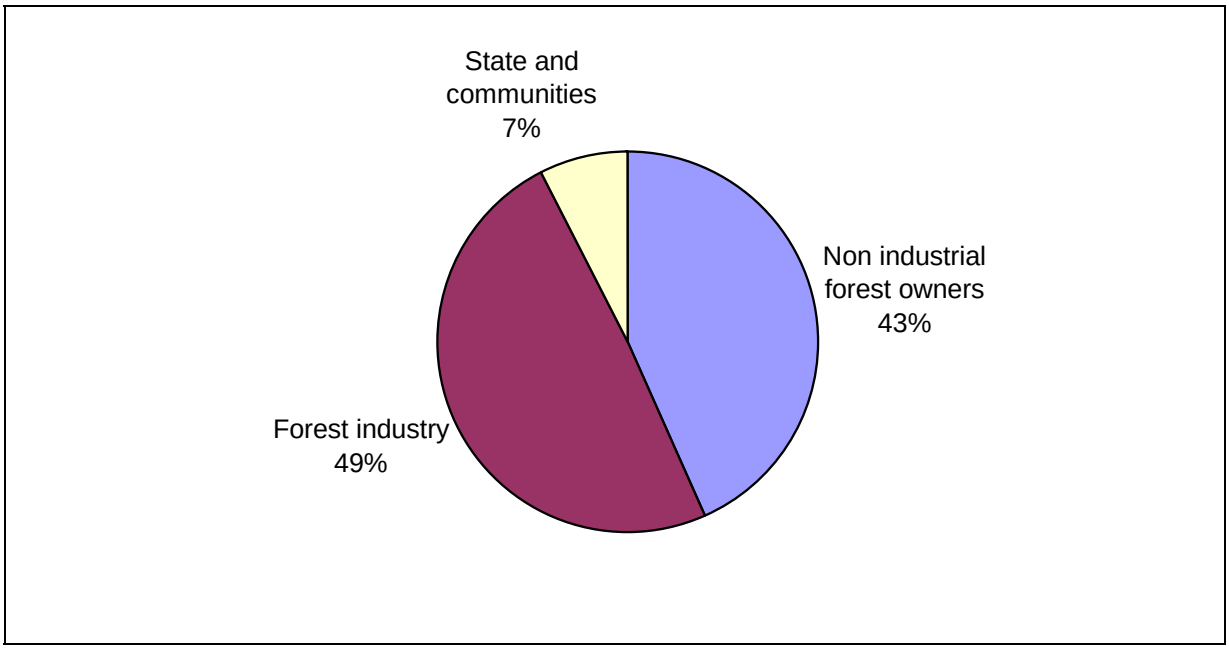
Forest Area	Area (ha)	Share (%)
Total forestry land of Gävleborg County	1 670 000	100
Productive forest and scrub land	1 480 000	88*
Permanently protected area	32 000	2 *
PEFC certified forests	996 400	67**
FSC certified forests	701 900	49**

*Source: NBF 2004, * of total forestry land, **of productive forest land*

Forest industry is the single most significant forest owner in Gävleborg County. The major forest companies include Bergvik Skog AB[8] and Holmen Skog AB. Public forests cover close to 10% of the forest land. Distribution of forest area by different ownership and use categories is presented in Figure 4.2.

A total of 32 044 ha is protected in larger nature reserves of which about 15 000 ha are forested areas (the figure includes productive and unproductive forest land). The total share of protected forest areas in the region is 2% (NBF 2003).

Figure 4.2 Ownership of Productive Forest Land in Gävleborg County



Source: NBF: Swedish Statistical Yearbook of Forestry 2004

4.5.2 Forest Certification

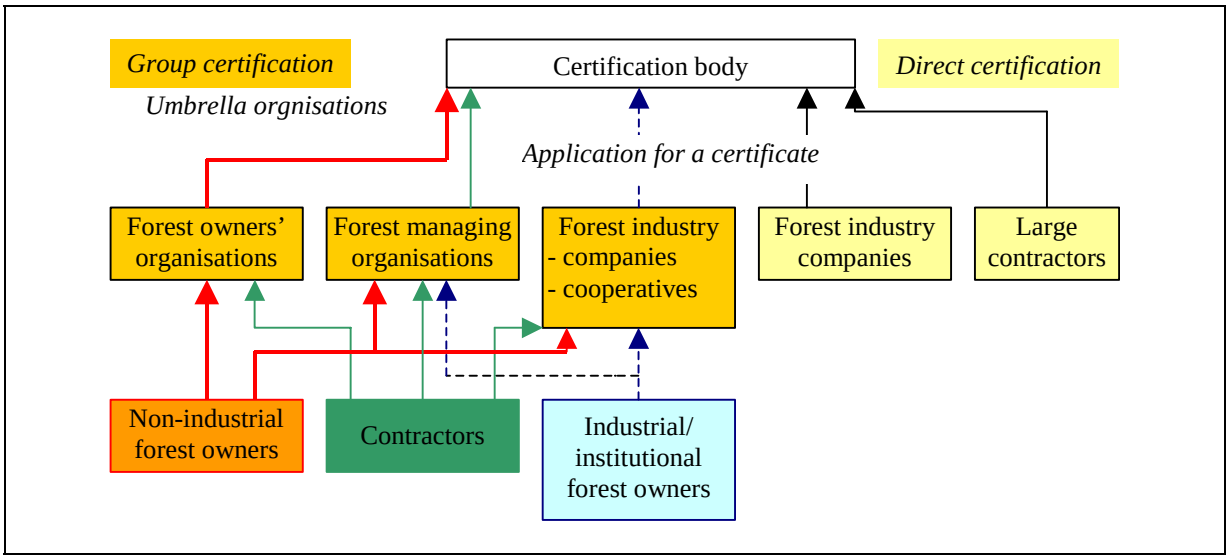
4.5.2.1 PEFC

The Swedish PEFC forest certification system recognises individual certificates and group certificates under an umbrella organisation. There are 14 group certifications and three individual forest certifications under the Swedish PEFC Scheme (*www.pefc.org*). The certification system requires that individual forest owners/companies sign an agreement with the umbrella/group manager organisation that applies for a PEFC group forest certificate. The agreement includes options for annual internal and external audits and provisions for the "Green forest management plan". After signing the agreement with a group manager (organisation) a forest owner may sell certified timber. Membership in a forest owners' organisation is not a precondition for the participation in the group certification managed by the organisation. The Swedish PEFC system also requires that professional contractors join the group certification and comply with the specific environmental requirements set for timber harvesting and transportation.

[8] Joint company managing the former forests of Stora Enso AB and Korsnäs AB in Gävleborg County

The system requires that an umbrella organisation is a legal entity and has a management system under which the group certification system is implemented. The system does not require a full conformity to the ISO 14001 environmental management system standard but most umbrella organisations have taken it as a target. These umbrella organisations have been audited often simultaneously against the PEFC Technical document and ISO 14001 standard. An outline for group and individual certification under the Swedish PEFC system is presented in the Figure 4.3.

Figure 4.3 Examples of Optional Certification Arrangements in the PEFC Certification



Mellanskog forest owners' organisation has the largest PEFC group certification of non-industrial private forest owners in Gävleborg. Mellanskog is a cooperative owned by private non-industrial forest owners. It is also an umbrella organisation under which members and contractors can join to participate in PEFC group certification. Mellanskog provides timber harvesting and trading services for its members and pays currently a price premium for certified timber (about EUR 1/m^3). The organisation may also trade uncertified timber.

The certification covers 461 000 ha of productive forest land and involves 4 078 participants in the Gävleborg County. The average area of one participating FMU is 70 ha, which is larger than the national average for a family forest. The share of certified forest area among all the Mellanskog members is 15% but the certified forest owners are active producers supplying about 30% of the annually harvested timber in the members' forests.

Skogcertifiering Mellansverige AB was established by the regional independent private sawmilling association to build an umbrella organisation and develop PEFC group certification services for independent forest owners and contractors in order to increase the availability of certified timber. Its certificate covers close to 16 000 ha.

There are three types of companies in industrial forestry:

(1) Traditional forest industry companies that are responsible for the ownership, management and wood procurement from their own forests (e.g. Holmen Skog AB).
(2) Companies whose purpose is to own forests and sell felling rights to other companies (e.g. Bergvik Skog AB).
(3) Processing companies that have their own timber procurement/harvesting organisations and buy felling rights from other companies and private forestry organisations (e.g. Stora Enso AB, Korsnäs AB).

In Gävleborg County the PEFC group certification is also common among forest industry. Only Holmen Skog AB and Bergvik Skog AB have applied directly for a PEFC certificate, while the other companies manage a group certification (Table 4.2). The Swedish PEFC requirement to include contractors under a group certification encourages forest industry to establish groups and apply for a group certificate instead of individual certification. All the umbrella organisations for group certification regularly control the performance level in their members' forests and the quality of the contractors work.

4.5.2.2 FSC

The major forest industry companies and Skogssällskapet Förvaltning AB (SFAB)[9] have been FSC certified during the last six to seven years. All the companies are certified against the national Swedish FSC standard**.** In 2004 most of them also received a PEFC certificate and are therefore double certified.

- SFAB manages forests under an agreement with forest owners, mostly institutional owners or large-scale private owners. The organisation has provided FSC group certification services to its clients for several years, but recently it received also the PEFC group certificate and can now provide an option of double certification.
- Bergvik Skog AB manages the former forests of Stora Enso AB and Korsnäs AB. Both companies had FSC-certified forests since 1998. In late 2004 Bergvik Skog received also a PEFC certificate and its forest area is now double certified.
- Holmen Skog had FSC certification in its own forests and they also provide group certification options. Last year the company also received a PEFC certificate for its own forests and is now partly double certified.
- Sveaskog manages most of the state-owned production forests. It has an FSC certificate and has not applied for double certification.

Table 4.2 and Figures 4.4-4.5 illustrate the share and distribution of certified forests.

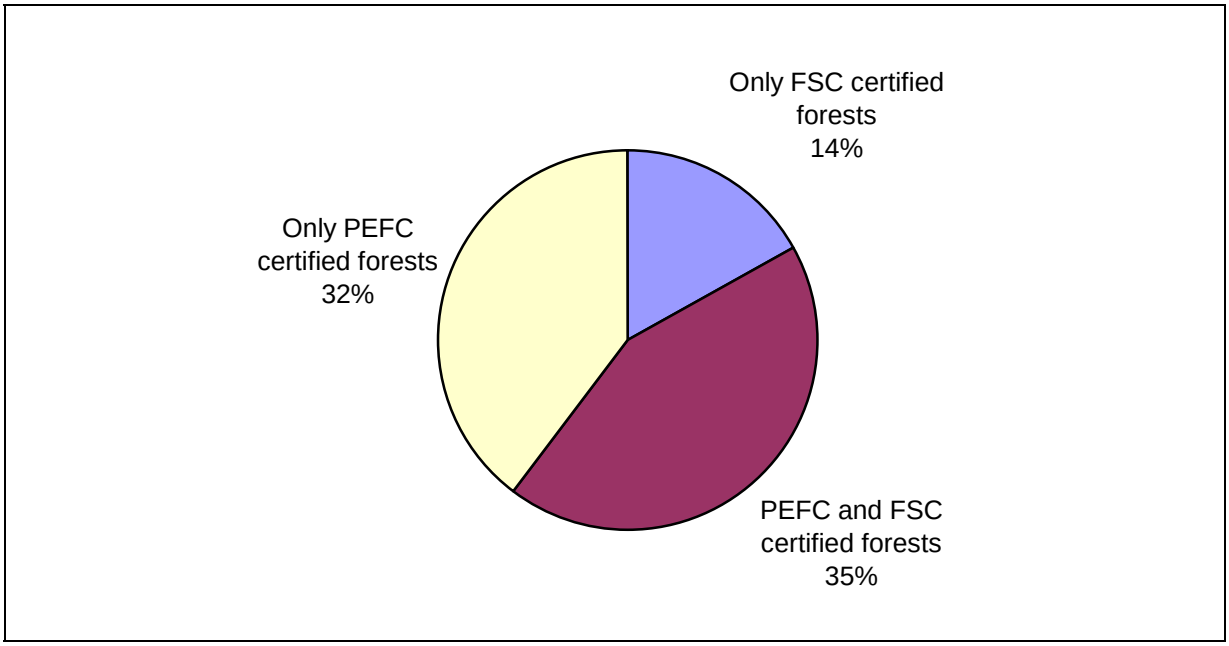
[9] Forest management company

Table 4.2 Area of Certified Productive Forests in Gävleborg

Organisation	PEFC	FSC	Total
	Production forest (ha)		
Mellanskog	461 000	0	461 000
Skogssällskapets Förvaltning	5 180	5349	5 349
Skogscertifiering Mellansverige	15 780	0	15 780
Bergvik Skog	346 290	346 290	346 290
Sandviken Commun*	6 800	6 800	6 800
Korsnäs	4 000	4 000	4 000
Holmen Skog	157 400	157 400	157 400
Sveaskog	0	178 102	178 102
Church	0	26 000	26 000
Total	**996 460**	**723 941**	**1 200 721**

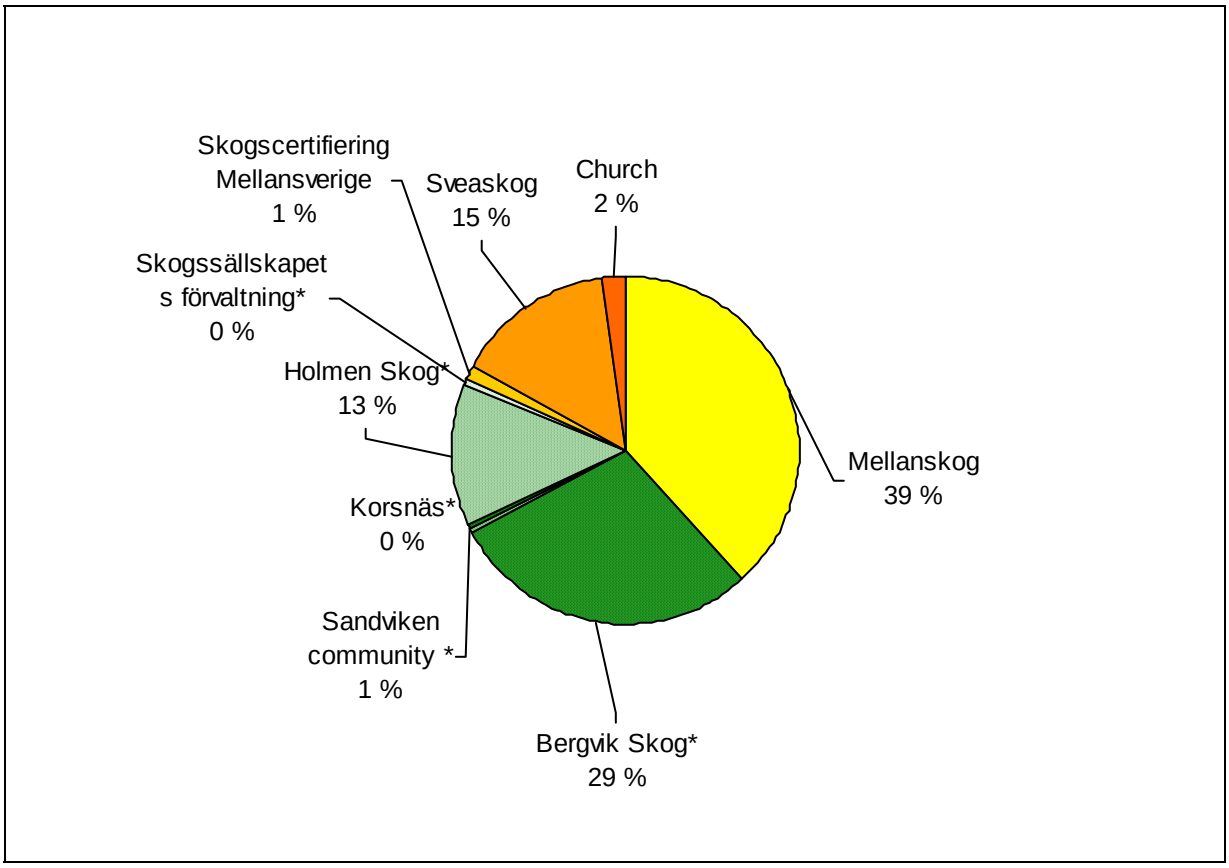
*under Stora Enso Ab's certificate

Figure 4.4 Distribution of Certified Forests in Gävleborg County*



* Share of the total area of productive forest land

Figure 4.5 Certified Forest Area by Certificate Holders in Gävleborg County



* Organisations have both FSC and PEFC certifications for the forests

The overall share of certified forests in the Gävelborgs County's all productive forests is 81%. About 35% of productive forest land has a certificate against PEFC and FSC standards. The forests owned by the state and church are exclusively FSC certified but practically all the remaining FSC certified forests have also a PEFC certificate. The share of FSC certified forests is 49% and that of PEFC certified forests is 67%. The trend has been towards increased double certification, which provides processing industry better possibilities to maximize the production of labelled products and take the full market benefits from the certified timber products. Any possibilities for larger expansion of certified forest area lies in non-industrial private forests.

