

The Danish Forestry Extension Programme

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Introduction

In Denmark, forests cover approximately 486,000 ha, corresponding to around 11% of the total land area. The forests are fragmented and often very small. Out of a total annual wood consumption of 8 million m³, around 25% are produced nationally. Some 72%, or 348,000 ha, of the forest area is privately owned, with around 124,000 ha of that land being owned by funds or pension companies. The remaining 28% is publicly owned and largely composed of state forests. Around 2,000 people are employed in the primary forest sector, while the secondary wood product industry employs around 14,000 people and is a major export business. Danes value their forest, and it is estimated that on average each of the 5.3 million Danes go for walks in the forest 11 times per year.

There is now little natural forest left in Denmark, and large parts of the forests are quite uniform and often with limited value for biological diversity protection and recreational purposes. Almost 37% of the forests are deciduous, while the remaining are planted with non-native coniferous tree species. A recent development during the last 10 years is that the fraction of deciduous forest is now increasing, while it previously used to be decreasing. This development is triggered through state afforestation, financial incentives and a negative development in soft-wood prices. The Danish forest cover is still increasing through public afforestation and private afforestation promoted through incentives. But still, Denmark is a relatively forest-poor country, with only around 0.1 ha of forest per capita, as compared to Sweden, where the number is 2.8 ha.

In Denmark, the forest sector is under the jurisdiction of the Ministry of Environment. Implementation of national and international forestry responsibility has been delegated to the Danish Forest and Nature Agency, which oversees 25 forest districts, and manages the 24% of the forest area owned by the state. The Ministry of Environment also includes three public sector research institutions that conduct forestry research. These institutions contribute significantly to knowledge building in the forest sector.

Among other ministries of relevance to the forest sector is the Ministry of Food, Agriculture and Fisheries, particularly due to the co-ordinating role of the ministry in the fields of land use and plant genetic resources.

The 14 Danish counties also have an important role in terms of forest management, due to their responsibilities and authority in accordance with the Nature Protection Act and the National Planning Act. They are, for instance, responsible for the designation of potential areas for afforestation.

Private forest owners in Denmark are well-organised in various local and national associations, which provide consultancy services to the forest owners (partly supported by the state) as well as practical assistance and forest policy activities.

The Danish timber industry

There are approximately 2,000 companies in the Danish timber industry, with around half of these companies belonging to the furniture industry. The timber industry and the furniture industry consist of small as well as large enterprises, including producers, suppliers and manufacturing companies.

Industry is supplied with timber from Danish forestry and from imports. The annual forest harvest in Denmark about 2 millions m³. Since the annual consumption of timber products is only around 7 million m³, considerable imports of timber are required.

The Danish Forestry Extension Programme

Besides the public and the public-funded private subsidized afforestation in Denmark, non-public-funded private afforestation also takes place. This private afforestation has partly been encouraged by various alterations to the legislation on agriculture, cadastral conditions and tax-systems. Forestry extension provides farmers and landowners with access to organizations or individuals with knowledge of laws and programs that can help with afforestation projects.

Forest extension in Denmark is concentrated in two large private organizations, the "Danish Forestry Extension" (see below) and the "Danish Land Development Service". In addition to these companies there are some smaller private associations, a number of private individuals and local national forest districts. Extension officers or managers of large forest districts are typically advised by The Royal Veterinary and Agricultural University, DFLRI, along with two private organizations, The Decoration Greenery Section and the Danish Forestry Society. The latter two organizations also advise larger forest owners and large producers of Christmas trees and greenery.

These private organizations also offer services that entail the handling of forest products sales of logs, timber, decoration greenery, and Christmas trees, often on a commission basis. Their services can also include assistance with logging or planting operations. Sale of plants or materials like fencing material and fertilisers are also typical services of the private forest advisors.

The Danish Forestry Extension consists of 15 local units known as Forest Owners Associations. These units offer consulting services to forest owners and are owned by the forest owners themselves via their membership of the unit. Each unit is typically headed by a board of five to nine members that are chosen by the membership. The Danish Forestry Extension currently represents approximately 7,000 forest owners with a total of 70,000 ha of forest land equivalent to 25% of private Danish forest.

