THE STATE
OF THE WORLD's
FOREST GENETIC RESOURCES

COUNTRY REPORT

DENMARK

This country report is prepared as a contribution to the FAO publication, The Report on the State of the World's Forest Genetic Resources. The content and the structure are in accordance with the recommendations and guidelines given by FAO in the document Guidelines for Preparation of Country Reports for the State of the World's Forest Genetic Resources (2010). These guidelines set out recommendations for the objective, scope and structure of the country reports. Countries were requested to consider the current state of knowledge of forest genetic diversity, including:

- Between and within species diversity
- List of priority species; their roles and values and importance
- List of threatened/endangered species
- Threats, opportunities and challenges for the conservation, use and development of forest genetic resources

These reports were submitted to FAO as official government documents. The report is presented on www. fao.org/documents as supportive and contextual information to be used in conjunction with other documentation on world forest genetic resources.

Danish Ministry
of the Environment
Nature Agency

State of the World´s Forest Genetic Resources
Country Report
Denmark

2011

Preface

Denmark's country report is prepared as a contribution to the FAO report - State of the Worlds Forest Genetic Resources. The content and the structure are in accordance with the recommendations and guidelines given by FAO (June 2010).

The report attempts to answer questions listed in the guidelines, when they are of relevance in a Danish context and information is available. To avoid overlap, descriptions of topics in the report sometimes cover several questions in the guidelines.

The report is prepared by the Nature Agency (Ministry of Environment) with contributions from Forest & Landscape, University of Copenhagen (Ministry of Science) and the Danish AgriFish Agency (Ministry of Food, Agriculture and Fisheries).

Content

Chapter 1. Introducing Danish forestry and Forest Genetic Resources

1.1 Introduction: Forest and forestry in Denmark

At the beginning of the 19th century approximately 2-4 % of Denmark was covered with forest. A strong legal protection was made in the year 1805, and has successfully been implemented and renewed in later Forest Acts.
According to the newest available statistic (2010) the forest area is 579.500 ha, and covers 13,5 % of the area. Other areas with trees covers 48.100 ha or 1,1 % of the area.
Forest area is increasing due to private and public afforestation.

Both indigenous and non-indigenous tree-species are important.
The most common tree species are:

	Indigenous	Non-indigenous	Share of forest area
Norway spruce (*Picea abies*)		X	16,2 %
Beech (*Fagus sylvatica*)	X		12,6 %
Pine (*Pinus* sp.)			11,7 %
- Pinus sylvestris	X		
- Pinus mugo		X	
- Pinus contorta		X	
Oak (*Quercus* sp.)			9,5 %
- Quercus robur	X		
- Quercus petraea	X		
Birch (*Betula sp.)*			6,5 %
- Betula pendula	X		
- Betula pubescens	X		
Sitka spruce *(Picea sitchensis*)		X	6,1 %
Nordmanns fir (*Abies nordmanniana)*		X	4,6 %
Sycamore (*Acer pseudoplatanus*)	X		3,5 %
Ash (*Fraxinus excelsior*)	X		3,4 %
Nobilis *(Abies procera)*		X	2,1 %
Other broadleaves	X	(x)	9,5 %
Other conifers		X	9,4 %
Unstocked			3,5 %
Unknown			1,9 %
Total			100,5 %

Forest management is regulated by the Forest Act. The purposes are to promote sustainable management and to preserve and protect the forest and increase the forest area.

Forests are distributed all over the country. In the south and eastern parts of the country broadleaves are dominating, whereas conifers are dominating in the western parts.
Many forest properties are relatively small: 20 % of the forest area is on properties smaller than 20 ha. 2/3 of the total area is owned by private owners and companies.

Danish forestry and its primary processing industry are characterized by small units and a low level of processing. Together with a high level of costs this results in low earnings. The economic importance is low. The value of these primary forest products gives only a marginal contribution (less than 1 ‰) to the Gross Domestic Product.
The economically most important parts of the forestry sector are the wood industry, furniture industry, energy sector and construction sector. But these sectors are not significantly dependent on the Danish forest resources.