In most companies double certifications for PEFC and FSC have been based on a single audit carried out by an auditor/group of auditors. This arrangement is possible if the certification body or auditor fulfils any of the following conditions:

(1) Certification body (included its subsidiary companies) have accreditation to FSC and PEFC certification.
(2) Certification body accredited to PEFC certification has a cooperation agreement with a FSC accredited certification body, that approves the FSC audit procedures and audit report and issues the FSC certificate (auditors should have competence for both audits).
(3) Auditor works simultaneously for two different certification companies (accredited to PEFC and FSC certification) and prepares separate reports for both companies.

The arrangement allows effective and well-coordinated double certification and does not set an excessive burden of different types of audits to an organisation. Table 4.3 lists the certification bodies and types of certificates issued for organisations operating in the Gävleborg County. Table 4.3 also lists certification companies that have the competence to both PEFC and FSC audits.

Table 4.3 Certification Bodies and the Issued PEFC and FSC Certificates in Gävleborg County in 2005

Certified organisations	Certifications		Certification bodies
	PEFC Sweden	FSC	
Mellanskog	X	-	SEMKO-DEKRA Certification AB
Bergvik Skog	X	X	DNV Inspection AB/Soil Association, Woodmark*
Stora Enso Ab	X		SP Swedish National Testing and Research Institute (PEFC), Soil Association, Woodmark *
Holmen Skog Ab	X	X	DNV Inspection AB/Soil Association, Woodmark*
Sveaskog		X	SGS, Qualifor
Skogssällskapet förvaltning	X	X	DNV Inspection AB (PEFC) Svensk SkogsCertifiering AB (FSC)
Skogcertifisering Mellansverige	X	-	SEMKO-DEKRA Certification AB

* Information on that same auditor(s) certified against PEFC and FSC standards

4.6 Comparison of Levels of Performance in Certified Forests in Sweden

4.6.1 Scope

The standard comparison is made between (i) the Swedish PEFC Technical Document and normative guiding documents as endorsed in 2000 by PEFC Council (including also the amendments made in 2001 and 2002), and (ii) Swedish national FSC standard as approved by FSC International in 1998 (amended in 2000). The comparison is made within the framework of Pan European Criteria for sustainable management of European forests.

Annex 2 includes a detailed analysis on the differences between the two standards compared to the prevailing normative regulations in Sweden.

4.6.2 Standard Requirements and Legislation in Sweden

4.6.2.1 Criterion 1: Maintenance and Appropriate Enhancement of Forest Resources and Their Contribution to Global Carbon Cycles

(i) Normative Framework

The Forestry Act requires that forests shall produce sustainable good production without sacrificing biological diversity (Sec 1). Forestry operations are in practice allowed only on productive forest land where the annual growth exceeds 1 m^3/ha (Sec 2-3). Forest land can be

converted to other land uses (Sec 10). The normative rules set regulations for the quality of forestry operations in different phases of stand development: regeneration felling, thinning and regeneration etc., and they also require that silvicultural operations are carried out timely.

Forestry operations or infrastructure development are not subsidised in Sweden. Public resources are allocated only to nature protection measures.

(ii) Standard Requirements

- The PEFC standard requirements on maintenance of forest resources rely very much on the normative level. Special emphasis is given to the active profitable forest management according to the normative performance requirements.
- FSC sets more specified FMU-level requirements on balanced age structure and long-term sustainable harvesting levels.
- Carbon is not addressed in either standard.

Box 4.2 Remarks on the Swedish PEFC and FSC Requirements on Forest Resources

Regarding the maintenance of forest resources, the performance requirements in the PEFC and FSC standards do not exceed significantly the normative requirements. The FSC requirements are more specific at a FMU level and specifically require a balanced age class distribution, which is also a precondition for the adherence to the normative objective on sustainable yield. The differences between the standards do not have practical significance.

4.6.2.2 Criterion 2: Maintenance of Forest Health

(i) Normative Framework

The normative regulations on forest health focus on insect and fungal damages. Forest owners shall prevent damages and inform authorities on the occurrences of listed damage agents (Forestry Act Sec 29, Act on Plant Protection Sec 4).

(ii) Standard Requirements

- PEFC requires preventive measures to protect forests from damages as requested by authorities (National Board of Forestry). The PEFC standard requires inputs in training on precautionary measures.
- Accordingly FSC requires that risks for biotic and abiotic (wind, temperature, drought, fire, etc.) damages shall be taken into consideration in all forest management activities.
- FSC addresses also the prevention of game damages and demands that adequate coppice forests are available for game in order to protect species sensitive to browsing.

Box 4.3 Remarks on the Swedish PEFC and FSC Requirements on Forest Health

Regarding the maintenance of forest health FSC and PEFC standards require active prevention of damages including training. The performance requirements exceed slightly the normative ones.

4.6.2.3 Criterion 3: Maintenance and Encouragement of Productive Functions of Forests (wood and non-wood)

(i) Normative Framework

According to the Forestry Act forests shall provide sustainable yield (Sec 1) and harvesting shall aim at regeneration or improvement of stands (Sec 10). Legislation sets also general rules on the size of regeneration felling areas: the area shall not exceed half of the area of a FMU in one community, authorities may also set upper limits for annual harvested areas for large FMUs (> 1 000 ha).

Forest owners shall give a forest use notification six weeks before the planned operation. Practically no forest operations are allowed on unproductive forest land (growth <1 m^3/ha/a). A permission for harvesting is required e.g. in mountain forests, sites that are difficult to regenerate, and for any operations in biologically valuable habitats.

All forest owners should prepare a Conservation Document where the basic forest information and data on environmentally and culturally valuable sites are reported. Normative regulations do not require a FMU level forest management plan and the voluntary plans are considered as guiding documents that can be changed during their period of their validity.

No specific provisions are given for the production of non-wood forest products except game and fishery where the respective legislation applies.

(ii) Standard Requirements

(a) Forest Management Plan

- Both FSC and PEFC standards require that all participants in forest certification shall have or develop an environmentally oriented (green) forest management plan within five years from the signing of a certification contract. There is a common understanding on the content of the plan.
- PEFC states that the normative Conservation Document applies during the transition period.
- The FSC standard requires that, in the absence of the plan, nature values shall be assessed before every operation.
- FSC and PEFC require that larger forest owners (> 5 000 ha) shall carry out landscape ecological planning that, includes some elements of participatory planning at a local level.
- FSC address selective cutting on specified sites and sustainable harvesting levels, whereas PEFC sets a general provision on active and profitable forestry.

(b) Wood and Non-wood Products

- The PEFC standard does not set specific requirements for non-wood products. The issue is covered through a reference to the common law on free access to forests and right to collect berries and mushroom.
- The FSC standard includes a general requirement to promote multiple use of forests.

Box 4.4 Remarks on the Swedish PEFC and FSC Requirements on Timber and Non-Wood Production

Regarding timber production methods the FSC and PEFC standards are largely at the normative level. Neither of them have strong provisions to intensify timber production with silvicultural measures. Requirements on forest management planning exceed the normative level (Green plan) and are harmonized between the two standards.

Regarding the production of non-wood products, the two standards do not set any requirements exceeding the prevailing normative rules.

4.6.2.4 Criterion 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems

(i) Normative Framework

Environmental legislation is compiled under the Environmental Code where selected parts apply to forest management and are enforced by the National Board of Forestry. On productive forest land key biotopes (biologically valuable habitats) and other habitats of protected species (as defined e.g. in the respective EU directives) and valuable broadleaved stands shall be set aside. Different types of biotopes are listed in Table 4.4.

Table 4.4 Key Biotopes* Protected by the Environmental Code

1	Burned areas
2	Burned areas with new growth of broad leaved tree species
3	Older forests with natural characteristics
4	Mesic herb-rich alder forests
5	Natural forests in gorges and gullies
6	Small waterbodies and adjacent forests
7	Herb-rich mesic forest
8	Older forests on sediment soil
9	Older forest with marks of pasturing
10	Natural forests on calcareous soil
11	Rich and calcareous mire
12	Alder swamp forests
13	Hazel-type herb rich forest
14	Springs and immediate surroundings
15	Heath land islets surrounded by virgin mires
16	Open rock areas
17	Forests with very old trees
18	Alluvial forests

* Author's translation

The National Board of Forestry has carried out a key biotope inventory in private forests. In Gävleborg County these biotopes occupy 0.9% of productive private forest land. The site information on biotopes is registered and it is available when the authorities verify the appropriateness of forest use notification. The forest owner is obliged to consult with the Regional Board of Forestry for any planned forestry activities in these biotopes. The size of one biotope varies usually between 0.5 to 5.0 hectares.

The National Board of Forestry can establish biotope protection areas for the most valuable biotopes which provide habitats for endangered species. Forest owners get compensation for the future value of their timber on these sites, but the area remains as a private property. By the year 2003 close to 176 biotope protection areas were established in Gävleborg and they cover 706 hectares (12% of the key-biotopes in private forests)[10]. The biotope protection areas may be up to 5 ha, for larger valuable sites (up to 25 ha) nature protection contracts for up to 50 years that can provide compensation for the loss of the standing timber.

Forest industry companies have carried out biotope surveys in their own forests. These biologically valuable habitats cover about 3% of the productive forest land in Gävleborg.

Special provisions apply also to mountain forests. The Forestry Act gives authorities the right to set provisions, due to environmental or cultural values, on the size of harvested area, regeneration methods, quality of seed trees, fertilization, draining and road construction.

The National Board of Forestry has an extensive site-specific database on key-biotopes, occurrence of endangered species, culturally valuable sites, protection areas, etc. Possible location of planned harvesting operations on the listed sites is verified in each harvesting notification.

(ii) Standard Requirements

(a) Rare Ecosystems -ancient forests, protected forests, rehabilitation of degraded areas

Both FSC and PEFC standards require that 5% of the productive forest land in a forest management unit is set aside for biodiversity protection.

The set aside area may include

- key biotopes
- nature conservation areas defined in the agreement with the National Board of Forestry
- wetland forests
- private nature reserves, Natura 2000 and other areas (for which compensation is not paid)
- other areas of special attention (FSC lists different types in detail)

In the “Green forest management plans” forests are classified into the following areas:

- no intervention (NO)
- nature management (NS)
- multiple use (K)
- special attention (PF)
- production forests (PG)

The set-aside areas should be selected from the NS or NO category forests. Forest industry and private forest owners set the target to the 5% but monitoring results indicate that in practice the set-aside areas cover about 8-10% of the productive forest land.

[10] Interview with Regional Forestry Board in Dalarna-Gävleborg, 2005

Box 4.5 Remarks on the Swedish PEFC and FSC Requirements on the Protection of Biologically Valuable Habitats

The FSC and PEFC standard requirements to set aside 5% of productive forest land exceeds the normative level. The share of key biotopes is between 1 to 3% and the rest would be buffer zones, or other valuable habitats. The actual set-aside areas are reported to reach 8-10% of productive forest land in private and industrial forests. In addition, all unproductive forest land that is not for timber production (about 12% of forestry land in the County) would have to be added.

The area of protected habitats and set-aside areas exceed significantly the normative regulations. The approach to set aside forests at the FMU level was considered beneficial to the enhancement of biodiversity.

(b) Threatened Species

- Protection of threatened species is implemented through protection of key biotopes and known occurrences of these species as registered in the data bases of the County administration and the National Board of Forestry.
- The FSC and PEFC standards rely on this approach but also require protection of biologically valuable trees, e.g., large oak or beech trees or other broad-leaved or pine trees that during the slow dying and decaying process are biologically valuable.
- The FSC standard addresses the creation of habitats for species dependent on burned wood and requires increase in prescribed burning on large forest holdings (5% of annual mesic and dry regeneration areas shall be burned).

Box 4.6 Remarks on the Swedish PEFC and FSC Standard on the Protection of Threatened Species

On the protection of the threatened species both standards rely on the normative level where species protection is done through key-biotope protection and protection of the known habitats of these species. The higher share of set-aside areas (5%) contribute additionally to the species protection. Requirement to protect trees worthwhile for conservation exceeds the normative level.

FSC requires the creation of habitats for species dependent on burned wood through prescribed burning, which exceeds the normative level.

(c) Biological Diversity in Production Forests - genetic and species diversity, regeneration

- On the use of exotic species the PEFC standard relies on legislation that allows their use only in exceptional cases. FSC requires in addition a consensus decision from FSC Sweden before these species can be used. FSC also sets restrictions for the share of spruce forests outside their natural growing area.
- Both standards require a minimum share of hardwood species where biologically feasible. The minimum shares are 5-10% in PEFC and 5-20% in FSC standards. By both standards 5% of the mesic to moist forest land should be hardwood dominated.
- FSC requires ten retention trees/ha throughout the country whereas PEFC standard asks for to 5 to 10 trees/ha in Central Sweden and 5 trees/ha in the North. In the revised PEFC standard ten trees per hectare should be left throughout the country. In Gävleborg County

the monitoring results indicated that the number of retention trees exceeded the 5 trees in hectare also in the private forests that were exclusively PEFC certified.

