

FINLAND'S NATIONAL FOREST PROGRAMME 2010

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Foreword

In February 1998 during the final stages of the total reformation of forest legislation in Finland the Government decided to initiate the drafting of a National Forest Programme. This programme is designed to meet the demands set by international forest policy, but it will also have far-reaching effects in Finland. The programme's aims are directed towards securing employment and income based on forestry, assuring the diversity and health of forests and, finally, allowing people the special kind of recreation and leisure that only the forests can offer.

In substance the National Forest Programme is more extensive than any similar programme Finland has had before. Issues, such as ecological, social and cultural sustainability combined with forestry know-how have received much greater attention. The drafting process has been carried out through team-work in an open and public-spirited atmosphere, which allowed everybody with interest in forests to participate.

The National Forest Programme will be implemented, reviewed and developed in the same atmosphere of public involvement in which it was created. The reformed forest and nature protection legislation has provided the framework for the Forest Programme. Furthermore, the Government plays an important part in the development of the operational conditions for forestry, the forest and wood products industries, the small and medium-size enterprises and environmental protection, research and training. The task of the various parties involved is to ensure that the forests are utilised in the best possible way in the interest of sustainable development and protection.

The forests are still of great importance for the welfare of the whole Finnish population. Wisely managed, used and protected, the forests will provide an inexhaustible source of material and spiritual riches for present and future generations. Accordingly, I express my warmest gratitude to all the parties and persons involved in the preparatory work of the Forest Programme for their valuable contribution and for a job well done.

Kalevi Hemilä

Minister of Agriculture and Forestry

Summary

The National Forest Programme continues the tradition of Finland's previous forest programmes. Its contents stretch over a larger range of topics than before and cover forest utilisation as seen from an economic, ecological, social and cultural perspective. In addition to domestic demands, the programme is designed to meet the new international forest policy norms. The programme has been compiled through a wide-spread process, open to interest groups and citizens. The programme is a process: it will be implemented and revised according to changing demands and incoming feedback. This process will be supervised by a Forest Committee still to be nominated, and assisted by its ad-hoc work groups, a Forum for Innovation and public forums.

The fundamental idea behind the programme is that a competitive forest cluster combined with the fact that forests are a renewable resource, make an excellent foundation for sustainable development.

The aim is to increase the forest industry's annual use of domestic roundwood by 5 - 10 million cubic metres by the year 2010, to double the value of the wood industry's exports to EUR 4.2 billion per year and to increase the annual use of wood for energy production by 5 million cubic metres. In collaboration with companies and entrepreneurs the Government will ensure good, competitive conditions for the forest industry; such as competitive energy prices, an adequate road network and technology and development programmes for the wood industry and the use of wood energy.

An increase in the production of industrial roundwood to a target rate of 63 - 68 million cubic metres per year calls for a raise in silvicultural and forest improvement investments to their former level of approx. EUR 250 million per year. The forest owners' share of the increase will be approx. EUR 65 million, the Government's share including EU financing approx. EUR 17 million. These additional investments show a positive return for the owners and the State. The Government will concentrate its efforts particularly on forest planning and on advising and training forest owners. An increase in production will improve the employment within forestry and the forest industry by 10,000 - 15,000 working years, but due to a simultaneous increase in productivity the total employment within the forest sector will drop from 95,000 to 80,000 working years by the year 2010.

The ecological sustainability of forests will be secured by a further development of the ecosystem management of commercial forests based on the environmental programme for forestry of 1994. The subsidy for ecosystem management will be increased. The environmental load caused by forestry will be reduced in accordance with the Government's resolution regarding water protection. Ratified Conservation Programmes concerning privately owned land will be carried out during 1996 - 2007 at a cost of EUR 600 million of budget money reserved for this purpose. In addition, an ad-hoc work group representing a wide range of expertise and interests will be appointed to estimate the needs for forest protection based on research and to produce a Forest Conservation Programme, including financial and social aspects and covering the south of Finland, the western parts of the province of Oulu and the south-western region of Lapland.