Secondary products like lease of hunting and renting of houses constitute the majority of earnings at private forest properties. Wood production is also important along with the specialized production of Christmas trees and greenery.

The recreational values, the value for environmental protection, in particular ground water protection as well as the forests importance for biological diversity are widely recognized in the political debate about forestry.

Only the biggest forests have own employees. Use of consultants and entrepreneurs is common, and many operations are mechanized. National and regional consultancy companies exist along with one man companies.
The National Forest Association is the trade association of forestry, and handles the commercial and professional interest of the sector. Most of the members are forest owners.

FGR
The forest genetic resources form the basis for the forest sector.
The importance of the forest genetic resources is recognized. At the seed and plant market robust, healthy and suitable material is demanded.

Recent trends
The gross profit from timber production and for Christmas tree and greenery production has been declining and the importance of secondary products is increasing.
The recreational role and the biological value of forests are regarded as increasingly important.

The National Forest Program from 2002 suggests a conversion of Danish forestry to close-to-nature forestry and The Forest Act of 2004 provides the legal framework for this transition.

A Forest Policy Committee finalized its report in 2011.
The purpose was, to identify and analyze opportunities to meet the multilateral objectives for forestry in Denmark, based on the following objectives:
• Maintain and develop the forest as a welfare benefit, providing opportunities for outdoor recreation and nature experiences.
• Maintain and develop the potential of forests in relation to contributing to climate and environmental targets.
• Promoting sustainable forest management globally, regionally (Europe) and in the Nordic and Baltic region.

1.2 The current state of Forest Genetic Resources

Research based on provenance testing has been initiated for the majority of planted woody species native to Denmark. The distribution within Denmark has been sampled and tested for more than 30 species based on a Breeding Seed Orchard Approach. Plans for integrated management and conservation have been developed for all major native woody species planted in Denmark.

The methods employed to analyze and assess intraspecific variation covers:
Field testing to study adaptive variation, SSR markers to study genetic processes related to population size and gene flow/isolation including hybridisation.

Surveys and inventories of variation
Phenology (timing of flushing and/or leaf shedding) has been assessed and analysed for ten species: *Quercus robur, Fraxinus excelsior, Tillia cordata, Betula pubescens, Rosa dumalis, Malus sylvestris, Corylus avellana, Cornus sanguinea, Acer campestre* and *Prunus avium*. In all cases significant variation was observed between populations within Denmark. The studies also revealed presence of substantial within population variation for phenology corresponding to relative high heritability. Detailed studies on intra-specific variation in susceptibility to *Chalara fraxinea* (*Hymenoscyphus pseudoalbidus*) has been performed on *Fraxinus excelsior.* Interspecific variation based on neutral markers has been quantified for a subset of the species (*Quercus robur* + *Q. petraea* + *Fagus sylvatica* (allozymes), *Malus sylvestris, Ulmus glabra* and *Fraxinus excelsior* (SSRs). Effects of strong fragmentation due to Dutch elm disease on *Ulmus glabra* and *Ulmus laevis* on mating systems has been studied by SSR markers. Studies based on SNP markers are in the planning phase.

Knowledge about intraspecific variation can be used to promote the integrated conservation and use of well suited FGR.

Scientific approaches for monitoring genetic erosion and vulnerability
Studies trying to asses the risk associated with hybridisation has been implemented for native *Rosa* sp., *Prunus spinosa* and *Crataegus* sp. based on morphology and for *Malus sylvestris* based on a combination of morphology and SSR markers.