- The target level of dead wood in forest is 3 m^3/ha in FSC and 2-3 m^3/ha in the PEFC standard. FSC requires active measures to increase the volume of dead wood; in practice up to three high stubs are left per hectare, although such a requirement is not stated in the standard.
- On the regeneration requirement and origin of seeding material, as well as on the use of gene modified organisms, both standards rely on the normative level.
- FSC states that collection of biofuel shall not risk biological diversity or soil functions, which is slightly more demanding than the normative requirement to notify on the planned collection area.

Box 4.7 Remarks on the Swedish PEFC and FSC Requirements on Species Selection and Regeneration

On genetic and species diversity and forest regeneration the FSC and PEFC standards are largely at the normative level. The requirements for mixed stands and production of dead, decaying wood exceed the normative level but there is only little difference in the performance requirements between the two standards. FSC requires active measures to create decaying wood and is stricter in limiting the share of spruce forests outside their natural range of distribution.

4.6.2.5 Criterion 5: Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)

(i) Normative Framework

The Environmental Code sets general provisions for soil and water conservation. It specifies that use of chemicals and fertilizers shall be consulted with authorities, e.g., the National Board of Forestry, prior to their use in the field.

The basic approach is that forest management shall not cause damage to water ecosystems (EU Water Framework Directive, Environmental Code) or to soils.

(ii) Standard Requirements (Soil)

- The FSC standard requires that forest owners demonstrate that changes in nitrogen balance or collection of harvesting residues do not damage the natural processes and production capacity of the soil.
- Both standards require minimization of soil damages and FSC allows soil scarification only on sites where it is necessary for successful regeneration. By regulation soil scarification is an activity that shall be reported to the National Board of Forestry, which assesses whether the proposed method is adequate and appropriate.

(iii) Standard Requirements (Water)

- Both FSC and PEFC standards require precautionary measures when planning or implementing operations in the vicinity of water bodies. The PEFC standard requires that contractors use bio-degradable oils whenever possible. Both standards set comparable requirements for buffer zones.
- FSC specifically prohibits first-time drainage. Any first-time drainage operations should be reported in any case to the National Board of Forestry prior to their implementation.
- The use of chemicals shall be minimized but is not completely prohibited in either standard.

Box 4.8 Remarks on the Swedish PEFC and FSC Requirements on the Soil and Water Protection

On soil protection the FSC standard is broader than PEFC in focusing also on the biological functions of forests. In general both standards require appropriate working methods that prevent unnecessary damages.

In practical forest management and planning, the performance requirements of FSC and PEFC emphasise precautionary measures but performance requirements are based on the existing legislation. FSC restricts drainage, which in any case is strictly controlled. PEFC provision on the use of biodegradable oils for forest machinery has larger scale implications.

4.6.2.6 Criterion 6: Maintenance of Socio-Economic and Cultural Functions and Conditions

(i) Normative Framework

The Forestry Act requires that public interests shall be taken into consideration in forest management along with timber production and biodiversity conservation.

Labour legislation is advanced in Sweden and well enforced. Procedures for bargaining collective labour agreements are also well developed.

Sweden has the common law on free access to forests, which is defined in the Environmental Code.

Forest authorities have good site-specific databases on biologically valuable sites, historical monuments and cultural landscapes. If a planned harvesting area includes any of the special sites, forest owners consult authorities before the operations.

(ii) Standard Requirements

(a) Economic significance and infrastructure

- The FSC and PEFC standards set general provisions for the need to practice active and economically feasible forest management. PEFC emphasizes at a general level that forest management should contribute to the rural development.
- Neither standard addresses the development of the forest infrastructure.

Box 4.9 Remarks on the Swedish PEFC and FSC Requirements on the Contribution of Forestry to Local Economy

The FSC and PEFC standards do not address broadly the economic significance of forest management in general or to local communities. Compared to the Forestry Act the general provisions for active and economically feasible forest management exceed slightly the normative level.

(b) Recreation and the rights of indigenous people

- Recreation is based on the free access to forests. Neither standard sets additional requirements for the enhancement of recreational values.
- The PEFC standard requires that Sami people and reindeer herding shall be taken into consideration according to the Family Enterprise Forestry and Reindeer Herding Policy (1999). The policy does not include annual consultation with reindeer herding cooperatives (Sami villages) as the implementation of the FSC standard requires.
- The FSC standard adheres to the Forestry Act in participatory processes on reindeer herding areas. It also demands that lichen forests shall be protected for reindeers. All forest management shall take fully into consideration the multiple use of forests.

Box 4.10 Remarks on the Swedish PEFC and FSC Requirements on the Multiple Use of Forests

On the multiple use of forests PEFC relies on the common law on free access, whereas FSC makes a general statement that these values shall be taken into consideration at a FMU level. There is no significant difference between the standards in this respect.

Although widely discussed the standards do not set requirements significantly exceeding the normative level for the consideration of reindeer husbandry in forest management. However, the normative provision on cooperation has been interpreted in the FSC certification to include annual consultations with reindeer herding cooperatives on practical forest management. Private forest owners have deemed this requirement and its consequences unfeasible.

(c) Employment

- Both FSC and PEFC standards require full adherence to the laws, regulations, agreements and good practices of the Swedish labour market.
- According to the PEFC standard only contractors that belong to the group certification and adhere to the relevant standard requirements may be hired. FSC does not require contractors to participate in certification but adherence to the standard requirements is necessary.
- The FSC and PEFC standards also set provisions for staff qualifications and skills enhancement.
- The employment standards do not apply to family forestry with no hired employees.

Box 4.11 Remarks on the Swedish PEFC and FSC Requirements the Employment in Forestry

The PEFC standards is more rigid on labour issues in demanding that contractors are members of a group certification and therefore also subjects of annual internal and external audits. Requirements in both standards exceed slightly the normative rules.

(d) Public awareness and participation, cultural values

- Both standards rely on the Act on Cultural Monuments in specifying protection of ancient monuments and cultural sites.
- The FSC standard is more detailed on protection of cultural landscape and maintenance of open former pasture lands.
- On awareness raising the PEFC standard emphasises training of forest owners and contractors whereas FSC focuses on the publicity of the information on biologically valuable sites.
- Landscape ecological planning with a participatory approach is required by both standards for large forest holdings (over 5 000 ha).
- The FSC standard in addition requires the use of new and unproven methods or materials be recognised by the FSC Sweden prior to their implementation.

Box 4.12 Remarks on the Swedish PEFC and FSC Requirements on Consideration of Cultural Values and Stakeholder Participation

The PEFC standard largely relies on normative rules on the protection of cultural heritage. The FSC standard sets specific requirements for the maintenance of open cultural landscape and border lines.

The FSC standard requires a broader participation than the PEFC standard on larger forest holdings and is more restrictive in the introduction of new methods to forestry. FSC Sweden maintains a right of veto in the recognition of new methods in the FSC certified forestry.

4.6.3 Summary of the Evaluation of the Swedish FSC and PEFC Standards

The independent evaluation process Stock Dove comparing the Swedish PEFC and FSC standards in 2001 concluded that the FSC standard is more comprehensive and detailed than the PEFC standard (Skogsduvan 2001). The project proposed 17 amendments to the PEFC standard and four to the FSC standard in order to reach a full harmonization between the standards. The amendments are taken into consideration in the revised PEFC standard in 2005 and partly already in the earlier revisions. The amendments focused on the following aspects (Skogsduvan 2001):

- Preservation of older forests
- Preservation of biologically valuable habitats
- Specifications on the use of fertilizers
- Prescribed burning
- Origin of plant and seed material
- Landscape ecological planning on larger forest estates (> 5 000 ha)

- Hunting, development of broad-leaved trees on areas with high game stocks
- Specifications for the minimization the use of chemicals
- Maps on valuable habitats

The four amendments proposed to the FSC standard focused on the following aspects:

- Competence requirements for forest workers
- Target oriented forest management, timber processing and marketing that benefits local communities
- Valuable retention trees
- Target share for broadleaved forest stands

The amendments are fully taken into consideration in the 2005 revised PEFC standard.

Although the FSC and PEFC standards aim at environmentally, economically and socially sustainable forest management, the interviewed parties considered that environmental protection has been the major objective in standard setting and forest certification in Sweden. In environmental protection both standards contribute to the safeguarding of rare ecosystems, which is the key strategy for the protection of threatened species. The standards improve forest management also with regard to soil and water protection.

Both certification standards exceed the normative performance requirements in a number of aspects and further specify the provisions remaining at a normative level. In non-wood products and recreational use of forests neither standards set more sophisticated requirements. The FSC standard is slightly more demanding especially in participatory approaches in forest management planning and in identification and protection of threatened species. It also sets detailed requirements for the timber production methods. PEFC is more rigid towards contractors who shall also be assessed during a group certification if working in certified forests. Companies/organisations acting as group managers in certification regularly audit contractors.

4.6.4 Audit Results in Gävleborg County

All audits studied during the evaluation listed non-conformities (NC) and recommendations. Available audit reports from the years 2002-2004 were reviewed and the identified non-conformities were grouped according to their type. In forest industry the PEFC audits were first done in 2004 and this study focused on the current differences in non-conformities between the schemes.

All non-conformities issued in FSC and PEFC forest management certifications were minor and did not cause suspension of the certificate if corrective actions were taken within the agreed time schedule. The trend on the number of non-conformities has been decreasing.

The number of non-conformities in FSC audits varied from three to seven for the area covered by a certificate[11]. It was typical that non-conformities in subsequent audits focused on the same issues, e.g. on the quality and quantity of set-aside areas and on the measures to increase

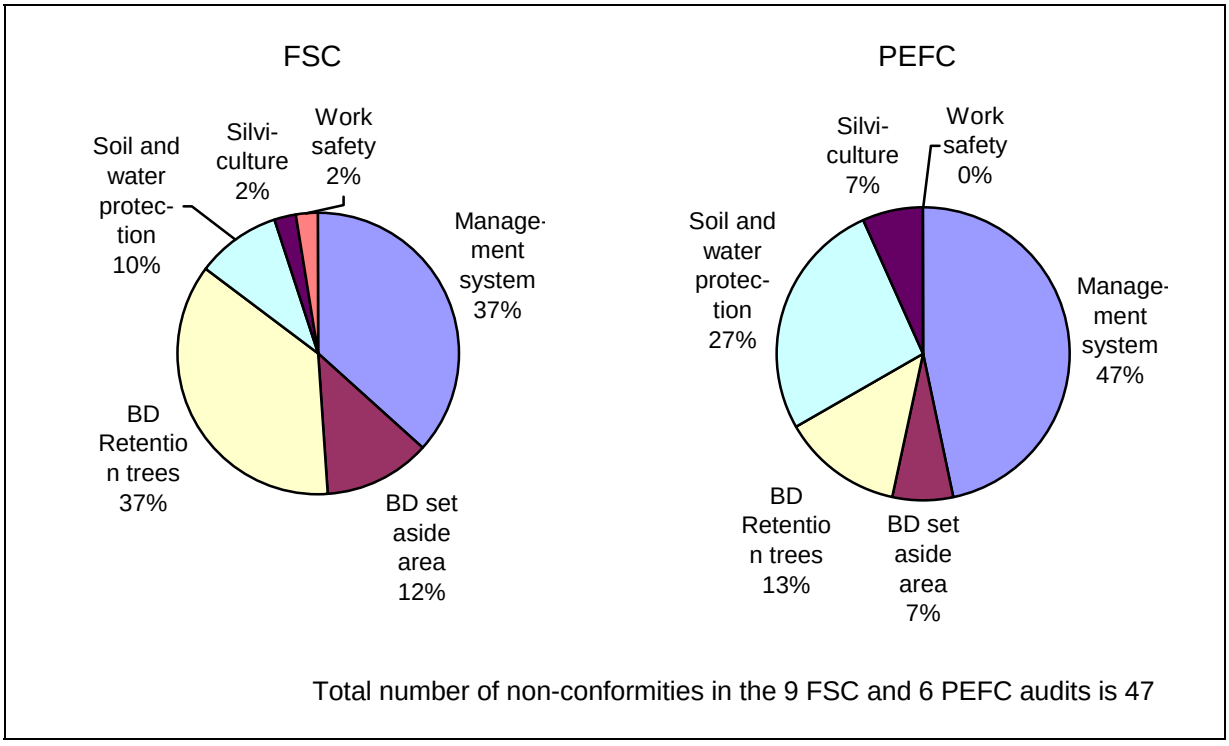
[11] Gävleborg County counted only for a small share of the certified forest area for all certified organisations

dead wood in forests. Thus some non-conformities remained open from an audit to another, which is typical in group certifications with a large number of operations and actors.

The recently PEFC certified forest industry had already experience in FSC and ISO 14001 certifications. The number of non-conformities in forest management was limited to three to four cases per audit. In internal audits their number was higher varying from 2 to 23, and most of them were corrected before external audits, which explains partly the low number of non-conformities in some group certifications.

All the non-conformities issued in the audits during 2002-2004 were classified into "management or performance requirements" and further subclasses (Figure 4.6). The management system non-conformities were related either to (i) documentation, (e.g. membership registers, mapping information on reindeer herding areas and other data), (ii) procedures, (e.g. consultation or information), or (iii) guidelines and their quality and updating whereas performance requirements addressed specific aspects in forest management or nature protection.

Figure 4.6 Distribution of Non-conformities in Selected FSC and PEFC Audits in 2002-2004



Source: Audit results from Bervik Skog (2004 FSC/PEFC), StoraEnso (2004 FSC/PEFC), Korsnäs (2002, 2003 FSC, 2004 FSC/PEFC), Holmen Skog (2003 FSC), SFAB (FSC 2001, 2003), Sveaskog (2003 FSC), Mellanskog (2002-2004 PEFC)

The limited data suggests that the share of management system non-conformities was higher in PEFC certification (47%) compared to 37% in FSC certification (Figure 4.6). A reason for the higher number of management system non-conformities is that the PEFC group certification is based on a management system that requires internal revisions at the group and

local levels. Often the non-conformities, especially in the internal revisions, were formulated as a management system type non-conformities. This approach demands positive corrective actions in the group/FMU level management and lead to systematic improvement throughout the group organisation.

The PEFC management system non-conformities focused on verification of contractors' competence on which the Swedish PEFC standard is very strict, as well as on guidelines for, and control and use of chemicals and the use of machinery in the vicinity of water bodies. A unsatisfactory performance on these issues were classified as non-conformities related to water and soil protection. Retention trees were also addressed in the PEFC audit non-conformities.

The FSC level management system non-conformities were issued mostly due to inadequate guidance documentation or missing elements in agreements or registers. In performance requirements most FSC non-conformities focused on the biologically valuable trees, inadequate measures to increase dead wood and retention trees. There were also shortcomings to reach the target share of valuable set-aside areas.

Based on the limited data it seems that these issues are problematic especially in group certifications for small non-industrial FMUs. The 5% target for set-aside areas are assessed in group certification at a FMU level whereas in forest industry the target can be reached at a regional level and the share may be lower at a district level. The challenge for information and training is great when operating with hundreds of private forest owners.