Principally, the increase in forest management will be concentrated on young stands (150,000 - 250,000 ha p.a.), first thinnings (100,000 - 250,000 ha p.a.) and ditch cleaning and supplementary ditching (75,000 - 110,000 ha p.a.). With respect to forest road construction the focus will be diverted from building to renovation and improvement work. The follow-up procedures for forest and ecosystem management and harvesting damage will be developed.

Hunting, reindeer husbandry, wild berry and mushroom picking, landscape and cultural values, outdoor recreation and tourism will be taken into account and advanced within forest management and protection.

Forestry know-how and innovative activities within the forest sector will advance by means of developing research, implementation of results and training. A Forum for Innovation will be formed in order to increase the interaction between the parties representing theory and practice.

By taking an active part in the international forest policy, by forest research and training co-operation and by media exposure about forests and the environment, Finland will secure its own interests and further sustainable forestry.

The fulfilment of the National Forest Programme will increase the forest and wood products industry's export sales by EUR 1.7 - 3.4 billion by the year 2010. It will increase the Treasury's balance of trade by EUR 0.8 - 1.5 billion and Public finance by EUR 1.2 - 2.2 billion per year. Also on an annual basis the harvesting income for the forest owners will rise by EUR 120 - 250 million, the Treasury's forest tax revenue by EUR 35 - 65 million. The higher level of productivity in forest production will improve the profitability of forestry from EUR 97 to EUR 103 - 104 per hectare per year. A large proportion of the increasing flow of income will benefit the rural population and, consequently, contribute to the development of rural regions. The programme will provide for the forest sector 10,000 - 15,000 more working years in 2010 than would be available without this programme. The total effect of the programme on the national economy will be 35,000 - 45,000 working years.

Prior to the implementation of the programme a detailed environmental impact assessment will be made, which, if necessary, may lead to some further adjustments. Apart from governmental actions, the programme is dependent on decisions and actions taken by the forest industry and the forest owners. If any part of the programme cannot be realised along the lines that have been planned, then the whole programme will have to be checked and adjusted accordingly.

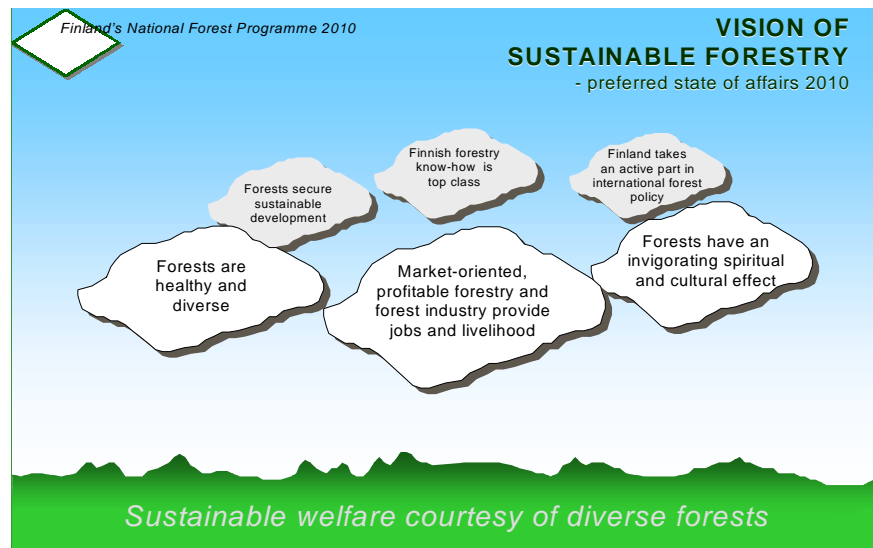
For the implementation of the National Forest Programme a Forest Committee elected on a broad base will be formed. It will have subordinate ad-hoc work groups. The follow-up and development of the Regional Forest Programmes along the lines of the National Forest Programme will also be the responsibility of the Committee. The implementation and follow-up is carried out in the same spirit of public participation and co-operation as when the programme was made.