Chapter 2. In situ conservation

2.1 The state of *in situ* genetic conservation

The Danish in situ genetic conservation programme
The Danish gene conservation strategy for trees and shrubs was adopted in 1994. During implementation, the strategy has evolved, and today 81 species are included. The strategy emphasises the use of evolutionary *in situ* conservation as an important issue.
56 species are represented in the *in situ* conservation areas, located on public owned areas but administrated by the Nature Agency, Ministry of Environment. In 2010 the total area of *in situ* conservation was 2880 hectare.

The main target forest tree species in the *in situ* programme are:
Acer platanoides, Alnus glutinosa, Betula pendula, Betula pubescens, Carpinus betulus, Fagus sylvatica, Fraxinus excelsior, Populus tremula, Prunus avium, Quercus robur, Quercus petraea and Tilia cordata.

The conservation areas are designated on areas administrated by the Nature Agency. The designation as gene conservation area does not exclude other use of the area. Some areas are used for multiple purposes, while other areas are protected as Nature Conservation areas or by the Natural Forest Strategy. In every single case it is determined, that the areas are suitable and that other use is in accordance with the conservation guidelines. Purpose of the guidelines is to ensure genetic diversity and characteristics of indigenous populations of trees and shrubs. This is pursued by designating large populations which naturally regenerates and are protected from pollination by non-indigenous sources.

The target species are each represented in 5-15 *in situ* conservation areas.
E.g. Beech is an important native Danish species. The *in situ* conservation of beech consists of 13 designated areas. One area is used for multiple forestry purposes. The 12 other areas are protected areas or areas with designated conservation purposes.

The effort to sustain the *in situ* conservation network is based on administrative guidelines and a periodical survey of the designated areas. The Nature Agency undertakes the task as part of its administration of the state forestry. As the strategy is implemented, only minor revisions are regarded necessary to maintain the *in situ* conservation.

Numbers of protected in situ areas per species:
In situ conservation areas, some areas have several species represented

Species	**Number of areas**
Acer platanoides	6
Alnus glutinosa	15
Betula pendula	12
Betula pubescens	11
Carpinus betulus	10
Fagus sylvatica	13
Fraxinus excelsior	13
Populus tremula	16
Prunus avium	15
Quercus robur	14
Quercus petraea	9
Tilia cordata	5

Challenges to in situ conservation?
Conservation of some native species is performed without designation of *in situ* conservation areas.
Acer pseudoplatanus is a new indigenous species. It has probably been in Denmark for 3-400 years. But its use in forestry as well as human influence makes it difficult to designate relevant *in situ* areas for this species. Instead, conservation is implemented in 4 seed stands and 1 seed orchard.
Pinus sylvestris is an old indigenous species. Native populations were extinct due to over-exploitation of the forest resource. Today provenances originating form neighbouring countries are used. Conservation is performed in 9 seed stands and seed orchards.
In both the above cases the species are regarded as appropriate conserved.

Climate change, pests and fungi challenge gene conservation. Species such as *Ulmus* sp. and *Fraxinus excelsior* have recently demonstrated, that the balance of host and pathogen is very dynamic. Species and populations have declined substantially, but are still present in forests and conservation areas. The long term development is unknown, but it is expected that both species already have or will have to pass an evolutionary bottleneck lowering genetic diversity of the species significantly. But still, the structure of a gene conservation network both nationally and regionally is considered to assure options for a practical handling of this challenge.

Stakeholders, National Forest program and research
The implementation of gene conservation is conducted by the Nature Agency. There is not established a special forum of stakeholders. In general cooperation concerning development, use and management of forest genetic resources occurs through several established networks where scientists, seed-producers, nurseries, public authorities and other stakeholders are participating.

The strategy was established in 1994 and is included in subsequent national forest programs and activities, for example the latest national forest program and initiatives about biological diversity.
Currently, there do not seem to be a special need for increasing public awareness of gene conservation of trees and shrubs.

Gene conservation is inherently dynamic. Continuous interaction with research is of importance in order to incorporate relevant new knowledge in the gene conservation program. The Nature Agency is participating in both regional and national cooperation on genetic resources to support this: EUFORGEN, EUFGIS and NordGen.