Table 4.5 lists a summary of the non-conformities identified in 2004 in all PEFC and FSC certifications in five organisations operating in the Gävleborg County.

Common to both PEFC and FSC audits was that practically no non-conformities were issued on measures to promote timber production (economic sustainability) although both standards set such provisions. Audits have been strongly focusing on the environmental issues although recently auditors also have brought up issues related timber production.

Table 4.5 Summary of the Distribution of Non-conformities in Selected Audits in 2004

Object of non-conformity (*)	Number	
	PEFC	FSC
Management system elements		
1. Documentation; e.g. registers, data on special areas, content of plans	0	0
2. Procedures; e.g. agreements, recruitment, management, consultation	5	0
3. Guidelines	2	0
Performance elements		
1. Biodiversity; set aside areas, their quality, quantity, management	1	2
2. Biodiversity; decaying wood, valuable trees	1	4
3. Soil and water protection	3	2
4. Silviculture and harvesting operations	0	0
5. Health and safety in work	0	1
Total	**12**	**8**

Note: Based on available information from Bergvik Skog AB, Korsnäs Ab, Stora Enso AB, SFAB, Mellanskog.
(*) All non-conformities in forest management were minor

4.7 Certification Costs in Gävleborg County

The structure of the certification costs is presented in the Chapter 2.3.

Only few organisations monitor costs related to certification in Gävleborg. As explained by a representative of the largest PEFC group certification organisation under Mellanskog, "awareness raising and training on sustainable forest management has been an integral part of the organisation's work for the past ten years and separating costs related only to certification is impossible". Forest industry does not either separate costs of FSC and PEFC certifications in their processes. Therefore, the certification costs presented below are based on estimations given by three organisations representing private forestry and forest industry.

4.7.1 PEFC

PEFC certification represents group certification costs for private forest owners (Table 4.6). The given costs are based on one available case and should be interpreted as indicative only. Most private forest owners belong to group certifications managed by forest owners' organisations or timber processing cooperatives linked to family forestry. The certificate holder makes an agreement with each member in the certification group and audits annually forest management among 15-20% of their members, which raises the internal audit costs to a significant level. The larger and more significant timber producing FMUs are audited annually.

The certificate holders carry out extensive internal audits that cover their own activities as well as those of their contractors. The staffs in each company spend up to 80 days in internal audits. In addition, field auditors, with a work input of about 120 days, may be employed during summer to verify the conformance to the company rules in forests.

Table 4.6 Estimated Cost of PEFC Certification in a Forest Owners' Group Certification in Gävleborg County

	EUR/ha (*)	EUR/a	%
Direct costs			
External audit	0.08	2 200	8.0
Internal audit	0.38	11 000	40.1
	0.46	13 200	48.1
Indirect costs			
Organisational costs	0.50	14 200	51.9
Loss of stumpage revenues (**)	..	..	..
	0.50	14 200	51.9
Total	0.96	27 400	100.0

(*) Per certified forest area in a certification of 28 600 ha, (**) information not available

LRF Forest Owners estimated that the costs of PEFC standard implementation correspond to a 13-15% decrease in the annual timber sales compared to the situation where certification would not be implemented.

External audits in companies usually take about 5-6 days. The companies use auditors that have a mandate to audit against both the FSC and PEFC standards in a single audit. Often, the conformity with ISO 14001 is audited simultaneously.

Information on the costs of the exclusive FSC certification was not available for the assessment.

4.7.2 Joint Auditing of FSC and PEFC Requirements

Table 4.7 shows estimates for the certification costs in industrial forestry in joint auditing for FSC and PEFC certification. Membership fees for the national PEFC or FSC bodies are not taken into consideration.

Table 4.7 Estimated Costs of Certification in Industrial Forestry in Gävleborg County through Joint Auditing of FSC and PEFC Requirements

	EUR/ha (*)	EUR/a	%
Direct costs			
External audit	0.01	29 600	0.1
Internal audit	0.04	76 700	0.3
	0.05	106 300	0.4
Indirect costs			
Organisational costs	..	..	..
Loss of stumpage revenues (**)	13.50	27 000 000	99.6
	13.50	27 000 000	99.6
Total	13.55	27 106 300	100.0

(*) Per productive forest area in a certification of about 2 million ha. (**) Based on the assumption that the areas set aside and restrictions in harvesting imply a 13% decrease in the harvesting level.

The interviewed organisations estimated that, in addition to the 5% set-aside area required by the PEFC and FSC standards, buffer zones and other valuable areas count for an additional 3 to 6% of the productive forest land. The value of retention trees and harvesting restrictions on set-aside areas cause about 13% decrease in the annual allowable harvest. FSC is slightly more demanding in the set-aside areas but in the joint certification the difference in costs cannot be revealed.

Although Table 4.6 and Table 4.7 (see also Table 3.5) are not fully comparable, they show clearly that audit costs per hectare decreases dramatically as the certified area increases (from EUR 0.46/ha to 0.05/ha). Also the indirect organisational costs follow the same trend. If the value of environmental investment in reduced harvesting potential is taken into consideration, the size of the certified area has less significance in the total costs.

4.7.3 Price Premiums

Price premiums for certified timber have been paid in Sweden to attract forest owners to participate in group certification, especially to PEFC. Currently, four forest owners' organizations (Södra, Mellanskog, Norrskog and Norra Skogsägarna) trading timber from private forests pay a premium of about one euro per m^3 for certified timber. A number of sawmills have also paid corresponding premiums for certified timber. This represents about 2% of the value of timber at roadside.

In forest owners' organisations view, price premiums are an essential and effective incentive that encourages forest owners to embark on the effort and make the personal investment that certification requires in form of e.g. improved nature protection. Additional benefits, e.g. support for green forest management planning, are also used to facilitate forest owners' participation in certification.

4.7.4 Conclusions on the Cost Analysis

Forest certification in Sweden requires a significant environmental investment from forest owners compared to the normative level. Direct economical benefits of forest certification are difficult to define and all benefits and costs should be evaluated in a larger context covering timber production, processing and markets.

Information of the internal costs of FSC group-certification has not been available, because it has been implemented only in large-scale forestry in the Gävleborg County. In PEFC certification the internal audit costs are significant in Sweden due to the applied group certification models among private non-industrial FMUs, but systematic internal control contributes to the improved quality of PEFC certified forest management. Internal costs are more accepted than similar external costs because the inputs aim at improving the forest owners'/industry's management and performance. External audit costs are not a significant component even in double certifications.

The following conclusions on the inputs can be drawn:

- The PEFC group certification arrangements keep the audit costs reasonable for non-industrial forest owners.
- Resource demanding but efficient internal audits, increase the credibility of certification, which benefits both forest owners and forest industry.
- Well-streamlined double certification also provides a variety of certified fibre which industry can process and label to meet the diverse market demands of PEFC or FSC certified products.

The Swedish PEFC and current FSC standard are practically harmonised to eliminate any possible differences in the implementation costs between the two certification systems.

4.8 Outputs of Certification in Sweden

All the interviewed certified organisations in Sweden indicated that certification has a positive impact on forest management and timber trade. The following main benefits were brought up:

1. Management system improves systematic development throughout the timber production chain. There is a strive for continuous improvement. Certification has brought some bureaucracy but it has been mostly beneficial and contributed to a more efficient management.
2. Systematic training of forest owners and contractors contributes to better forest management. High competence requirements for contractors and their involvement in the certification were highly appreciated.
3. Environmental protection has become an integral part of forest management:
   - Certification has contributed to favourable attitudes towards environmental protection, especially among private forest owners.
   - Protection of key biotopes and valuable natural areas through certification has importance for biodiversity protection.
4. Environmentally focused forest certification has had less impact on timber production methods. The criteria to improve timber production by various silvicultural measures have been few and less sophisticated than the environmental criteria.
5. Certification has had favourable impact on the communication with the public and interest groups.
   - Constructive dialogue with clients, public and environmental organisations were held. However, it was pointed out that certification has sometimes made the dialogue on sensitive issues more complicated.
   - Information of clients on the certification status (either FSC or PEFC) has been adequate evidence for responsible forest management in the export markets.
   - Double certification in several forest companies has enabled efficient timber transport and fibre allocation to different production plants and increased the share of certified wood fiber in production lines.

Some views indicated that the forest industry should give greater publicity to the certified timber products and thus create higher demand for certified timber (especially PEFC certified). In particular, sawmilling industry could benefit more from certified timber markets.

4.9 Effectiveness and Efficiency of Forest Certification in Sweden

4.9.1 Effectiveness

The framework for forest certification is quite unique in Sweden compared to Finland and Norway where the PEFC and FSC development processes and certification have been separated. In Sweden the first steps to harmonise the two standards were taken already in 2001 in the Stock Dove process that provided an independent and appreciated evaluation on the differences between the standards. Since then the standards and their implementation in practice has become more harmonised. Recent double certifications to FSC and PEFC systems further increase the harmonisation in performance requirements. There are not any essential differences between the requirements of the two standards apart from the slightly higher harvesting restrictions in FSC certification and stricter commitment by contractors in PEFC certification.

On the distribution of certified forests FSC certification has been dominating until 2004 when the larger companies received also a PEFC certificate. FSC certification has been very effective in promotion of environmental values in large-scale industrial forestry. Large companies can allocate the set-aside areas to the most valuable ones and take the special characteristics into account in the landscape ecological planning. The specified 5% share for set-aside areas and other quoted environmental values can be met at a regional level and need not to be addressed at a lower district level, which provides better possibilities for effective nature protection and efficient timber production. FSC-certification in private FMUs or groups of FMUs does not provide an option to allocate the set-aside areas on a larger landscape area.

In private non-industrial forestry, FSC certification has not extended to any larger forest areas. The private non-industrial forests have mostly been certified through the PEFC group certification arrangements. The Swedish PEFC system provides a framework for adaptable and effective group certification based on written contracts with participating forest owners and contractors. Forest owners' organisations and, their sawmilling industries' and independent private sawmills' group certifications are the only ones that have a significant number of small-scale non-industrial FMUs. Institutional and other large-scale forest owners have joined also other group certifications.

The share of certified family forests is far behind the target level but is increasing slowly. On the other hand, during the slower group certification process – compared with quick regional certification – each FMU is individually engaged, trained and inspired to understand, accept and like the system.

It has become evident that different incentives should be available to forest owners and price premiums for certified timber have turned out to be the most appreciated ones. Currently in Mellanskog area 15% of family forests are PEFC certified. As the agreements to participate in certification are usually made in connection with timber sales, the distribution of certified forests may be quite fragmented. One could suppose that in this case the ecological impacts of standard implementation remain low because the areas designated for environmental protection are small and fragmented. This view, however, was not supported by the interviewed parties, which considered the habitat-level protection to be the most effective way to protect e.g. threatened species.

Currently the certified area and its distribution determine more the effectiveness of forest certification in Gävleborg County than any difference in the FSC and PEFC standards. Taking into consideration the history of certification in the County and the high share of FSC certified industrial forests so far, the FSC certification has been more effective in the enhancement of forest management in the region.

Any expansion on the certified forest area should come from private non-industrial forests for which the PEFC certification has been the only feasible alternative. The strong commitment of the contractors to the process also increases the credibility of PEFC standard implementation. Considering the current PEFC certified area also in the forest industry and the future potential the PEFC certification will have a great significance in the further promotion of sustainable forest management in the region.

4.9.2 Efficiency

The cost-efficiency in forest certification is highest in large-scale industrial certifications. Smaller-scale and group certification arrangements decrease the efficiency. This trend is common to both PEFC and FSC schemes. The cost-efficiency in certification arrangements depend more on the size and type of certified organisation than on the certification schemes in Sweden. The value of the reduced harvesting possibilities covers the major part of the cost implications in forest certification. In Sweden the difference between the PEFC and FSC standards was not reported to be very different in this respect resulting that the cost-efficiency in both schemes is largely at a similar level. The overall environmental investment forestry sector makes should be recognised in the society.

Forest industry viewed that certification has been a good way to communicate on the environmental performance in the markets. Awareness on the certification status of forest products has satisfied the most needs of clients. Certification has also slightly decreased the criticism of ENGOs although it was not intended nor has it been a final solution for this issue.

Forest industry is not valuing the differences in the market benefits of PEFC and FSC certified products because the demand fully depends on the client. Their strategy is to be flexible in the production of certified products, which requires adequate supply of both PEFC and FSC certified fibre. Double certification is implemented to achieve this goal.

For non-industrial forest owners PEFC certification provides the most efficient alternative as a result of its group certification arrangements. Forest owners' organisations must invest continuously in the promotion of sustainable forest management and forest certification to increase awareness and interest among their members. In the long run this is essential for the reputation and image of the whole forestry sector.

Forest owners would like to see more market driven demand for certified products, which would increase also the demand and eventually prices for certified fibre and provide incentives for forest owners to participate in certification.

4.9.3 Conclusions

- The practical approach of harmonisation between the standards and double certifications have reduced the differences between the FSC and PEFC systems and directed the debate from the rigidity of either of the schemes to more practical questions, e.g. on the transparency of the forest information.
- Double certification in forest industry demonstrates that the audit and certification procedures recognised by the FSC and PEFC can be adaptable and cost efficient, require equal competence and can equally credible in both systems.
- Despite the standard harmonisation and double certifications, the PEFC and FSC processes have not come any closer for mutual recognition due to other reasons than their contribution to forest management.
- The Swedish PEFC system provides a range of options for group certifications. Yet the arrangements and efforts made by forest owners' organisations are decisive when the involvement of private forest owners is aimed at. If there are markets for both certified and uncertified timber, additional incentives would be needed for a higher share of participation.

5 ADGER-TELEMARK CASE STUDY IN NORWAY

5.1 Forest Management System in Norway

In Norway the forestry sector is under the Ministry of Agriculture and Food (Figure 5.1). At the regional level the Ministry is represented by a county governor who contributes to the implementation of national agriculture policies by information, distribution of state grants, and through locally adapted measures. The governor co-operates in several fields with other regional state offices and local government. Encouraging new business based on farming and forestry are important fields of co-operation. The governor's office acts as secretariat to the County Agricultural Board.