History

The Danish Forest Act of 1805 introduced the concept of forest reserve, which was applied to the majority of forestland at the time. Forest reserve could, in principle, not be converted to other land uses and management had to comply with good forestry practices, primarily aimed at wood production.

In the late 1880s Danish forestry science produced large steps forward, but, unfortunately, only the larger forest estates were able to take advantage of this progress.

In 1896 The Danish Forestry Society suggested the establishment of an official forestry extension service for forest owners with small forests only, and since 1904 the Government has encouraged small woodlot owners to form associations in order to take advantage of economies of scale.

During this period, the Danish Forestry Society decided to support independent private forestry consultants in their work for smaller forest owners. In 1904 the first local Forest Owners Association was founded in Vejle, Jutland, and at this time Government grants were made available to these associations for engaging a forest graduate, usually with the goal of increasing wood production. This production was used both for private sales and consumption, and also for providing labour opportunities during slack periods in the agricultural cycle. In this way, even properties smaller than 50 ha could be managed in a sound way.

In the beginning the DFS had 163 members with a total of about 1,300 ha forest land. The primary aim of the Association at this time was to offer forestry extension services to its members. The next local Forest Owners Association was founded in 1907, also in Jutland.

Consultants were financed partly by membership fees and partly by The Danish Forestry Society, and smaller forest owners strived to obtain state subsidies for forestry extension services. A committee under The Danish Forestry Society analysed the silvicultural status of the smaller Danish forests, especially in Jutland, and presented their findings and proposals to the Ministry of Agriculture. Consequently, the act which made it possible for the ministry to grant local Forest Owners Associations to run a forestry extension service for their members was introduced in 1919.

The 1919 act and the reunion of the southern part of Jutland with the rest of Denmark led to the establishment of several new local Forest Owners Associations in Jutland and in the island of Funen. The recession of the 30s slowed down the process. New Associations were not founded, but those existing were increasing efforts to members by hiring additional staff for the extension service. The number of members was growing and so was the attached forest area. In 1939 the 7 local Forest Owners Associations had a total of 2,200 members and 13,000 ha forest land.

The outbreak of World War II and the compulsory fellings started the establishment of new Associations. The first local Forestry Extension in Sealand was founded in 1940. The same year the nine existing Associations founded "De Danske Skovdyrkerforeninger" (DFE) to be able to act jointly and represent the forest owners' interests on a national basis. By 1965 DFE consisted of 16 local units with 5,300 members and 34,700 ha forest land altogether.

With increasing affluence of Danish society in the 1960s, a need to revise forest policy arose. Outdoor life was becoming more popular, resulting in an increase in visitors to public forest areas, which gave rise to heated political debates around access to private forest land. In 1969 an amendment to the Nature Conservation Act was passed, which granted public access to private forests. This was the first instance of the multiple-use concept being deliberately applied to Danish forestry policy, and helped justify the use of public funds to support private forestry.

As a result, since 1969 private forests have been open for public access on roads and pathways from 7am to sunset. Moreover, many private forest districts have followed State forest districts in establishing various facilities for public use, such as playgrounds, simple camp sites, information boards, visitor centres, barbecue sites, bird-watching towers, etc. Forest owners, private and public, also make their forest available on a voluntary basis for local schools for education purposes.

A new Forest Act was passed in 1989, in part to stem the declining area of beech forest, the country's national tree. The new Act changed Denmark's fundamental management principle from being one of "good forestry", to one of "good and multiple-use forestry". This allowed for

the development of a new grant scheme, which in part targeted at an increase in broadleaved stands.

In the 1990s the government committed to doubling the nation's forest area within one rotation (80-100 years), through state afforestation and financial support to private afforestation. Financial incentives were to be increased through the use of financial incentives, and a profitable private forestry was to be maintained. Support to forest improvement in private forests was to be provided, with an emphasis on economic outputs and a furthering of "near-natural" management.

These objectives were included in the 1996 Forest Act, which maintained the fundamental principles of the previous Act, but changed its intentions into obligations. Thus, all essential Government grant schemes were incorporated into the Act, including support for private afforestation of farmland and professional assistance for small woodland owners associations.