STARTING POINTS

Vision: Sustainable welfare courtesy of diverse forests

Sustainable forest management must have its goals set several decades, even a century, or more, ahead. Short-range targets have to be accommodated to long-term goals. The vision of a sustainable forest management and protection - *the preferred state of affairs in 2010* - can be expressed in the following words based on the work of the Regional Forest Programmes, the working groups of the National Forest Programme and the various public forums:

The forests secure sustainable development.
In terms of being a renewable raw material, forests provide a natural and excellent foundation for a sustainable development process of the economical, ecological and social conditions in Finland. Forests and wood products are also important as they bind and store carbon, which slows down the greenhouse effect. Public and open exposure together with ethically high-level actions form the hallmark of Finland's forest policy.



The forests are healthy and diverse.

Commercial forests are managed and used so that they will retain their healthy growth and diversity. This secures sustainable forest production along with all the other benefits the forests can offer. The representativeness of conservation areas have been charted to form the basis for a Forest Conservation Programme for southern Finland in which economic and social aspects have been integrated. This programme has already reached quite an advanced stage of implementation.

A market-oriented, profitable forestry and forest industry provide jobs and livelihood.

Competitive forest cluster, particularly as seen from the wood products industry's and small and medium-size enterprises' (SME) point of view, will gain more wide-spread significance and there will be more wood used for energy production. The forest sector acts according to the market demands, and consumers in Finland and abroad trust Finland's ability to manage forests in a sustainable manner. Forestry in Finland, and family forestry in particular, will remain profitable and together with other small enterprises will provide rural livelihood. The volume and the quality of wood production will be high and silviculture corresponds to the needs of sustainable use of wood.

Forests have an invigorating spiritual and cultural effect.

Landscapes and cultural values are an inherent part of forestry. So are other types of forest use, such as hunting, reindeer husbandry and tourism. Finland's "Every Man's Right" gives everybody

the opportunity to enjoy the forests in terms of recreation from trekking to picking wild berries and mushrooms.

Finnish forestry know-how is top class.

The information contents in all forestry products will increase. Forest education, research and the development of products and services is on a high level. Education and research co-operate in networks with enterprises, which produce new information-intensive and competitive products and services. High-level know-how on sustainable forest management is, also, an export product.

Finland takes an active part in international forest policy.

Finland plays an active role in the development of sustainable forestry globally, in Europe and in its neighbouring countries. The co-ordination of the European Union's forest affairs has improved, and in line with the principle of subsidiarity, there will be a concentrated effort to develop the European forest cluster.

Background and purpose of the Forest Programme

The aim of the National Forest Programme is to meet the domestic and international requirements in order to develop forest management and protection along such lines that the forests will provide the Finns with as much work and sources of livelihood as possible, remain healthy, vital and diverse and provide spiritual and physical recreation for the Finnish people.

Ever since the 1960s several forest programmes have been prepared in Finland to advance forest management and forest benefits. Apart from the parties representing the forest sector, various ministries, the Financial Council and the Bank of Finland have taken part in the preparatory work of these programmes. The Mera programmes of the 1960s and 1970s were major landmark as they encouraged the Government and forest owners to double their investments in forest management and forest improvement. As a result of these programmes, which were concentrated in wood production, the forests grew better and the opportunities for harvesting expanded. Consequently Finland saw a rise in its forest based economy. The latest in this series was Forest 2000 - programme, which began in 1985 and was amended in 1992.

The framework of forest policy has expanded in the 1990s to become much more of an international issue. At the UN Conference on Environment and Development in Rio de Janeiro in 1992, and at various meetings since then, new principles for an ecologically, economically and socially sustainable forestry have been agreed on. At the so-called Helsinki Process, the European Ministers of Forestry attuned the principles sustainable forestry to the prevailing circumstances in Europe. In all these connections the importance of national forest programmes has been stressed as a prerequisite for a sustainable forestry. By now, almost every European country has developed its legislation, organisations and regulations to conform with the new expanded principle of sustainability.

The globalisation of the forest industry and Finland's membership in the European Union have increased the importance of international thinking. The certification of forests may also, when fully realised, have effects on the forest policies of Finland and many other countries. It is also important to Finland how the forest economies in Russia and the other neighbouring countries develop.