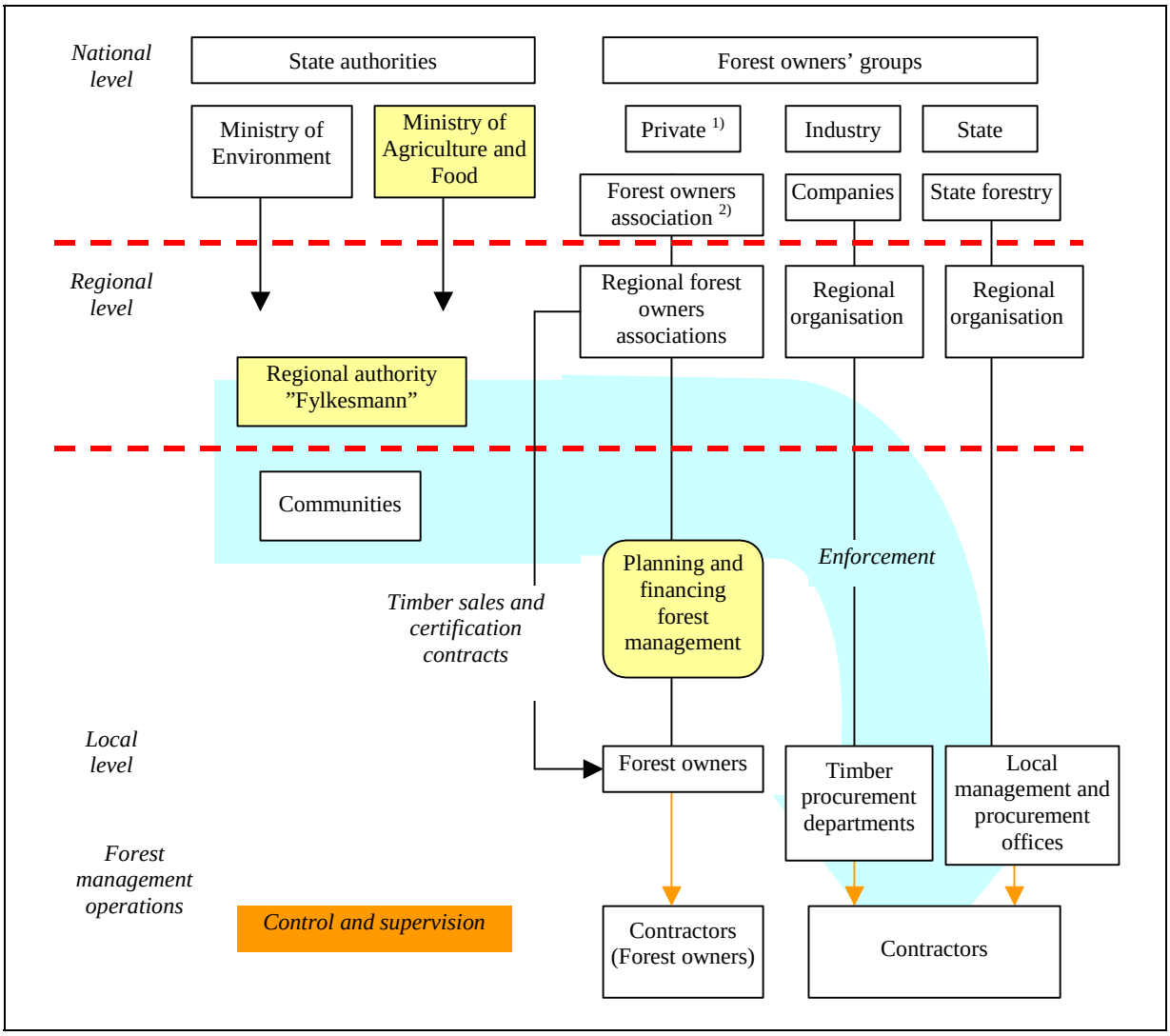
The Ministry of Environment is responsible for the overall nature and environmental protection. Unlike in Finland or Sweden, in Norway communities are responsible for law enforcement.

Norwegian Forest Owners' Association (Norges skogeierforbund, NSF) and its regional associations represent private non-industrial forest owners. The regional associations assist forest owners in long-term and operational-level planning, timber marketing and also organize harvesting operations on behalf of forest owners. The forestry operations are carried out by contractors in most cases under the supervision of a regional forest owners' association or industry (timber procurement departments).

Companies have largely sold out their forest property and in most cases only maintain timber procurement units at regional and local levels. The companies that still have own forests have their appropriate field organization.

State forests are managed for timber production but recreational values are emphasized especially in frequently visited areas.

Figure 5.1 Forest Management System in Norway



5.2 Normative Regulations in Norway

The Norwegian Forestry Act dates from the year 1965. Its main focus areas are long-term sustainable timber production and recreational values of forests. The latter aspects with some references to nature protection were included in the revision of the Forestry Act in 1976. The Forestry Act is general and requires that the forestry sector itself defines detailed procedures to implement statutory obligations. The Act includes however, a provision for regeneration of harvested forest areas and forest owners shall deposit a share of timber sale revenues to cover the regeneration costs (Box 5.1).

Currently the Forestry Act is under extensive revision and the new version is scheduled for 2005 and a new code regarding regeneration for 2005-2006. The revised Environmental Code is scheduled for 2006. An Act on Biodiversity is also under development and can have significant implications for forestry in the future

Normative regulations restrict harvesting in high altitude protection forest area. In other areas including unproductive forest land (growth $< 1\ m^3/a$) forest management for timber production is allowed.

Box 5.1 Main Legislation Guiding Forest Management in Norway in 2004

Forestry Act 1965, 1987 No 25
Cultural Heritage Act 1978 No 50, 2000 No 14
Nature Conservation Act 1995 No 59
Act relating to Outdoor Recreation 1957 No 16
Act on Water Resources* 2000 No 82
Planning and Building Act 1985 No 77, 2005
Wildlife Act 1981 No 38
Working Environment Act 1997/2001/2003 No 27

* Author's translation

In Norway communities enforce forestry legislation with the support of the regional county governor representing the Ministry of Agriculture and Food. Unlike in Finland and Sweden, a notification of planned harvesting activities is not required. Regional forest owners' associations, e.g., Adger-Telemark Skogseierföreningen (AT Skog) that normally buys close to 99% of the timber harvested, informs communities on the monthly basis on the purchases made. This keeps the communities updated on the location and the level of harvesting operations. Forest owners should also have either a forest management plan or in the absence of a plan make an environmental survey before and after harvesting operations. Compliance to this requirement is checked with random sampling by municipal authorities .

5.3 Certification Standards in Norway

In the 1990s the forestry sector launched several projects to meet the public demands for improved ecological and social performance in forest management. The first projects, "Richer Forest" in 1991 and "Biological Diversity in Forests" in 1993, emphasised awareness raising among the public and the forestry sector but set also requirements for forest management (Svedrup-Thygeson et al 2004). The "Living Forest" project was initiated by forest owners and forest industry in 1994 to respond to the increasing pressure for environmentally sound forest management. The Living Forest Standards for sustainable forest management were agreed by all participating stakeholders in 1998 (Arnesen et al 2004). The PEFC Council endorsed the Living Forest Standard in the year 2000. Currently the Living Forest Standard is due for a periodic revision. Comprehensive evaluations on the standard implementation and its impacts on in different aspects of the forestry sector have been made to provide background information for the revision work. The revised standard is scheduled for the end of 2005.

There is no national FSC standard in Norway. SGS Qualifor has issued one FSC group certificate based on an interim local standard. This standard is based on the FSC Principles

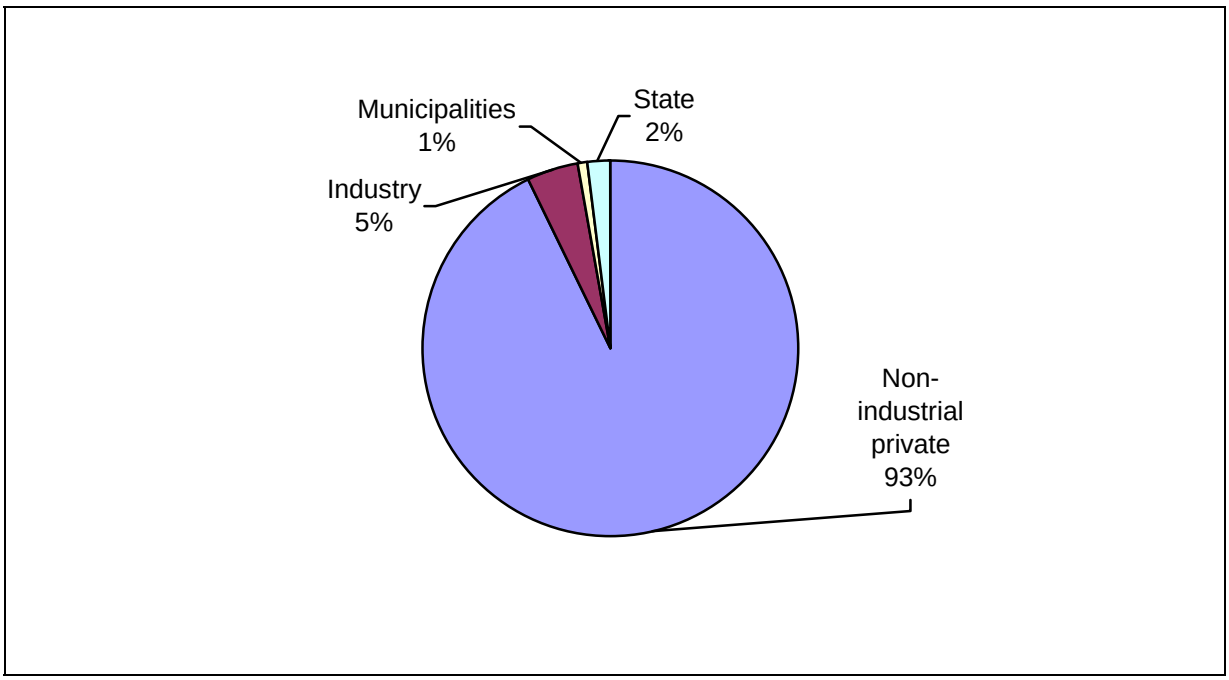
and Criteria but also includes elements of the Living Forest standard and the Swedish FSC standard.

5.4 Forestry and Forest Certification in Adger Telemark Region

Forests in Adger Telemark region are dominated by spruce and pine forests. Valuable broad-leaved forests grow on lower land. The total forest area in the Telemark, Aust-Adger and Vest-Adger counties is 1.5 million hectares. Close to 74% of the forests are productive (annual growth > 1 m^3) and 26% are classified as unproductive.

Nearly 93% of forest area (1.4 million ha) are owned by non-industrial private forest owners (Figure 5.2). The average holding size is about 76 ha. Forest industry owns 70 000 ha although most of the larger companies have sold their forests to private or institutional investors. Municipal and state forests cover 40 000 ha. Permanently protected nature reserves cover close to 14 000 ha (1%) of the total forest area.

Figure 5.2 Forest Ownership in Adger-Telemark Region



Annual harvesting from private forests is 0.9 million m^3 (Adger Telemark…2003). The most common harvesting method is through small clear cuts of two to three hectares. Recently more emphasis is given to explore possibilities for selective felling in spruce dominated forests. Risks of soil damages through harvesting are one of the major environmental concerns in the region.

5.4.1 Certification in the Adger Telemark Region

The Adger-Telemark Forest Owners Organisation (AT Skog) received the first certification according to ISO 14001 and the Living Forest Standard in 1998 and has maintained the certificate since then. AT Skog does not posses own forests but buys practically all timber produced by its members. AT Skog has decided to deliver only certified timber and several forest industry companies, e.g. Norske Skog AB, have made similar commitment in their environmental management systems. Most forest owners sign a commitment to forest certification when making the first sales contract with wood trading or processing organization (e.g. forest owners' organization).

Forest owners shall produce a forest management plan that takes into consideration environmental values or, if such a plan does not exist, they shall make an environmental survey prior to every harvesting operation.

In Norway municipal forests and partly also state forests belong to the forest owners' associations' group certifications. State forestry also cooperates with association SB Skog and company of Borregaard Skoger which have group certifications according to the Living Forest Standards.

There is one FSC group certification in Norway totalling to 5 100 ha. This certification in Sørlandet includes the forests of Telemark, Aust-Adger and Vest-Adger regions. The certified members provide timber solely for one client exporting FSC-certified products. The group has not had the intention to increasing the area considerably because they can currently supply the existing market demand for FSC-certified timber. The members have appointed a group manager who carries out annual internal audits and represents the group to the certification body and other parties. All the members in FSC group certification are larger institutional forest owners.

5.5 Comparison of Performance in Certified Forestry in Norway

5.5.1 Scope

The standard comparison is made between the normative rules and the certification standards as grouped under the components following the Pan European Criteria for SFM. The comparison establishes to which degree the Living Forest and FSC standard requirements exceed the normative rules. The standards evaluated are the current 1998 approved version of the Living Forest Standard and the Interim FSC standard for certified OvF Sørlandet against which the SGS Qualifor FSC auditing was made in 2001. A detailed comparison of the normative framework and the standards is presented in the Annex 3.

5.5.2 Standard Requirements and Legislation in Norway

5.5.2.1 Criterion1: Maintenance and Appropriate Enhancement of Forest Resources and Their Contribution to Global Carbon Cycles

(i) Normative Framework

The Forestry Act sets the minimum age when a forest stand may be regenerated. It also requires a prompt regeneration of harvested sites. Forest land may be converted to other uses but an authorization is required if conversion is made in protection forests or in young coniferous stands.

National forest inventories monitor the quantity and quality of forest resources through a six-year cycle covering the whole country.

(ii) Standard Requirements

- The Living Forest Standard requirements address maintenance of forest cover and prompt regeneration. The standard requirements are comparable to the provisions of the Forestry Act.
- The FSC standard also refers to the Forestry Act in defining the requirements for regeneration and conversion of forest land. The FSC standard provides general specifications for long-term production capacity and economic viability.

Box 5.2 Remarks on the LFS and FSC Requirements on Forest Resources

Regarding the maintenance of forest resources both the Living Forest and FSC standard are at the normative level which ensures the maintenance of forest resources in Norway. The FSC standard is more detailed in the provisions on the quality and management of forest stands.

5.5.2.2 Criterion 2: Maintenance of Forest Health

(i) Normative Framework

The Forestry Act sets provisions to prevent insect and fungal damages by appropriate sanitary fellings in high-risk areas.

(ii) Standard Requirements

- The Living Forest Standard does not set additional provisions for forest health.
- The FSC standard also relies on the normative level but specifies that forest management should aim at avoiding fungal, insect, wind and game damages. The game populations should be kept at a level that allows broadleaved regeneration to develop to tree-size.

Box 5.3 Remarks on the LFS and FSC Requirements on Forest Health

On forest health the FSC standard is more specific than the Living Forest Standard. Provisions of the two standards to prevent the damages and control game populations are in line with the commonly practiced forest management guidelines.

The performance requirement in the Living Forest Standard is at the normative level and in the FSC slightly above it

5.5.2.3 Criterion 3: Maintenance and Encouragement of Productive Functions of Forests (wood and non-wood)

(i) Normative Framework

The Forestry Act requires a sustainable timber production and sets provisions for regeneration. Forest owners shall pay a deposit to the Forest Trust to ensure financing of regeneration operations.

A felling notification is required only for activities in protection forests or other special areas.

Forest management plans are voluntary, but in special cases the County Land Board can require a plan or demand information of the required pre-assessment of environmental values in a forest holding. Government and forest owners' organisations give subventions for management plans that include an assessment of environmental values in the forest holding.

The Wildlife Act controls the hunting and game management and the Act on Outdoor Recreation ensures free access to forests to enjoy and collect non-wood forest products.

(ii) Standard Requirements

(a) Forest Management Plan

- In the Living Forest Standard and procedures for participation in group certification a forest management plan or an evaluation of biological values in forests (key biotopes, threatened species, etc.) is a precondition.
- FSC standard requires that all FMUs should have a forest management plan not later than five years after the certificate was issued. If a plan is not available, FMUs should carry out an environmental impact analysis before every harvesting operation.