The 1997 Forest Act, which was in effect until the 2004 Forest Act was recently passed, had four primary objectives:

- Conserve and protect the Danish forests.
- Improve the stability of the forest sector, the ownership structure and the productivity.
- Contribute to increasing the forest cover.
- Strengthen the advisory service and information on good and multiple use forest management.

In 2000 the previous ten years of the Danish afforestation efforts were evaluated. It was concluded that while the overall quality was rather good, more emphasis should be put on nature considerations. Furthermore, the afforestation efforts were running behind schedule. If the forest area was to be doubled within a tree generation, 40,000 – 50,000 ha needed to be afforested over a period of ten years, whereas afforestation to date had only reached 30-35% of this target. It was believed that this was mainly due to the high cost associated with afforestation activities in publicly owned as well as private forests, and competition with other land-uses, mostly agriculture.

On this basis, it was decided to develop a National Forest Programme based on the changing conditions of the Danish forest sector and the obligations outlined in the various international agreements and conventions to which Denmark is party.

The current Danish National Forest Programme has been developed through extensive consultations involving all relevant stakeholders, including a public hearing process. The process was initiated by broad public debate (including Internet debate) on how the population wants their forests to look, and how they want to use them. Thematic meetings, a conference, excursions and discussions have been undertaken with participation of a wide range of stakeholders, and the Programme has been widely circulated for comments in a public hearing process. Results from recent research projects were also included in programme development.

The debate revealed that the general Danish public is more interested in the recreational aspects of forests than the production-related aspects of forest management. Forests with a varied structure, a rich fauna and calmness seem to be preferred by the majority of Danes. The more professional part of the debate revolved around protection of natural forests, designation of untouched forest areas and forest grazing.

As a result, the main objective of the National Forest Programme is full implementation of sustainable forest management, which incorporates economic, ecological as well as social

considerations. Among the objectives of this Programme is that forest landscapes should cover 20-25% of Denmark after one tree generation (80 – 100 years), and the scope and potential for natural habitats and processes should be strengthened.

The main instruments to achieve the objectives of the current forest policy are:

- Adaptation of legislation
- Dialogue
- Research and development
- Awareness raising, dissemination of information and training
- Economic incentives
- International co-operation

Why did Denmark develop this system?

As discussed earlier in this document, there has been recognition in Denmark, from quite early on, that only large forests can support a complex forestry administration, complete with its own forest supervisor, foresters, and other infrastructure. Since the forests in Denmark tend to be smaller and medium-sized, the government also recognized that landowners could capitalize on economies of scale by taking part in a fully extended forest management agreement.

To achieve this, in 1896 the Danish Forest Society suggested the establishment of an official forestry extension service for forest owners with small forests only, and since 1904 the Government has encouraged small woodlot owners to form associations.

Forestry extension now provides farmers and landowners with access to organizations or individuals with knowledge of laws and programs that can help with afforestation projects.

Forest extension in Denmark is concentrated in two large private organizations, the "Danish Forestry Extension" (DFE - Skovdyrkerforeningerne in Danish) and the "Danish Land Development Service". In addition to these companies there are some smaller private associations, a number of private individuals and local national forest districts. Extension officers or managers of large forest districts they are mainly advised by The Royal Veterinary and Agricultural University, DFLRI, along with two private organizations, The Decoration Greenery Section and the Danish Forestry Society. The latter two organizations also advise larger forest owners and large producers of Christmas trees and greenery.

These private organizations also offer services that entail the handling of forest products sales of logs, timber, decoration greenery, and Christmas trees, often on a commission basis. Their services can also include assistance with logging or planting operations. Sale of plants or materials like fencing material and fertilisers are also typical services of the private forest advisors.

Danish Forestry Extension now represents more than one third of Denmark's approximately 20,000 forest owners, Christmas tree and greenery producers.

How does the DFE operate?

The Danish Forestry Extension consists of 10 local units called "Forest Owners Associations". These units offer consulting services to forest owners and are owned by the forest owners themselves (most of which are also farmers) via their membership of the unit. This structure is comparable to similar arrangements for agriculture in other countries.