From an international perspective the most important aim of a forest programme is to secure the sustainability of forestry. At the Rio Conference the main focus was on the biodiversity and ecological sustainability. During the European ministerial conferences a trend towards a greater emphasis on economic and social sustainability has emerged, which reflects the situation in Finland, also.

In Finland the forest legislation and the Nature Conservation Act have been reformed in the 1990s. The new Forest Act of 1997 regulates the logging and obliges owners to take care of reforestation after final felling. The Forest Act addresses particularly important habitats, such as immediate surroundings of brooks and small lakes and certain nutrient-rich mires, which have to be preserved in order to protect rare species. Through the Sustainable Forestry Financing Act (1997) the Government supports the sustainable wood production and the ecosystem management. According to the Nature Conservation Act (1997) the biodiversity will be protected by means of Conservation Programmes, the creation of protected areas and protection schemes for special types of nature and living organisms.

New environmental principles were ratified in 1994 with the Environmental Programme for Forestry jointly produced by the Ministry of Agriculture and Forestry and the Ministry of the Environment. With this programme as a basis, the various forestry organisations and forest industry companies have reformed their forest management instructions and recommendations. For the implementation of the ratified Conservation Programmes for privately owned land during the period of 1996 - 2007 a sum of EUR 600 million has been reserved in a financing scheme, EUR 200 million of which will be used for the protection of forests. The proceeds from land exchanges and sell-offs conducted by the Finnish Forest and Park Service will generate EUR 200 million towards the financing scheme. Furthermore, state forests utilised commercially have been transferred to protection in the 1990s representing a value of approx. EUR 250 million.

Many of the tools formerly available for forest policy, such as forest taxation, state subsidies and stumpage price bargaining, have lost their relative importance during the 1990s. The amount of silvicultural works and first thinnings has dropped, resulting in a lower value for future forests.

The fundamental angle of approach for the National Forest Programme is market orientation. The export markets of forest products provide Finland with a flow of income, which secures the means for developing a sustainable forest economy. A profitable and competitive forest cluster creates the prerequisites for preserving biodiversity and social and cultural values.

The forests are still of very great importance for the welfare of the Finnish people and for the economic development of the country. The products from the forest industry count for over a quarter of export earnings. The whole *forest cluster*¹, which apart from the forest industry, incorporates the paper, pulp and forest machinery industry, parts of the chemical industry and a number of consulting firms, generates 30 - 35 per cent of the country's total export earnings. The forest is still, along with the metal and electronics industries, one of the three supporting legs on which the Finnish economy stands and on which the welfare for decades to come can be built. The forests are the most important part of Finnish nature and a fundamental base in the way of life and the culture of the Finnish people.

¹ **Forest cluster** is defined as an entity of forestry, forest and wood products industries, machine and equipment manufacturing, production of chemicals for the forest industry, automation, packaging, graphics industry, energy utilities, logistics and consulting enterprises together with associated training and research. Other clusters vital for Finland's competitiveness include telecommunications, basic metals, transport and energy.

Creating and supporting employment and developing business ventures and rural districts have emerged as more and more important goals for society as rural depopulation has accelerated. In forestry, as is generally speaking the case in all types of basic production, the number of job opportunities has dropped, but by increasing the use of wood, making forest management more efficient and raising the value-added of wood products, the downward trend in jobs can be slowed down. Rural employment opportunities are becoming more and more important for the forest sector as, without a functioning countryside, forestry and timber harvesting will soon face a shortage in labour. A road network in good working order is another prerequisite for the countryside and all forestry.

The urbanisation of society affects people's relationship with forests and forestry. It is important, however, that the great number of opportunities offered by the forests are known to the various levels of society, from ordinary people to decision-makers. A dialogue between the forest sector and all groups of people is becoming more and more integral to a successful forest policy.

The National Forest Programme is a new tool of forest policy. In comparison with previous forest programmes, it has an international background and the drafting process has been accessible, apart from experts, to a large number of interest groups and private citizens. Another new angle is that the National Forest Programme can gain support from the Regional Forest Programmes which, for the first time, have been compiled in accordance with the Forest Act of 1997.