Chapter 3. Ex situ conservation

3.1 The state of *ex situ* genetic conservation

In the Danish gene conservation of trees and shrubs *ex situ* conservation stands are part of the strategy. *Ex situ* conservation stands is of special importance for the introduced species used in Danish forestry. The conservation is closely linked to breeding programs, and all conservation units are active or former seed sources. In 2010 the total area of *ex situ* conservation areas and areas managed for seed production was 1591 hectare. Privately owned seed sources are not an active part of the conservation strategy.

The main target forest tree species in the *ex situ* programme are:
Abies alba, Abies grandis, Abies nordmanniana, Abies procera, Larix decidua, Larix kaempferi, Picea abies, Picea sitchensis, Pinus sylvestris, Pseudotsuga menziesii.

Main target forest tree species covered by both the *in situ* and the *ex situ* programme are:
Acer platanoides, Alnus glutinosa, Betula pendula, Betula pubescens, Carpinus betulus, Fagus sylvatica, Fraxinus excelsior, Populus tremula, Prunus avium, Quercus robur, Quercus petraea and Tilia cordata.

Target species are represented in 2-19 seed sources/*ex situ* conservation areas.
E.g. Norway spruce (*Picea abies*) is an important introduced tree species represented in 6 specific seed sources/conservation areas: 4 are active seed areas (3 clonal seed orchards and 1 seed stand) 2 are not active seed sources (1 former CSO and 1 new CSO from 1999).

E.g. Beech is an important indigenous Danish species. In addition to the 13 *in situ* conservation areas, 17 approved seed stands or seed orchards are identified as *ex situ* conservation areas. Some of the seed areas in principle fulfil criteria to be *in situ* areas, but they are not part of the *in situ* protection. This is due to the fact that it is not decided whether future regeneration should occur on the specific area. Some of the seed areas represent genetic resources originating form other sites.

Number of *ex situ* conservation areas (seed stands and seed orchards) (only listed for the species not covered by *in situ* conservation.)

Species	Number of seed production areas
Abies alba,	2
Abies grandis	2
Abies nordmanniana	17
Abies procera	6
Larix decidua	2
Larix kaempferi	2
Picea abies	4
Picea sitchensis	4
Pinus sylvestris	7
Pseudotsuga menziesii	7

The objective of the conservation strategy is to maintain a relevant basis (the genetic backbone) for future use of the species. Conservation of high levels of genetic diversity within each species has a special focus, as it plays an important role in the species potential of adaptation and ability to meet future challenges. The dynamic conservation of populations is prioritized. It is not the intention of the conservation strategy to attempt to conserve every forest genetic resource.

In general the gene conservation strategy does neither include seed collections nor collections in arboreta or botanical gardens. Clone-collections and field-trials are often part of ongoing breeding programs. Although these collections and trials might be suitable for gene conservation, they are not prioritized in the strategy.

Seed sources have – like other stands – a limited life-time, and eventually regeneration is relevant. Several scenarios are relevant, and must be evaluated from case to case:

- Regeneration might be possible in the stand.
- For many years the active seed sources will have abundant regeneration of the population on other localities. This provides an opportunity to select the population as a new *ex situ* population.
- New seed sources might be established.

A continuous work with the gene conservation programme is necessary in order to provide a sufficient number of viable *ex situ* stands that ensure the long term conservation. The Nature Agency undertakes the task as part of its administration of the state forestry.

Stakeholders, National Forest program and research
- see chapter 2.

Chapter 4: The State of Use and Sustainable Management of Forest Genetic Resources

The main objective of this section is to describe the use and sustainable management of forest genetic resources.

Genetic improvement programmes and their implementation.
A National seed improvement programme is implemented. A few private seed companies also have some breeding activities. This chapter covers the Governmental Improvement Program.