Each unit is typically headed by a board of five to nine members that are chosen by the membership. The Danish Forestry Extension currently represents approximately 7,000 forest owners with a total of 70,000 ha of forest land equivalent to 25% of private Danish forest.

The 10 local units offer members a fully developed forest administration with a staff of professional foresters supported by administrative personnel. The local units are owned by their members and headed by a board of directors chosen by the members. They have independent economics and personnel policy.

The board of directors employ a forest supervisor and additional staff. In the local Forestry Extension offices forest supervisors are in charge of the daily administration and extension services, while the board of directors is responsible for the overall policies, budgets and fees of the local unit. The local units are interrelated in both formal and informal ways. In this way, it is possible for each of the units to act with more weight, when necessary.

The formalised cooperation between the 10 units is organised by DFE situated in Frederiksberg, Copenhagen.

What services are offered?

According to DFE (2004), the local units offer the following services to members:

Consultancy:

- Silviculture, thinning, sale of products and reforestation;
- Sustainable forest management;
- Production of Christmas trees and greenery, including choice of species, management, shearing and trade;
- Forest management plans; and
- Legal advice concerning The Forest Act, Nature Protection Act and other legislation affecting forest owners.

Sale of forest products:

- Measuring and quality classification of wood products;
- Marking of Christmas trees; and
- Sale of wood products, Christmas trees, greenery, wood-chips and more.

Contracting:

- Selective cutting and clear-cuttings, mechanised as well as manual;
- Skidding of wood and chipping of wood;
- Soil preparation (scarification);
- Planting on farmland as well as in the forest; and
- Cutting and processing of Christmas trees and greenery.

Purchasing:

- Seedlings for timber production, Christmas trees, shelterbelts and land-scape;
- Fences and fencing material;
- Christmas tree net and other materials for Christmas tree production;
- Fertiliser and plant protection products; and
- Tools and safety equipment.

Information about forest policy and guidelines as to practical management issues are provided by publications produced by the Danish Forest and Nature Agency, the research institutions and partly by the private organisations. The series “SKOV-info” for example provides information about good and multiple-use forestry management and is published in collaboration between the Danish Forest and Nature Agency, Danish Forest and Landscape Research Institute, Danish Forest Association, Danish Land development service and Danish Forest Extension.

Danish silvicultural management is founded on the principles of multiple-use forestry, meaning that forests should be managed with an emphasis on maintaining or improving the production of timber and other products, in conjunction with activities relating to natural history, history, environmental protection and recreation. This multiple-use approach is achieved through an integration of activities that ensures that several activities are carried out in the same area.

How is the system funded?

The Ministry of Environment in Denmark can, according to the law, subsidise forestry extension services, such that transaction costs are partly covered through government subsidization, with the remainder of costs covered through charging for services rendered.

As mentioned above, a major component of Danish forest policy is an effort to secure a sustainable economic framework for the forest sector. This means that forest management activities must at least break even in terms of the capital and manpower that have been invested. This approach allows the forest sector to implement sustainable forest management, including objectives for outdoor recreation and biological diversity.

What are the eligibility criteria for the different funds/facilities?

Subsidies are given for consultancy services on forest properties composed of less than 250 ha, provided that the Forestry Extension service is based on:

- at least 50 attached forest owners,
- a total area of forest land of more than 1,000 ha,
- that the Forestry Extension employs at least one full time advisor dealing only with consultancies to private forest owners, and
- that the Forestry Extension runs a national general office.

Has the system been effective in promoting afforestation?

In 2000, the previous 10 years of Danish afforestation efforts were evaluated. This study, conducted by the Ministry of the Environment, concluded that while the overall quality of past afforestation efforts was good, more emphasis should be put on nature considerations.

Furthermore, afforestation efforts were seen to be running behind schedule. If the forest area is to be doubled within a tree generation, some 40,000 – 50,000 ha should be afforested over a period of 10 years, yet afforestation had only reached 30-35% of this target. The study concluded that this was mainly due to the high cost level associated with afforestation activities in publicly owned as well as private forests, and competition with other land-uses, mostly agriculture, which tended to constrain afforestation efforts.