There are many policies that have an influence on forests. These encompass the policies of industry, labour, land utilisation, traffic, energy, competition, rural development, training, social affairs and the environment. The timeframe for drafting the National Forest Programme did not allow for any opportunity to work out detailed suggestions of action for the various ministries involved. Suggestions containing general guidelines will be the subject of more detailed preparation as soon as the Forest Programme gets off to a start in collaboration with the ministries most closely involved.

The National Forest Programme has been drafted in accordance with the guidelines presented in the reports and programmes by the Government and various ministries. Fundamental documents include:

- The Government's reports on the outlook for the future (1996 and 1997)
- The Government's report on business and trade policy (1996)
- The Government's report on energy policy (1997) and its follow-up report (1998)
- The Government's programme for sustainable development (1998)
- The Government's resolve in principle on targets up until the year 2005 regarding water protection (1998)
- The Ministry of Agriculture and Forestry's and the Ministry of the Environment's environmental programme for forestry (1994) and its follow-up reports
- The Ministry of Agriculture and Forestry's strategy for natural resources (1997)
- The Ministry of Agriculture and Forestry's criteria and indicators for sustainable forestry (1997)
- The Ministry of the Environment's national programme of action for 1997 - 2005 concerning Finland's biodiversity (1997)
- The Ministry of the Environment's instructions regarding the environmental impact assessment of plans and programmes (1998)
- The Ministry of Transport and Communication's maintenance and development programme over the period of 2000 - 2003 for the road network (1998).

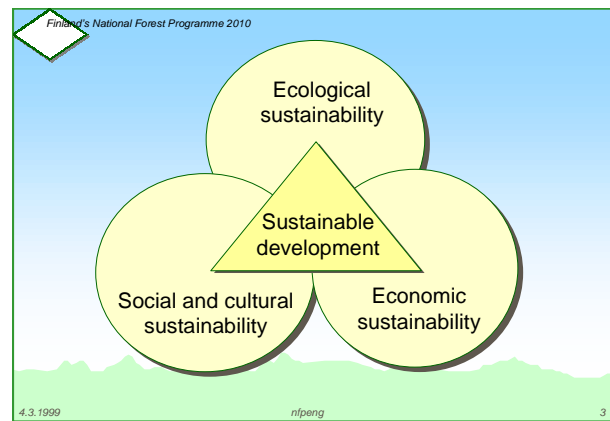
PROGRAMME

The forest cluster supports sustainable development

Being a renewable natural resource the forests in tandem with a competitive forest cluster will offer a solid basis for sustainable development.

In 1998 the Government sanctioned a programme for a sustainable development. Simultaneously it served as the Government's resolve in principle (VNp 4.6.1998) for furthering ecological sustainability. The aim of the programme is to achieve ecological sustainability and the economic, social and cultural conditions, which form the vital prerequisites for success.

The primary aim of *ecological sustainability* is to reduce the utilisation of non-renewable natural resources, to preserve nature's own productivity and its values and to improve the state of the environment. The goal of *economic sustainability* is to improve the competitiveness of the national economy and to improve the employment. At the same time production and consumption will be changed to cause less strain on the environment. The goal of *social and cultural sustainability* is to become better prepared with greater knowledge and skills to meet the challenges of sustainable development and to secure the welfare of the people. *Sustainable development* is defined as being a state of affairs that satisfies the demands of the present while maintaining the potential to meet the needs of future generations.



The greatest challenges to a sustainable ecosystem are problems such as how to retard climatic change, maintain the rich diversity of species and establish a sustainable exploitation rate of natural resources. Judged by international standards the environmental situation in Finland is relatively good in most respects.

Economic sustainability is defined as a balanced growth in terms of substance and quality which is not based on long-term indebtedness or on wasting one's reserves. In a sustainable economy the aggregate effects caused by production and consumption covering the whole life span of products are incorporated into the prices in order to force a change towards sustainable development. A sustainable economy is more and more based on human resources: on education, research and development work and the innovations and the know-how these generate. The efficient and economical utilisation of resources and advanced technology are becoming increasingly important.

In Finland the greatest challenges to achieving a social sustainability come from unemployment and social exclusion, increasing social disparities and a weakening rural population base and basic rural structure.