(b) Wood and Non-wood Products

- The Living Forest Standard requires assurance of long-term wood production by using variable silvicultural methods that improve the quality of timber. The standard allows options for felling methods in different types of forests and sets requirements for site clearance and regeneration. However, the standard does not set provisions exceeding the normative regulations regarding harvesting levels but prohibits any measures that may have adverse impacts on the resource base.

- The Living Forest Standard does not set any specifications for the non-wood forest products, but it refers to recreational values of forests which are closely linked to the collection of berries, mushrooms, etc.
- The FSC standard has adopted most regulations of the most Living Forest Standard especially on timber production, and is thus partly identical.
- The FSC standard also addresses the non-wood forest products through the safeguarding of recreational values in forest management and free access to forest areas.

Box 5.4 Remarks on the LFS and FSC Requirements on Timber Production

The Living Forest and FSC standard requirements on timber production and use of non-wood products are practically identical. Both standards emphasise maintenance of the long-term production capacity. FSC requires active measures to ensure high quality seedling stands, the Living Forest Standard focuses on intermediate cuttings to increase the quality of produced timber.

Both standards exceed the level of normative regulations.

5.5.2.4 Criterion 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems

(i) Normative Framework

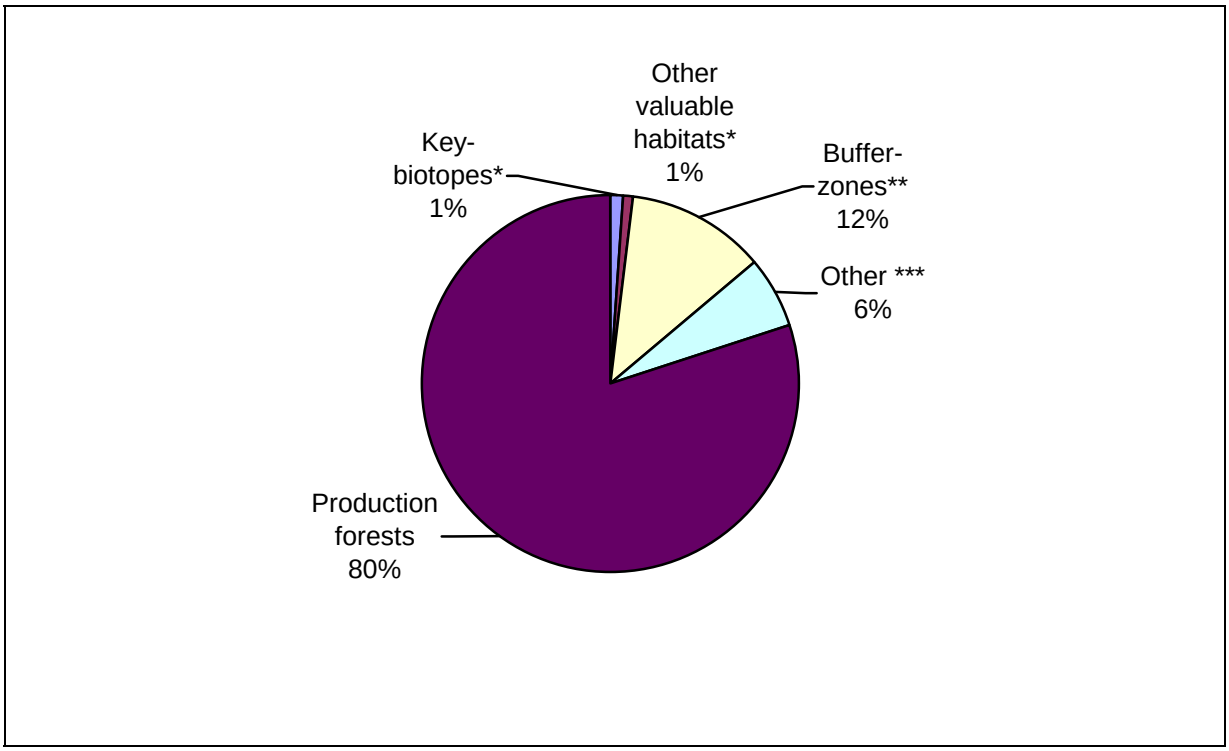
The Nature Conservation Act sets provisions for the establishment of nature reserves and listing of threatened species. The Wildlife Act also addresses species protection.

Forestry legislation has not specific provisions regarding biodiversity conservation but it requires that the forestry sector should define procedures to protect biological diversity in forests. The revised Forest Act will be issued in 2005 and will set more detailed provisions for biodiversity.

Skog Forsk (national forest research institute) has developed a method for surveying and evaluation of biologically valuable habitats in forests (MiS-method). Private sector, *i.e.* forest owners' organisations have organised the surveys at a regional level. To date a total of 376 000 ha has been surveyed. The register includes all areas with environmental values, which cover about 24% of the total forest land (productive and unproductive). The share of the most valuable sites vary from 0.6 to 6% between municipalities, the average share being about 2% of the total forest land. AT Skog estimated that production oriented forest management is not implemented on about 20% of total forest area (Figure 5.3) (Hobbelstad et. al. 2004).

The estimate for the share of buffer zones is based on the National Forest Inventory that considers a 20 m buffer zone around mires and swamp forests and water bodies. In practice the width of the zone varies according to the site conditions but field studies demonstrate that in general buffer zones have been adequate to prevent leaching (Sverdrup-Thygeson et al. 2004, Hobbelstad et al. 2004).

Figure 5.3 Production Forests and Set Aside Areas in Adger-Telemark Region



*Sources: * Adger-Telemark…2003*
*** Hobbelstad et al 2004*
**** Mires and swamp forests and other set aside areas*

(ii) Standard Requirements

(a) Rare Ecosystems -Ancient forests, protected forests, rehabilitation of degraded areas

- The Living Forest Standard requires that forest owners protect up to 1% of their forest area without any compensation. In forest holdings below 50 ha the protected habitats should cover a minimum of 0.5 ha. Normative regulations will require that all the habitats included in the netto register should be managed only for environmental purposes also in cases where their share might exceed 1% of the forest area in a forest holding.
- After a forest fire an area of 0.5 ha should be left for natural succession for the next 10 years.
- The Living Forest Standard also requires buffer zones around water bodies and mires where a multi-story forest structure should be maintained but does not set any minimum width for buffer zones.
- The amount of dead and decaying wood should be increased by leaving five to ten older retention trees per hectare after regeneration cutting. Wind-falls, which are older than five years should also be left in the forest. In practice the number of dead trees reaches up to 21.3 trees per hectare (Hobbelstad et al. 2004).
- The FSC standard does not allow any forest management in unproductive forests, important natural forests, key biotopes or aspen forests. At least 5% of the forestland should be preserved from any commercial forest management. This share may include also buffer zones for valuable habitats. Only the activities aiming at enhancing the biological value of the habitat are allowed on this area.

- The FSC standard demands ten retention trees per hectare. In addition, decaying wood should be produced by cutting high stumps or leaving windfalls and other trees in the forest. The target level is 5 m^3/ha.
- For mountain forests, which are often also protection forests, both standards and legislation set additional provisions.
- Both standards also prohibit clear-cutting and intensive management of bogs and wetland forests.
- Landscape-level ecological planning for forest holdings exceeding 1 000 ha is required in both standards.

Box 5.5 Remarks on the LFS and FSC Requirements on Set-aside Areas and Dead Wood

The requirements for set-aside areas in both standards exceed the current legislative level. The interim FSC standard require 5% share of set-aside areas whereas the Living Forest Standard does not set any thresholds for these areas but requires that biologically valuable habitats, buffer zones, valuable broad-leaved forests and wetland forests shall be preserved. In practice the set-aside areas reach up to 14 to 20% of forest land.

The requirements on the amounts of the decaying and dead wood are somewhat higher in the FSC standard and it requires active measure to create decaying wood. However, field studies indicate that in Living Forest certified forests the share of dead wood has increased to 10% of the standing volume.

On the provisions for mountain forests, management of bogs and wetland forests both standards are more or less equal. The standards also require landscape ecological planning on larger forest holdings, which is a requirement that exceeds the normative provisions set for planning.

(b) Threatened Species

- The Living Forest Standard sets a general requirement to safeguard rare species in forest management operations. Protection of areas of biological importance is the operative tool for species protection.
- In a forest management plan or an environmental analysis to be made prior to any forestry operations available information from environmental authorities on the threatened species should be compiled.
- Also in the FSC standard the species protection is taken care mainly through the habitat protection (5% share of set-aside areas) but the standard also requires that occurrences of threatened species should be taken into consideration in forest management planning and implementation.
- According to FSC, the forest owner is responsible to find information on possible occurrences of threatened species before harvesting operations.

Box 5.6 Remarks on the LFS and FSC Requirements on Threatened Species

The FSC and Living Forest Standards exceed the normative requirements in the measures to protect rare and threatened species. The approach to protect rare and threatened species through habitat protection is alike in both standards. The standards require a survey of possible occurrences of threatened species before harvesting activities if they are not listed in a forest management plan.

(c) Diversity in Production Forests - genetic and species diversity, regeneration

- The Living Forest Standard emphasises the use of native tree species and implementation of natural regeneration when ever possible. The target share of broadleaved trees in a FMU should be 10%. The use of gene-modified organisms (GMO) is not allowed.
- The FSC standard is identical to the Living Forest Standard in the requirements to use native tree species, and to prohibit GMOs. Neither standard prohibits the use of exotic species but emphasise the use of native species.
- The FSC standard sets additional requirements for the share of broadleaved tree stands requiring a 5 to 20% share of stands dominated by broadleaved trees.
- FSC also restricts the cultivation of spruce outside its natural distribution area and requires a minimum share of old-growth forests on large forest holdings (> 1 000 ha).

Box 5.7 Remarks on the LFS and FSC Requirements on Species Selection and Regeneration

The Living Forest and FSC standards have a similar approach to protect genetic and species diversity in forests. Both standards require favouring of native species and natural regeneration. They also restrict the use of clear-cutting on selected forest types These requirements are more demanding than the normative rules for regeneration where forest planting and use of exotic species is fully allowed.

The FSC standard requires additionally a higher share of broadleaved -trees dominated stands, old-growth forests and restricts spruce cultivation in the nemoral zone.

5.5.2.5 Criterion 5: Maintenance and Appropriate Enhancement of Protective Functions in Forest Management (notably soil and water)

(i) Normative Framework

The Forestry Act makes provisions for defining sensitive forest areas as protection forests and any forestry operation in these areas requires permission from authorities.

Water legislation provides protection of water bodies from siltation and pollution but it does not set specific requirements for forest management. Due to the highly variable topography in Norway soil and water protection is of high concern in forest management.

(ii) Standard Requirements

- The Living Forest Standard restricts summer time harvesting on sensitive soils and soil damages in timber transport. It requires that any damage is repaired without delay.
- The Standard requires a buffer zone with multi-level canopy structure along water bodies and wetland forests. The average width of a zone is about 20 meters.
- The FSC standard requires special caution and restricts the use of machinery when operating in the vicinity of watercourses. The buffer zones should be adequate to the site conditions (the average width is about 20 m).
- The Living Forest and FSC Standards set identical restrictions for soil scarification, fertilization, the use of herbicides and waste management.

Box 5.8 Remarks on the LFS and FSC Requirements on Soil and Water Protection

Both standards consider the risk of soil erosion and water protection in forest management and are more specific than normative regulations. There is very little practical difference between the two standards.

5.5.2.6 Criterion 6: Maintenance of Socio-Economic and Cultural Functions and Conditions

(i) Normative Framework

Recreational values are of high priority in Norway and they have to be considered in forest management as defined in the Act on Outdoor Recreation issued already in 1957. Additional restrictions on forest use are issued for areas, which are important for recreational use. The Planning and Building Act and municipal planning restrict and guide forest management on highly populated or visited areas.

The Wildlife Act sets the basic provisions for hunting that is further regulated by administrative rules.

Norwegian labour legislation is strict and meets the general requirements of the core ILO Conventions. The Working Environment Act requires that all companies shall develop systematic procedures to ensure health and appropriate environmental and safety procedures in a workplace.

The current Forestry Act does not set any provisions for the publicity of forest information except for the municipalities, which should have forest management plans and communicate them to the public. The new revised Forestry Act will require transparency for the environmental data of forest holdings.

Cultural heritage sites and ancient remains are protected by the Cultural Heritage Act that requires protection of a long list of sites and objects possibly encountered when working in the terrain.

(ii) Standard Requirements

(a) Economic significance and infrastructure

- The Living Forest Standard does not set any objectives for the economic significance of forestry sector.
- On forestry infrastructure the Living Forest Standard prohibits damages to tracks used for outdoor life or roads of cultural and historical value.
- The FSC standard gives general provisions that the certificate holder should contribute to the long-term social and economic well-being in the local communities by providing employment, competitive and profitable forestry.

Box 5.9 Remarks on the LFS and FSC Requirements on Economic Contribution of Forestry

The Living Forest Standard focuses on forest management and does not set any requirements for how forest managers should contribute to the economic development at local or regional level.

FSC sets general requirements for the responsibilities of forest manager to contribute in the social and economic well-being and is in this aspect more demanding than the Living Forest Standard.

The FSC standard exceeds the normative level and the Living Forest standard is at the normative level.

(b) Recreation and the rights of indigenous people

- The Living Forest and FSC standards require that the quality of outdoor activities, especially along tracks and paths, should not be deteriorated due to forest management.
- FSC further emphasises that multiple use should be the overall principle in forest management and that hunting should be sustainable and safeguard biological diversity.

Box 5.10 Remarks on the LFS and FSC Requirements on Consideration of Recreational Values and the Rights of Indigenous People

The Living Forest and FSC standards equally emphasise the recreational values of forests. Both standards are more specific than legislation but do not set additional requirements.

(c) Employment

- The Living Forest Standard requires that workers should possess adequate competence in their tasks and work safety and they should receive guidance for new tasks. Organisations should monitor and document compliance to the safety measures.
- In addition to the above requirement (that is also included in the FSC standard), the Living Forest Standard emphasises continuous working contracts and physical, mental and social quality of working environment.
- The FSC standard states that any new unproven method or material that may have remarkable negative impacts on human or environment should not be implemented or used before it is approved by FSC.

Box 5.11 Remarks on the LFS and FSC Requirements on Employment in Forestry

The Living Forest Standard is largely at the normative level on the issues relating to employment and working conditions.

The FSC standard is slightly broader taking into account also the continuity of working contracts, which is partly addressed also in legislation.

The requirement that FSC should validate the impacts of potentially harmful new methods or materials and approve or disapprove their use is unclear as it is not defined to which body such a request should be addressed and how the need for this process is evaluated. Feasibility of such a system can be questioned.

(d) Public awareness and participation, cultural values

- The Living Forest Standard has limited provisions for public awareness raising or publicity of forest management operations. The Standard requires that landscape ecological plans should be made for large forest holdings (> 1 000 ha) but in Norway the process does not necessarily include a wider participatory process. However, information exchange between experts of different fields is an integral part of the planning.
- The Living Forest Standard requires the preservation of cultural landscapes and heritage sites, that should also be included in the forest management plan
- The FSC standard sets identical provisions for landscape ecological planning and, in addition, it requires a greater contribution to the local well-being.
- The FSC standard is more specific in defining forest management activities allowed on cultural landscape areas.