Future efforts

Efforts to achieve a 20-25% forest landscapes in Denmark will continue. Biodiversity and recreational objectives will be given increasing importance in Danish forestry policy, and the principles of near-to-nature forest management will be used as the basis for future afforestation operations. A larger proportion of the areas designated for afforestation will likely be left to natural succession and regeneration processes.

Seeds and plant material of preferably indigenous species, and species which are well-adapted to the local conditions, will be selected for future afforestation efforts. The location of new forests will also be decided with due consideration to the need for landscape corridors and amenity.

Previous experience in Denmark has shown that economic incentives are a prerequisite for afforestation on privately owned land. The challenge for Denmark now is to reduce costs and mobilise alternative financial sources. It is believed that natural succession and regeneration may reduce costs, and that alternative financing may include CO₂ sequestration, groundwater protection measures and co-financing in order to achieve recreational values, air quality improvement and protection of the aquatic environment.

Future subsidised afforestation efforts will continue to prioritise size, continuity with existing forests, localisation, landscape considerations and proximity to urban areas. In state forests afforestation areas will also take into consideration areas where the forest cover is relatively low.

What is required for this mechanism to work?

As is the case in other countries such as Japan and Ireland, forestry cooperatives have played, and continue to play, a crucial role in the dissemination of information and extension services to private landholders. Cooperatives in these countries, however, are well-established, and government funding for them has been a part of forest policy for many years.

Growth in afforestation over the past century in many other developed countries, by contrast, has often been driven by policy decisions from the top down, such that forestry cooperatives do not currently exist on a large scale in many of these countries. Indeed, although there are long traditions of farm cooperatives to aid small operators in many countries, forestry cooperatives are not as common in general.

Typically, farm cooperatives are engaged in processing and marketing, whereas forestry cooperatives get involved much earlier on. A cooperative provides a framework within which the members (or shareholders) can formalize their relations with each other. It also has the ability to raise money, which may make it easier for small businesses to grow and develop. Moreover, it can also be considered a 'body corporate', with the ability to give credit and borrow money.

Forest cooperatives help by allowing landholders to take advantage of economies of scale, both in terms of helping landowners to plant in adjoining areas, and by providing access to bulk pricing on goods and services. For landowners planting smaller forested areas, start-up costs can be prohibitive, particularly in terms of fencing, seedlings and specialized equipment, and small plots may be too small to become viable economic units. Government support for such cooperatives can be an efficient use of resources, and can actually become self-financing if tax receipts on harvested wood are taken into account.

What basic elements are needed?

Emphasis on financial returns

Discussions with the private sector have shown that although participation in afforestation is likely to be improved through the provision of grant money, it will also be improved if investors and landowners are convinced of plantation viability. This can only be achieved through a currency-based benefit-cost analysis that shows the financial returns to be gained from participation in the sector.

Moreover, from the government's perspective, financial support for regional cooperatives also needs to take into account regional realities, in order to ensure that funding is directed towards areas of a country that are most likely to have positive returns from forestry. The Danish system is able to do this by requiring a certain level of self-sufficiency from DFE.

Quantification of market and non-market benefits

As mentioned earlier, the Danish government has, in recent years, begun to put more emphasis on the importance of non-market benefits, including environmental benefits. Countries interested in improving government-support for forestry extension will also need to take these benefits into account. A benefit-cost analysis that includes such valuations is likely to provide justification for a larger government stake in any lending or support program.

Protection of ecosystems, biodiversity or erosion control, for example, provide very real benefits that governments (municipal, regional, provincial or federal), or indeed individuals or conservation organizations, may be willing to invest in. Similarly, a currency-based quantification of many secondary market benefits, such as tourism and hunting receipts, may also interest various levels of government or landowners in providing support for plantations, and help ensure that plantations are well-maintained.

Formation of a forestry credit and funding system

Along with a support system for cooperatives, some sort of financial distribution system is also generally required if support for forestry cooperatives and the distribution of loans is to be implemented. And while support for cooperatives may be feasible through an expansion of existing regional or federal government forestry structures, a credit system designed to run through existing financial systems, and based on government criteria, might function better for loans. Such financial institutions already have the ability to process loans, and the infrastructure to deal with the dynamics of regional demands.

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