Several species are presently subject to tree improvement programmes.
Broadleaves: *Acer platanoides*, *Acer pseudoplatanus*, *Alnus glutinosa*, *Betula pendula*, *Betula pubescens*, *Carpinus betulus*, *Fagus sylvatica*, *Fraxinus excelsior*, *Prunus avium*, *Quercus petraea*, *Quercus robur* and *Tilia cordata*.

Conifers: *Abies alba*, *Abies bonmülleriana*, *Abies grandis*, *Abies nordmanniana*, *Abies procera*, *Chamaecyparis lawsoniana*, *Larix decidua*, *Larix kampferi*, *Larix* x *eurolepis*, *Picea abies*, *Picea omorika*, *Picea sitchensis*, *Pinus contorta*, *Pinus nigra*, *Pinus sylvestris*, *Pseudotsuga menziesii*, *Thuja plicata* and *Tsuga heterophylla*.

Both native and introduced species are part of the tree improvement programmes. And especially within the conifers the fraction of introduced species is high, as only *Pinus sylvestris* is considered indigenous.

Improvement objectives vary from species to species. The main objectives are quality and robustness. Specific objectives are listed below.

Conifers:
Abies alba: Growth and robustness
Abies bonmülleriana: Christmas tree quality, production potential (greenery) and time of bud burst
Abies grandis: Growth
Abies nordmanniana: Christmas tree quality
Abies procera: (Greenery used for Christmas decorations) colour and production potential
Chamacyparis lawsoniana: Stem straightness
Larix decidua: Stem straightness
Larix kaempferi: Stem straightness
Larix x *eurolepis*: Stem straightness
Picea abies: Christmas tree quality, stem straightness, density
Picea omorika: Christmas tree quality
Picea sitchensis: Stem straightness, frost hardiness and wood quality (Spiral grain, density)
Pinus contorta: Stem straightness and frost hardiness
Pinus nigra: Robustness
Pinus sylvestris: Stem straightness and robustness

Pseudotsuga menziesii: Stem straightness, frost hardiness, robustness and wood quality
Thuja plicata: Stem straightness
Tsuga heterophylla: Growth

Broadleaves:
Acer platanoides: Stem straightness
Acer pseudoplatanus: Stem straightness
Alnus glutinosa: Robustness and stem straightness
Betula pendula: Stem straightness
Betula pubescens: Stem straightness
Carpinus betulus: Robustness
Fagus sylvatica: Stem straightness
Fraxinus excelsior: Stem straightness
Prunus avium: Stem straightness
Quercus petraea: Growth, robustness and stem straightness
Quercus robur: Stem straightness, frost hardiness
Tilia cordata: Stem straightness

Both within conifers and broadleaves first and second generation improvement programs occur, depending on species.

The number of plus trees/families/clones tested in field trials varies from 2 to 200, depending on species. For species like *Picea abies* and *Picea sitchensis* the improvement have been intense while for species like e.g. *Chamacyparis lawsoniana* the level of improvement have been less intensive.

Number and size of seedling seed orchards.

Broadleaves - Species	Seedling seed orchard (SSO) number	Seedling seed orchard (SSO) Area (ha)
Acer platanoides	2	2,0
Acer pseudoplatanus	1	1,3
Alnus glutinosa	2	2,0
Betula pendula	2	2,0
Betula pubescens	2	2,0
Carpinus betulus	0	0,0
Fagus sylvatica	0	0,0
Fraxinus excelsior	2	2,0
Prunus avium	5	5,0
Quercus robur	6	35,0
Quercus petraea	1	5,0
Tilia cordata	0	0,0
Total	23	56,3

Conifers - Species	Seedling seed orchard (SSO) number	Seedling seed orchard (SSO) Area (ha)
Abies alba	0	0
Abies grandis	0	0
Abies nordmanniana	0	0
Abies procera	2	6
Chamaecyparis lawsoniana	0	0
Larix decidua	0	0
Larix x eurolepi	0	0
Larix kampferi	0	0
Picea abies	0	0
Picea omorika	0	0
Picea sitchensis	0	0
Pinus contorta	0	0
Pinus mugo var. rostrata	0	0
Pinus nigra	0	0
Pinus sylvestris	0	0
Pseudotsuga menziesii	3	5
Thuja heterophylla	0	0
Tsuga plicata	0	0
Total	5	11

Number and size of clonal seed orchards.