The various sections of Finland's strongest know-how concentration - the forest cluster - support each other to make the products highly qualitative and competitive. The demand for forest industry products is growing world-wide and provides good prospects for a further development

of the production sector (page 11). The forest resources allow the industry possibilities to increase domestic timber exploitation by 5 - 10 million cubic metres (page 13), in addition to which the degree of processing is planned to be increased in the wood products industry in particular. The industry's production processes are developed continuously in order to save the environment, raw materials and energy. The plan is to increase the use of wood for energy production by 5 million cubic metres by the year 2010 (page 13).

Therefore, in order to meet the increasing utilisation of wood, the forests will be managed accordingly to ensure that the growth rate and volume of the stands will continue to improve (page 19). In support of sustainable development, the forest clusters' high level of intrinsic expertise will be developed in many directions, i.e. by establishing a new Innovation Forum for the whole forest sector (page 24).

The National Forest Programme meets the challenges of ecological sustainability. Sustainable wood production and consumption slows down the greenhouse effect and follows the basic principles for sustainable utilisation of natural resources. The biological diversity will be secured by ecosystem management of commercial forests, by implementing ratified Conservation Programmes and, in particular, by developing the conservation of forests in southern Finland (page 17). The environmental impacts of forestry will remain under observation and the methods of forestry will be improved in accordance with new feedback information (page 29).

The National Forest Programme supports social sustainability by strengthening the conditions for family forestry, by slowing down the drop in rural employment and by supporting the creation of new occupations within value-added wood products, other SMEs and energy production (page 13).

Social and cultural sustainability is supported by co-ordinating forestry with the traditional forms of forest use, i.e. hunting, berry and mushroom picking, recreation and reindeer husbandry. The so-called "Every Man's Right," which allows the citizens equal opportunities to enjoy the forests, will be preserved (page 22).

Publicly transparent, ethically high level approach is followed in forest policy. The National Forest Programme has been drafted along these principles (page 28) and the same principles of public-spirited co-operation will be followed during the implementation and follow-up process (page 33). The still to be elected Forest Committee and its subordinate ad-hoc work groups, which will carry out the implementation and supervision of the programme, will provide a more stable ground for an interactive and sustainable forestry than we have seen before.

Good prospects for the forest industry to grow

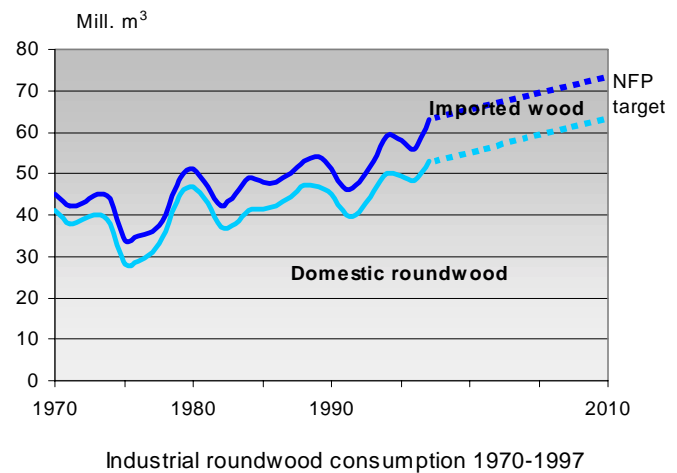
The aim of the National Forest Programme is to preserve competitive conditions for the forest industry in Finland and make it possible for the industry to increase its domestic consumption of wood by 5 - 10 million cubic metres by the year 2010.

Another goal of the Forest Programme is to double export earnings generated by wood products by the year 2010.

The forest industry has expanded and become a global operation. According to the FAO and other forecasts, the consumption of wood and paper products will show an annual growth of 1 - 4 per cent over the next period of years. The growing demand creates the opportunity to expand the production of the forest industry even in Finland. During the 1990s the forest industry's annual use of domestic roundwood has increased from 45 million to 55 million cubic metres. On top of that imported timber has amounted to almost 10 million cubic metres.