Box 5.12 Remarks on the LFS and FSC Requirements on Consideration of Cultural Values and Stakeholder Participation

Regarding the publicity of forestry plans neither the Living Forest nor the FSC standard sets significant additional requirements compared to the current legislation. However, the FSC standard is slightly more demanding in this respect though.

Publicity of forest information especially that on valuable habitats has been under a debate in Norway during the MiS survey of biologically valuable habitats. The preliminary list of habitats (brutto list) has not yet been published and ENGOs claim that lack of transparency increases the risk that valuable sites are left out from the final list (netto list).

5.5.3 Summary of the Evaluation of the Living Forest and FSC Standards in Norway

In Norway the forest legislation dates from the 1960s although it has been amended in several occasions. However, it does not fully take into consideration the current need for environmental and biodiversity protection. Therefore, the forestry sector together with ENGOs and other stakeholders, had to take the responsibility to develop systems that complement legislation and ensure appropriate consideration of environmental, social and productive aspects in forest management. The Living Forest Project was initiated for that purpose. Both the Living Forest Standard and the Interim FSC standard exceed current normative regulations, especially in biodiversity conservation.

FSC is slightly more specific in its requirements whereas Living Forest Standard describes the requirements on a more general level. In practice the provisions may not have significant differences, e.g. in the promotion of broadleaved trees in forests or preservation of old-growth forests. Current trends in forest management have significantly increased the share of broadleaved forests. On water protection the two standards are practically at the same performance level.

The major difference between the Living Forest and the FSC standards concern the protection of biologically valuable habitats. Living Forest Standard has a qualitative approach to the protection of valuable habitats and it does not set any specific thresholds for set-aside areas. The Living Forest Standard recognizes that valuable habitats be identified in the national survey and allows management on these areas if it does not harm the biological values.

Currently, with the survey still going on, forest owners in many parts of the country may negotiate on the protection of specific sites and suggest alternative sites for the proposed ones. In future many of the most valuable sites should be maintained by a normative rule. FSC standard lists, on the other hand, valuable habitats and sets thresholds for their protection. In the management of these habitats FSC gives more responsibility to forest owners in identifying valuable habitats and allows forestry operations only if their purpose is to maintain or improve the environmental value of the habitat. The share of set-aside areas in forests exceed currently by far the 5% threshold required in the FSC standard.

5.5.4 Changes in Forest Management after the Implementation of Living Forest Standard

The Living Forest project has raised the awareness on environmental and social issues in forestry. Simultaneously, knowledge on biodiversity and its conservation methods has increased through government-financed surveys and research, which have provided a good basis for biodiversity protection in practical forest management.

The Norwegian Institute of Land Inventory (NIJOS) analysed the changes related to forestry in Norway after the implementation of the Living Forest Standard (Hobbelstadt et al. 2004). The study was based on information collected from the periodic National Forest Inventories. The results indicated the following positive changes in forest structure:

- The share of old forests has significantly increased although the Living Forest Standard does not set any provisions for the share of old forests.
- Also the share of dead wood has increased up to 10% of the standing volume. The required five retention trees have been left in 90% of the relevant cases and the number of large retention trees (more than 20 cm in diameter at breast height) is on average 21.3 trees per hectare, which exceed both the FSC and Living Forest Standard requirements of ten trees.
- About 12.2% of productive forest land is classified as buffer zone to mires or water bodies and in most regeneration cuttings (75-85% of the cases respectively) buffer zones have been taken into consideration as appropriate.

NORSKOG (Norsk skogsbruksförening) and Norwegian Environmental Research Institute (NINA) (Svedrup-Thygeson et al 2004) studied the differences in forest management on 60 regeneration sites including areas harvested before and partly after the implementation of Living Forest Standard (the study did not include the criteria on the Areas of Biological Importance). The results indicated significant improvements towards sustainable forest management although the study did not yield as positive results as presented in the NIJOS study:

- There is a remarkable improvement in leaving of functional buffer zones around mires and water bodies and their width is better adapted to the site conditions.
- The trend on respecting recreational, cultural values has been positive since the implementation of the Living Forest Standard.
- Improvements are however needed to further avoid soil damages caused by machinery in mires and wetland forests. Gap harvesting on these habitats should be increased instead of clear-cutting.

Most of the positive changes may have been induced by the Living Forest process and standard that is extensively implemented in private and industrial forestry. The area of FSC certified forests is marginal and does not show any influence on the forest structure at a national level.

5.6 Audit Results in Telemark Region

The AT Skog certification is made against ISO 14001 environmental management system standard and the Living Forest standard that sets the environmental performance targets of forest management. The external audit covers also the ISO 9001 quality management system standards. Thus, the audit focuses on management system elements and, in addition, any non-conformity to the Living Forest performance requirement is recorded and need to be corrected.

In the 2004 audits Det Norske Veritas AB issued five minor non-conformities (NC) and twelve observations that did not require corrective actions (DNV 2004). Only one minor non-conformity addressed environmental performance. The distribution of the non-conformities is presented in Table 5.1. Internal revisions by the AT Skog in 2004 prior to the external audit included 21 non-conformities and observations relating the ISO 14001, ISO 9001 and Living Forest standards (only the NCs on Living Forest Standard focused on aspects of forest management). The decreasing trend in NCs in external audit indicated that AT Skog has improved its conformity to the ISO 14001 and Living Forest Standards (DNV 2004).

Table 5.1 Distribution of Non-conformities in ISO 14001/9001 and FSC Certification

Organisation / **Standard**	**AT Skog ISO 14001/9001/ LFS**		**Sørlandet Interim FSC**	
Fields of remarks	**Minor NC**	**Observations [1)]**	**Minor NC [4)]**	**NC [5)]**
Management system				
Control of suppliers	1	1	0	0
Document control	0	3	0	0
Capacity building	0	1	0	0
Communication to public	0	1	2	0
ISO14001[2)]	1	1	0	NA
ISO 9001[2)]	2	4	0	NA
Performance criteria				
Soil damage (bogs)	1	0	0	0
Methods for LEP [3)]	0	1	0	0
Chemical use (control, policy, documentation)	0	0	2	0
Total number	**5**	**12**	**4**	**0**

1) Observations are not classified as non-conformities (NC) and do not require corrective actions
2) Non conformities exclusively linked with ISO management system standards and not with the Living Forest Standard (LFS)
3) Landscape ecological planning
4) Certification audit in 2001
5) Surveillance audits in 2002 and 2003

The national survey (Sverdrup-Thygeson et al. 2004) on the issued non-conformities in Living Forest certification demonstrated that non-conformities have about equal frequency for management system and performance based Living Forest requirements. At least 10-20 serious NCs have been recorded annually in the documentation assessed. External audits indicated that 30% of the non-conformities were linked to ISO 14001 standard, 49% to other system elements, and 21% to the Living Forest Standard. In the latter field the most NCs were related to aspects of the areas of 'old, coarse trees, dead wood', 'mire and swamp forests', and 'water protection'. The number of NCs per audit has decreased and there is a lower frequency of NCs on the conformity to the Living Forest Standard.

In the FSC certification there has not been any non-conformity in the external audits since the initial scoping audit. There the applicant did not have a policy to decrease the use of chemicals and their use had not been documented. Information to the public on the environmental management was not either adequate. These issues were corrected and no additional NCs or comments have been raised in the main audit report by the certification body, SGS Qualifor.

The number of non-conformities in external audits is low and demonstrates that the standards have been well implemented.

5.7 Certification Costs in Adger-Telemark Region

5.7.1 ISO 14001/ Living Forest Certification

As explained in the Chapter 2.3 certification costs can be divided into (i) **direct costs** due to external and internal audits; (ii) **organisational costs** including, e.g. training and information costs; and (iii) **loss of stumpage revenues** due to various restrictions on forest management and harvesting.

The annual direct costs of internal and external auditing for AT Skog are about EUR 133 500, which cover 5.2% of the total certification costs. External audit costs account for a marginal share, only 0.43% of the total inputs in forest certification (Table 5.2). Systematic internal field audits in members' forests require a considerable work input by forestry staff. In 2003 the AT Skog made 97 random checks in forest harvesting and over 60 internal revisions and controls in its own organization (Adger-Telemark…2003). The value of this annual input is estimated at 4.8% of all certification costs.

AT Skog and forest owners are also responsible for the annual inputs in training, information and other awareness raising activities. The Living Forest Project designed an extensive project funded information and training program among forest owners and entrepreneurs in the late 1990s (Arnesen et al. 2004). However, the need for training is continuous. Currently the costs of information and training cover one third of the certification costs.

AT Skog estimated that the implementation of the Living Forest Standard decreases the annually harvested volume by 5% through the timber left unharvested on buffer zones and biologically valuable habitats. The monetary value of that timber is roughly about EUR 1.6 million which represents about 62% of the total costs due to certification.

Table 5.2 Costs of ISO 14001/Living Forest Certification of AT Skog

	EUR/ha*	EUR/a	%
Direct costs			
External auditing	0.01	11 000	0.43
Internal auditing	0.12	122 500	4.79
	0.13	133 500	5.22
Indirect costs			
Organisational costs	0.81	835 000	32.66
Loss of stumpage revenues	1.54	1 588 000	62.12
	2.35	2 423 000	94.78
Total	**2.49**	**2 556 500**	**100.0**

Source: Adger-Telemark Forest Owners' Association
* Productive forest land of 1.03 million hectares

The total annual costs of the group certification amounts to EUR 2.6 million which represents about EUR 2.50 per ha of certified productive forest land. In Norway forest harvesting is allowed also on the non-productive forest land but their economic significance is marginal.

A national assessment of the Living Forest Standard implementation (Sverdrup-Thygeson et al. 2004) concluded that increased costs due to implementation of the Living Forest Standard would be EUR 0.10-1.00 per harvested cubic meter in forestry operations and EUR 0.20-4.30 per cubic meter due to loss of revenue because of reduced harvesting.

5.7.2 FSC

Reliable information on forest certification costs in the FSC group certification was not available. The costs presented in Table 5.3 are estimates based on general information on auditing and monitoring costs. The assumptions for the cost estimates are the following:

(1) Annual external audits take two working days EUR 700 each
(2) Group manager's internal audit takes annually five days EUR 300 each
(3) Annual fees for training and information would be about EUR 1 000
(4) The estimated loss of revenue is 4%.

Table 5.3 Estimates for the Certification Costs of FSC Group Certification in Norway

	EUR/ha*	EUR/a	%
Direct costs			
External auditing	0.38	1 400	14.2
Internal auditing	0.41	1 500	15.2
	0.78	2 900	29.4
Indirect costs			
Organisational costs	0.27	1 000	10.2
Loss of stumpage revenues	1.61	5 940	60.4
	1.88	6 940	70.6
Total	**2.66**	**9 840**	**100.0**

* Certified area 3 700 ha of productive forest land

In the certification of small units the share of direct certification costs increase considerably, although internal and external auditing would be carried out efficiently in both cases. On the other hand indirect costs on training and information remain low when the number of participants is low enough (e.g. below 10 to 20) to allow direct regular communication.

Loss of stumpage revenues for each forest owner is likely to be slightly higher in FSC certification. In areas where buffer zones and valuable habitats registered in the MiS register reach the 5% threshold for set-aside areas, the difference is not remarkable but increases if the share of valuable habitats is higher.

5.7.3 Price Premiums

Forest industry companies paid price premiums for certified timber when the forest certification was launched in Norway and forest owners were encouraged to participate in group certifications. The premium was about EUR 0.85 per cubic meter. Most companies have now withdrawn the price premiums and have restricted the trading of non-certified wood. Companies prefer to use a negative price incentive and pay up to EUR 1.70 less per cubic meter for forest owners that have lost their certification status. Companies may also implement other incentives such as compensation for set-aside areas or environmental management planning.

Currently there is no price premium for the certified wood, which forest owners consider to be a significant disadvantage because certification status is required in any case. However, price premiums were an important tool to raise the forest owners' interest to participate in certification and to make the environmental investments the Living Forests Standard requires.

5.8 Outputs of Forest Certification in Norway

5.8.1 Living Forest Certification

The Living Forest Project and Standard for sustainable forest management have been very beneficial for the Norwegian forestry sector. The three-year project produced in a consensus on a voluntary Living Forest standard for SFM which was a unique and very important example of a collaborative process between forest owners, environmental NGOs and large-scale industry with support from government ministries and consumer organisations (Arnesen et al. 2004). Later disagreements arose related to the integration of the Living Forest standard with optional certification arrangements, transparency of environmental information as well as the concept and management of natural forests. However, the well-conducted development process reflects to the positive outcomes of forest certification in Norway.

Overall certification has had an essential positive impact in forest management in Norway. Without the Living Forest Project and the developed standards or other certification options, the Norwegian forestry would presently have difficulties to meet market needs for assurance on environmental protection and biodiversity conservation. The transparent national process was supported by national stakeholder groups and gained international recognition.

- The Living Forest Standard development was a commonly approved stakeholder process but the standard implementation in certification is perceived to lack transparency and confidence by ENGOs, which have led to internal criticism of the certification process.
- Integration of the Living Forest scheme to the environmental management systems increases the systematic and holistic implementation of the scheme throughout all activities in the forest owners' organisations. The system requires explicit environmental objectives and good documentation; both elements contribute to the systematic implementation of Living Forest standard.
- Both Living Forest and FSC standards represent higher levels of performance requirements than the normative ones. FSC standard sets higher restrictions on the management of set-aside areas.
- Living Forest standard emphasises environmental aspects although recreational and work-safety is addressed merely at the level of normative regulations. FSC is slightly broader in aspects concerning labour and partly exceeds the normative regulations in these aspects.
- In the auditing process non-conformities have about equal frequency for management system and performance based requirements. The total number of non-conformities and the share of performance based non-conformities have decreased during the certification period. In recent years, in whole Norway about 80% of the non-conformities are linked to ISO 14001 or other management system elements and 20% to the performance requirements of the Living Forest standard (Sverdrup-Thygeson et al. 2004).
- Based on the currently certified forest management units and partly based on rough cost estimates, it seems that the FSC and Living Forest certifications are comparable in cost efficiency. This was achieved through group certification arrangements in both schemes, extensive internal audits, introduction of training elements and information dissemination. The cost ration depends greatly on the size of area certified and the comparison reflects only the situation in the current certifications.
- Market benefits have been evident but they have mainly been qualitative ensuring better access to the market and better image of the Norwegian forest products. Forest owners have had quite limited access to the economic market benefits brought by forest certification. At present, owners without certification would probably be obliged to accept lower sales prices of timber than they are currently receiving for certified timber.

The Living Forest standard concentrates on environmental issues and has made these an integral part of the forest management in conditions where this was not fully considered by the normative framework. Surveys and studies on the practical impacts of the Living Forest Standards demonstrate that significant positive changes in forest management have taken place (Hobbelstad et al. 2004). The Living Forest process also mobilised significant resources on awareness raising and training, which is a precondition for successful group certification among private forest owners.