Conifers - Species	Clonal seed orchard (CSO) number	Clonal seed orchard (CSO) Area (ha)
Abies alba	2	7
Abies grandis	7	9
Abies nordmanniana	10	36
Abies procera	3	8
Chamaecyparis lawsoniana	0	0
Larix decidua	0	0
Larix x eurolepi	1	2
Larix kampferi	1	1
Picea abies	5	16
Picea omorika	0	0
Picea sitchensis	5	17
Pinus contorta	0	0
Pinus mugo var. rostrata	0	0
Pinus nigra	0	0
Pinus sylvestris	4	7
Pseudotsuga menziesii	4	8
Tsuga heterophylla	0	0
Thuja plicata	0	0
Total	42	112

Broadleaves - Species	Clonal seed orchard (CSO) number	Clonal seed orchard (CSO) Area (ha)
Acer platanoides	0	0,0
Acer pseudoplatanus	0	0,0
Alnus glutinosa	0	0,0
Betula pendula	0	0,0
Betula pubescens	0	0,0
Carpinus betulus	0	0,0
Fagus sylvatica	0	0,0
Fraxinus excelsior	4	7,0
Prunus avium	0	0,0
Quercus robur	0	0,0
Quercus petraea	0	0,0
Tilia cordata	2	2,0
Total	6	9,0

Besides the seedling seed orchards (SSO) and the clonal seed orchards (CSO) a number of approved stands is part of the sustainable management of forest genetic resources.

Clonal and gene banks
Denmark has no permanent clonal banks or gene banks.
As part of the breeding programme clonal archives are used and maintained for a shorter period of time.

Use of improved reproductive material
The promotion of improved reproductive material is regulated by law. Thus, promotion of material is only allowed if the material is approved. In order to get the material approved it needs to be better than average material.
Furthermore the users are in several ways encouraged to use the improved reproductive material:
- Through articles in papers relevant for e.g. foresters, Christmas tree growers and nurseries.
- At conferences relevant for foresters, Christmas tree growers and nurseries.
- Through short descriptions of the seed sources distributed to foresters, Christmas tree growers and nurseries.
- Through the web portal www.plantevalg.dk - a web tool which can be used for selection of best plant species and provenances at a given locality.

A data base is established which keeps track of origin, identity and number of all trees in the breeding programs.

The state of access and benefit-sharing
The objective is to have an open and easy access to the forest reproductive material. This implies that upon request material from all species can be made available.
No participatory tree breeding programmes are established.

Availability of reproductive materials
Upon request material from all species within the breeding programs can be made available. Improved reproductive material is available in commercial scale for all the species where CSOs and SSOs are listed above.

The classification of improved reproductive material follows the EU regulations as well as the OECD guidelines.
No variety release is registered.

Chapter 5: The State of National Programmes, Research, Education, Training and Legislation

The main objective of this section is to describe the state of national capacities in research, education, training and legislation as well as coordination and information mechanisms for forest genetic resources.

Institutions engaged in field and laboratory work related to forest genetic resources conservation and tree improvement, education, research and training.
University of Copenhagen studies genetic patterns and processes of woody plant species in Denmark combining field trials and genetic markers.

University of Copenhagen collaborate with private and public seed source owners on breeding based on genetically sound principles, teaches plant breeding and conservation genetics. Also, University of Copenhagen advises planters on site and purpose specific choice of best seed sources based on the website www.plantevalg.dk – a webportal developed and managed by the Nature Agency.