Repair and renewal investments planned for present mills would increase the wood consumption at an average rate similar to that of domestic roundwood during the 1980s and 1990s.

The parties involved in the timber trade must continuously develop the *timber trade procedure* to the extent that it serves both buyers and sellers on an equal basis. A reliable and continuous supply of timber from the forests to the mills becomes more and more critical the closer the annual harvesting approaches the allowable cut. In Finland where family forestry is dominant, it is important that, apart from the parties directly involved in the timber trade, the forest owners can receive up to date and neutral market information from various advisory and research organisations.



The forest industry is the single biggest transporter of goods in Finland. Its share of all transports is approx. 30 per cent by road, over 50 per cent by rail, over 80 per cent by inland waterways and 65 per cent by sea. A great emphasis is placed on the development of the *traffic infrastructure* from the forest industry's point of view, in particular on the development and maintenance of the lower standard road network and forest roads. Besides, the low standard road network and forest roads are vital for silviculture, logging, multiple use of forests and rural society as a whole.

The forest industry consumes one third of the total consumption of *electricity* in Finland. The total consumption of electricity is calculated to grow from 74 TWh (1997) to approx. 88 TWh by the year 2010. Simultaneously the consumption by the forest industry will grow from 25 TWh to 31 TWh, assuming that its wood consumption grows by 10 million cubic metres and the structural pattern will remain unchanged from the present. In addition to the expansion in capacity, the forest industry's energy consumption will grow because of protection of the environment and by new value-added transformation processes. At the same time, new technologies are developed in order to improve energy conservation. A sufficient and guaranteed supply of electrical power at a competitive price is an important strategic issue for the forest industry.

In the 1990s the total *workforce employed by the forest industry* has dropped from 92,000 to 72,000 employees. This downward trend has now slowed down and a similar dramatic drop is not expected in the future. The Workforce 2017 programme has estimated that the forest industry's workforce will amount to 60,000 working years in the year 2010. Substantially more people with university degrees will be required to work with studies of the wood products industry and its product development, marketing and business development. Even the developing SME-sector will need more employees.

The paper industry is competitive and predominantly based on highly advanced Finnish know-how. Paper is an extensively developed product with a high value-added. The utilisation of different wood fibres requires more development. Even though the technology of the wood products industry is at a high level, the value-added share of its exports has not risen as fast. The export earnings of the wood products industry was EUR 2.5 billion in 1997 of which one fifth was represented by carpentry, furniture and prefabricated wooden houses with a high value added.

Increasing the value added of wood products is the single most important course by which the value of the forests can be increased in terms of national economy. The wood products industry and, in particular, today's advanced value-added production, is a high technology field which requires a well-developed business environment. Improved data and communication technologies create opportunities for new business practices and organisation systems. The development of market oriented products, production processes and business practices is an undeniable part of competition.

The business and networking of the SMEs are supported by the "Time for Wood" -campaign and its action programme "Wood Finland", and also by developing forest and wood Centres for Excellence and by technology, marketing and networking programmes. Technology programmes for wood boards and mechanical wood processing have already been implemented. Technology programmes for building with wood and doubling the value added of wood products are under way, and the year 1999 will see the introduction of a new technology programme for making furniture. Finland's participation in EMU has reduced the exchange rate risks, which will have a positive effect on the export prospects for SMEs in particular.

Wood and paper are recognised as ecologically friendly materials. There is at present concern in the markets, however, about the sustainability of the utilisation of forest resources. This fact may well result in competing materials gaining favour over wood. The acceptance of the use of wood and the use of forests must be secured by forestry measures (Ecological sustainability is secured, page 17) and by communication measures (International forest policy, page 26).

The *certification of forests* appears to be an important factor concerning competition on the export markets for wood and paper products. The National Forest Programme supports potential certification projects by strengthening follow-up systems for forestry (page 21) and by further developing the sustainability of forestry.