Forest certification and its linking with ISO 14001 management system certification has provided systematic internal control procedures that contribute to the environmental and social quality of forest management, together with a contract-based commitment of forest owners to certification. The process has also standardised the environmental management in forests.

The Living Forest process and standard implementation has led to extensive biological surveys in the country, e.g. survey of biologically valuable habitats (MiS) because additional

information was needed to specify the concept of biologically valuable habitats. However, environmental NGOs criticise that the certification process and information on valuable habitats is not transparent and therefore cannot have the full support of the environmental sector.

5.8.2 FSC Certification

The Norwegian FSC certification was arranged to meet the raw-material needs of a specific client. Certification was a precondition to have an access to this market. In the presence of an efficient Living Forest based group certification under forest owners' organizations, the FSC certification has not gained any ground in the country although Norwegian timber processing companies are international and also process FSC-certified timber.

The environmental and social contribution of FSC certification would be significant and comparable with the Living Forest certification. Market benefits have not been adequate to provide incentives for forest owners to apply for FSC certification on a large scale.

5.8.3 Market Outputs

The forest and chain of custody certifications have provided market benefits for Norwegian forest products. Certification has provided an adequate message to the markets providing reliable information on their environmental and social quality of Norwegian forestry. Product label is an important element in market communication although some companies have adopted the policy of not labelling their products. In any case, all companies use certification in their market communication, either targeted at the general public level or exclusively when communicating with individual clients.

The international and national market debate has concentrated on the competitiveness of the Norwegian timber products and not on the ranking of the environmental performance compared to other producing countries. Industry and forest owners see that certification has decreased the unspecified ENGO criticism towards Norwegian forestry. Good management system-based certifications also provide prompt procedures to correct any activities not conforming to the Living Forest Standards.

The ISO 14001/Living Forest group certification process is expensive and bureaucratic partly due to the required management system elements in large group certifications with quite heterogeneous members. Absence of price premiums increases the economic burden of forest certification on forest owners and their organizations.

5.9 Effectiveness and Efficiency of Forest Certification in Norway

5.9.1 Effectiveness

In Norway the extent of certified forest area largely depends on the certified area of private non-industrial forests. The Living Forest group certification is well adapted to the national organisational structure and timber trading procedures. In areas dominated by private ownership, and with strong forest owners' organizations trading timber from private forests, a

close to 100% certification ratio has been reached, as is the case in the Adger-Telemark Region.

The Living Forest and FSC standards exceed the legislative requirements that are partly outdated and under revision. With this background both standards have contributed to SFM, especially the environmental quality of forest management.

After the revision of the Forestry Act and environmental legislation, and the finalization of the registration of valuable habitats (MiS), the difference between regulations and voluntary standards will be less significant, but still important e.g., in the protection of water bodies and mires.

Forest certification against the Living Forest Standard has been a very effective tool to improve forest management in Norway. Due to the marginal certified area the effectiveness of FSC certification is low.

5.9.2 Efficiency

The efficiency of Living Forest and FSC certifications is evaluated through the costs and benefits. Although very different in scale, the total costs per certified area in Living Forest and FSC certifications are at a comparable level (EUR 2.5 and EUR 2.7 per hectare respectively). The cost structure and unit costs vary very much according to the number of members in group certification and certified forest area, and therefore reliable estimates on the overall cost efficiency of either of the schemes cannot be made. Both schemes are equally cost-efficient in their pilot areas. However, FSC certification was made in an area covering large holdings while the Living Forest certified area was owned by small-scale private owners. The Living Forest certification appears to have been more efficient than the FSC certification in Norway, because it provides a cost-efficient method for large-scale certification of private forests.

The benefits of forest certification to forest owners are mostly qualitative in the form of improved forest and environmental management and somewhat better access to markets. The previous price premiums and possible other compensations paid by individual forest companies partly compensated the environmental investments in forest management. Living Forest certified timber has a better access to Norwegian markets at the moment as it is processed by all forest industry companies. Some international companies operating in Norway may process additionally FSC-certified timber. However, their focus is on the Living Forest-certified timber due to the marginal supply of FSC fibre.

Large supply of certified timber has enabled forest industry to develop economic incentives to encourage forest owners to certification. Forest industry wants to withdraw from direct price-premiums as soon as adequate supply of certified fibre was achieved. The willingness to provide other types of incentives is greater.

Management system-linked forest certification has improved the management and quality of operations especially in private forestry. It has also contributed to the market image of the Norwegian wood products and forestry sector. Direct financial benefits have not fully materialized and they do not cover the direct and indirect costs of certification.

6 CONCLUSION

6.1 General

Forest certification has improved sustainable forest management in the three Nordic countries. Greatest contributions have been achieved in environmental protection, which has become an integral part of forest management.

Any evaluation comparing the national PEFC and FSC based standards reflects the situation at a given time period. The conclusions made should be re-evaluated when further scientific knowledge is available on the biological, social and economic impacts of the standards.

PEFC and FSC forest certification schemes are under continuous development process. By definition standards are periodically revised and implementation arrangements are adjusted based on accumulating experience in standards and procedures. The Stock Dove process in Sweden is an example of a systematic approach to develop PEFC and FSC-based standards towards harmonisation that reflects a common understanding of SFM in the country.

6.2 Performance Requirements

6.2.1 Biodiversity Protection

In biodiversity conservation the major differences between the PEFC and FSC-based standards are due to the different requirements regarding set-aside areas. FSC requires a categorical 5% set-aside area whereas the approach in the PEFC standards is to focus on the defined valuable habitats when present in forests. Views on the effectiveness to reach benefits in biodiversity protection with categorical FMU level threshold values for set-aside areas are contradictory. Instead to protecting small (1.5 to 3) ha patches covering the 5% on every FMU, biodiversity conservation should be viewed from a landscape-level where habitat and species distributions and existing protection areas are taken into consideration when implementing the most effective protection measures for threatened species in the region. In large-scale industrial forestry set-aside areas can be located to provide high protection values, but in small-scale private forestry it is not possible. Effective measures would demand tailored inputs from private FMUs and compensations for forest owners should be planned accordingly. Protection of biodiversity is a national strategy in all the three countries, and there should be willingness and means to share this responsibility in the society.

6.2.2 Social Sustainability

On social sustainability the main concern in the Nordic countries is to maintain the forestry and forest industry related employment opportunities, which are crucial for the socio-economic development on rural communities. This concern is related to the national economy and cannot be fully addressed in the voluntary FMU level forest certification standards. However, several FSC and PEFC standards set provisions to promote capacity building and employment at a local or regional level.

Among the social aspects the voluntary standards focus on the accessibility to recreation and non-wood forest products (berries, mushrooms, etc.). Common law on free access to forests

recognised in all the three countries has paved the path for recreational use of forests and for the collection of non-wood products. Neither the PEFC nor FSC-based standards add to these traditional rights.

PEFC and FSC has different approaches to address this issue that concerns the relation between ownership rights and rights for traditional use of forests. PEFC relies on the democratic procedures where the society at large defines the rights and duties of different forest users and implements them through normative regulations. The PEFC baseline is that customary rights must be taken into consideration in forest management but the detailed content is to be defined in a democratic process.

FSC on the other hand describes in detail the rights and duties of different forest users regardless the level of other commitments made in the society. In this case the standard setting-working group alone specifies the rights and duties. If the working group cannot reach an agreement, which was the case in the FSC standard setting in Sweden, the disagreeing party most often resign from the process and the remaining stakeholders make the decisions on their behalf.

6.2.3 Economic Sustainability

- Economically sustainable forestry is the baseline both in PEFC and FSC standards. They set provisions for economic viability of forest management to produce high quality forest products (wood and non-wood). Often these requirements are expressed in a very general level compared to the environmental criteria and are paid less attention to in comparisons between the schemes.
- All standards focus on sustainable long-term timber yield and importance of forest management planning.
- They also set requirements for prompt regeneration of harvested sites but other explicit requirements on silvicultural measures to promote high quality timber production are quite few. The emphasis on economically and socially sustainable forest management is likely to increase in forest certification audits in future.
- Requirements for a high share of set-aside areas increase significantly the short and long term losses in stumpage revenues, which sets a more restricted framework to reach the economic sustainability in forest management.
- Forest certification has required a significant environmental investment from forest owners. The estimated values of loss in revenues due to harvesting restrictions are significant but may be, however, overestimated compared to the established practice where forest owners leave and have always left set-aside areas regardless of any external requirements. The required environmental investments tend to be higher in the FSC standards, although the practical implementations of PEFC-based standards have led to similar levels of set-aside areas.
- Certification has not brought significant economic benefits to forest owners, but it has contributed to the better environmental image of timber and wood products in the international markets, which in a long term may enhance the market access for Nordic timber and wood products. From the economic point of view forest certification has also been forest owner's market investment.

6.3 Effectiveness of Forest Certification

Effectiveness of forest certification greatly depends on the extent of certified forest area. When the standards are implemented over large areas especially the biological criteria have positive impacts on ecosystems. There are some differences in the levels of performance requirements between the PEFC and FSC based standards, but their significance is minor compared to the impacts of the total certified area. However, these differences in performance requirements have become key issues for stakeholders when evaluating the impacts of different forest certification systems.

PEFC based forest certification schemes are more effective in non-industrial private forestry, whereas FSC has effectively promoted sustainable forest management only in large-scale industrial forestry.

6.4 Efficiency of Forest Certification

Efficiency is determined through the benefits and costs of forest certification. Certification has been an important catalyst to (i) promote management in forestry organisations, (ii) integrate environmental and social aspects into everyday forest management, (iii) improve market communication, and (iv) promote the public image of forestry. In most cases certification has provided the adequate evidence on the sustainable origin of timber in the international markets. However, quantitative information on the market value of forest certification is not available.

6.4.1 Certification Costs

Only few certified organisations had recorded the direct and indirect costs related to forest certification. Therefore the cost comparisons are based on estimates in individual cases that the results cannot be generalised. Especially the examples in FSC certification are largely based on rough estimates drawn from studies and general information on audit costs. The given estimates provide only examples of certification costs but do not give a basis for comparison of cost-efficiency between the schemes or countries. The following general observations on cost analysis can be made:

- Direct costs of external and internal auditing represent a marginal share of the total costs. Group certification arrangements have kept these costs reasonable to the small-scale non-industrial forest owners.
- Direct costs and indirect costs due to training and information dissemination are more fixed by nature and therefore unit costs decrease dramatically as the certified area increases.

When the value of environmental investment in reduced harvesting potential is taken into consideration (representing 50-99% of the total costs), the size of the certified area has less significance in the total costs.

- FSC certification tends to be more costly due to the somewhat higher harvesting restrictions, with resulting decrease in the annual harvesting revenues. In Sweden and

Norway the decrease in harvesting revenues were estimated at 10-15% in FSC and PEFC based certifications. However, the estimates for the losses in stumpage price in PEFC and FSC certified forests were at the same level in Sweden and Norway.

- Costs on training and information are low in small group certifications but as the number of members and contractors increase from dozens to hundreds, training should be systematic and well organised which increases the unit costs to a point. In large group certifications the unit costs decrease again. The same applies to the costs of internal audits.
- The incremental costs of double certification according to PEFC and FSC standards are marginal when the auditing procedures are well streamlined and compliance with both standards is simultaneously assessed.
- The auditing costs (internal and external) represent a minor share of certification costs. In individual and small group certifications they can be significant but in large-scale certifications their role is marginal compared to the environmental investment. However, adequate inputs especially in internal auditing of forest owners and contractors increase the credibility of and commitment to certification, which is reflected in a cost-efficiency and results of external audits.

6.4.2 Certification Benefits

The quantitative benefits from forest certification in form of better forest management or market benefits have not been assessed in forestry organisations. However, the benefits of forest certification have been worth the extensive inputs and have proved to be a feasible tool to integrate environmental and social aspects into forest management and to communicate the achievements in the markets. Now that the forestry sector has made the efforts to improve the management, the certified timber should receive preference in the market.

6.5 Aspects Encouraging Participation of Private Non-industrial Forest Owners

Private non-industrial forest owners have viewed forest certification as an essential element in providing assurance on SFM at national and international levels. In all the three countries the forest owners' organisations have made a great effort in the development of national certification systems that would be accessible for individual forest owners. The following common aspects have contributed to the acceptance of forest certification among forest owners:

(1) Cost-efficient group certification arrangements, drawing on regional level forest owners' organisations have encouraged forest owners to participate in certification. If the decision on participation is made in connection with regular communication between the owner and his organisation certification becomes easily acceptable. Written commitment can be made separately or confirmed in writing when timber sales contracts are signed.

On the other hand only few private non-industrial forest owners have joined group certifications arranged by other organisations, e.g. forest industry. These options are more attractive to institutional forest owners.

This explains the low number of FSC certified private non-industrial forest owners in all three countries. Although auditing costs comprise only a marginal share of all costs related to voluntary environmental protection as required by certification standard, they can establish a critical cost barrier to individual or groups of forest owners.

(2) Forest owners need to be well informed on the implications of forest certification. Forest owners' organisations have through extensive training and information campaigns and individual discussions succeeded in informing forest owners on the benefits and responsibilities related to forest certification. There is however, a continuous need to inform and train forest owners and contractors.

(3) Certification rate among forest owners increases significantly if market demand is strong. In Adger-Telemark where forest owners' organisations trade only certified timber, the certification rate is close to 99%, in Gävleborg county where such direct demand does not exist the certification rate among private forest owners has still remained low (15%). In Pirkanmaa the promotion of certification was adopted as a major market challenge by all the involved actors.

Only real market demand from forest industry will increase the popularity of forest certification among private forest owners in long run. This demand is important for Forest owners' organisations to justify their inputs to forest certification. From the forest owners' point of view, the industry should promote the marketing of certified products to a much greater extent than at present.

(4) Price premium for certified timber is an effective tool to encourage forest owners' participation. In Norway and Sweden timber trading organisations and forest industry have paid price premiums with good results. In the Finnish regional certification the forest owners' participation could be ensured without premiums. Forest owners' organisations and sawmill industry linked to private forestry have been more positive towards price premiums than large-scale industry.

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Additional information received from:

Finland
Forest Certification Council, Finland
Forest Owners' Union of Western Finland
Metsähallitus
Finnish Association for Nature Conservation, Pirkanmaa
FSC certified Family Jalas Forest Manager
Regional Forestry Centre

Sweden
PEFC Sweden
Mellanskog
Regional Forestry Board in Dalarna-Gävleborg
Skogssällskapet Förvaltning AB
Skogscertifiering Mellansverige
Bergvik Skog AB
Stora Enso AB
Korsnäs AB
Holmen Skog AB
Sveaskog AB

Norway
PEFC Norway
Norske Skogseierforening
Agder Telemark Forest Owners' Association
Skogkonsult AB
Norske Skog AB
County Governor of Telemark

SAVCOR INDUFOR OY
Töölönkatu 11 A
FI-00100 Helsinki, FINLAND
Tel.: +358 9 684 0110, fax: +358 9 135 2552
indufor@ savcor.com
www.savcor.com