University of Copenhagen has been involved in a number of studies of genetic resources of woody plants in Denmark.
A large number of projects are related to forest genetic resources.

National Legislation about FGR seed production and breeding
As an EU Member State, Denmark follow Community rules for import, export and trade of forest seed and reproductive material. The rules address both certification and plant health aspects. In order to support the conservation of forest genetic resources, material intended for conservation purposes can be exempted from the general rules on certification. For trade outside EU, Denmark follow OECD rules and guidelines. Both EU and OECD rules are regularly updated and adjusted.
Updated information about legislation and approved seed sources are available on the web.

Treaties, agreements, and conventions related to forest genetic resources conservation and management.
Denmark has ratified:

- Convention on Biological Diversity, which lay out general rules for access and benefit sharing to genetic resources, including forest genetic resources,
- FAOs international treaty on plant genetic resources for food and agriculture (has established a multilateral system for access and benefit sharing to plant genetic resources for food and agriculture. However, the treaty does not include forest genetic resources),
- UPOV Convention (intellectual protection of plant varieties, Plant Breeders Rights),
- International Plant Protection Convention (plant health)

Awareness of the roles and values of FGR is of particular importance for foresters, land owners and other similar stakeholders. Currently, there do not seem to be a special need for increasing public awareness of forest genetic resources.

Chapter 6: The State of Regional and International Collaboration

Denmark is participating in regional and international programs on forest genetic resources.
Regionally cooperation has been at the Nordic and European level.

Permanent Nordic cooperation - SNS and NordGen
Nordic collaboration on research, conservation and use of forest genetic resources is organized and financed by the Nordic Council of Ministers. The aim is to strengthen and coordinate common activities in the Nordic countries. The forest genetic resource activities are mainly carried out through the Nordic Forest Research Cooperation Committee (SNS) and NordGen Forest.

Permanent European cooperation, EUFORGEN
EUFORGEN is a European collaboration concerning forest genetic resources. The aim is to facilitate development of strategies and methods as well as improve the management of forest genetic resources.

National benefits from international cooperation cover many different aspects, even whitin the defined area of FGR. In general, a joint effort can gather resources and thereby create better results than the national effort would have been able to.

Some examples:

- European research on European oaks (OAKFLOW) have improved the knowledge about gene flow, population dynamics and species hybridization
- A European GIS-system (EUFGIS) has created an online information system for forest genetic resources inventories in Europe to support the countries in the efforts to implement FGR conservation. As part of the project European minimum requirements and data standards for the dynamic conservation units were developed.
- A Nordic project explored the field of legislation and regulating access and exclusive rights to forest genetic resources in the Nordic region.
- Nordic Conferences and thematic days contribute to upgrade skills in the field of forest genetics through the dissemination of experiences, methods and research results.

Chapter 7. Access to Forest Genetic Resources, sharing of benefits

As mentioned in Chapter 5, Denmark has ratified the Convention on Biological Diversity, which lay out general rules for access and benefit sharing of genetic resources.
Denmark has also signed the Nagoya protocol, and work towards a national ratification.

An open market of seed and seedlings is the present basis of access, exchange and benefit sharing of forest genetic resources in Denmark.

The main law regulating exchange of Forest Genetic Resources is the ‘Law on seeds, potatoes and plants, No. 261, 26. April 1999’.25 This Act is the implementation of EU directive 1999/105. This basically targets preparations for marketing and marketing propagating material for commercial sales.

The market of forest genetic resources (FGR) covers exchange within and between countries. It is regarded as simple and non-bureaucratic. A recent report (2011) about access and rights to Forest Genetic Resources in the Nordic Region concluded, that this system is functioning well.
No crucial problems were identified regarding ownership, access or exchange of FGR. The regulations at global and European level are being implemented at national levels. And it was stated, that currently patents have neither been a strong incentive for the forest sector nor entailed important obstacles for innovation in the field.

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