Forestry is profitable and creates employment

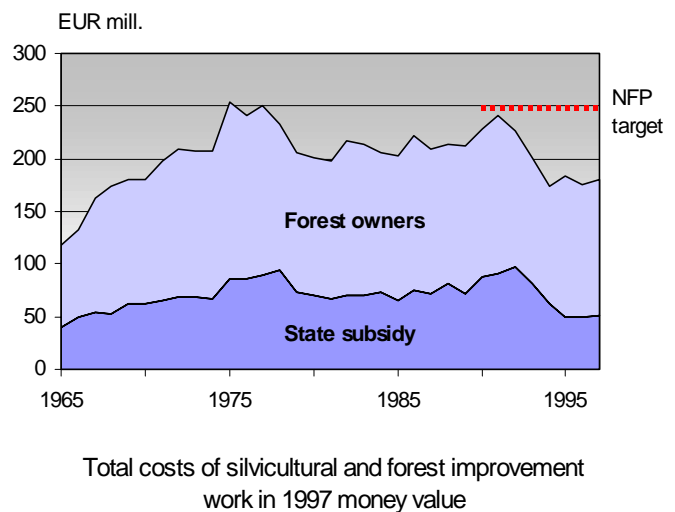
The goal of the National Forest Programme is to increase the annual harvesting of industrial roundwood to between 63 and 68 million cubic metres by the year 2010 in such a way that the high level of silviculture and ecosystem management are sustained.

Another goal is to increase the use of wood for energy by 5 million cubic metres per year.

The forests are of vital importance in terms of promoting the welfare of Finland as a whole and its countryside in particular. The forest industry has given wood a solid value, which has justified investments, in work and money, in forest management, which in turn has resulted in a continuous growth in volume and value of wood production. Due to the growth in forest produce, the forest

industry has been able to expand its capacity. Consequently, the interaction between forestry and the forest industry has generated a positive effect of mutual benefit throughout the 1990s.

Total investments in silviculture and forest improvement reached their peak in the mid 1970s. Expressed in 1997 currency, the annual sums averaged EUR 250 million of which the forest owners paid two thirds. The Government paid one third in subsidies and loans. In the 1990s forestry investments dropped to EUR 170 million per year and, simultaneously, the share of Government subsidy dropped to 27 per cent. In the State budget for 1999 EUR 49 million has been reserved for subsidies and EUR 0.3 million for loans.



As a result of silvicultural investments the annual increment and the allowable cut have increased. During the 1990s the forest industry has expanded its use of domestic roundwood from 45 million to 55 million cubic metres per year. At the same time its annual export earnings have grown by EUR 1.7 billion.

According to the so called Mela -calculations of alternatives carried out by the Finnish Forest Research Institute (page 34), the gradual increase in the volume of the production of industrial *roundwood*² set to reach 70 million cubic metres by the year 2010 should stabilise the volume of the growing stock at the current level. By that time the annual increment will increase from its present figure of 75 million to approx. 77 million cubic metres and by 2030 it should reach 90 million cubic metres.

A production of 50 million and 60 million cubic metres of industrial roundwood would still result in a continuous increase in the volume and growth of the growing stock during the next 30 - 40 year period. According to forest management recommendations, a roundwood production of even 80 million cubic metres per year would be sustainable for the next 20 years but after that the harvesting potential would have to drop to a level of approx. 65 million cubic metres. To begin with, this second alternative would reduce the volume and growth of the growing stock, but by the time the stock had grown older we would see an upward trend in volume and growth once again.

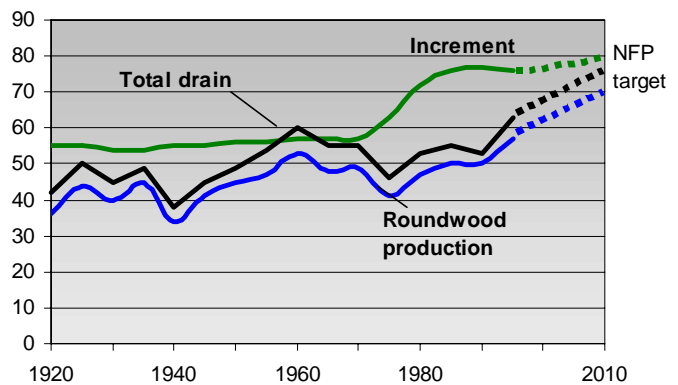
The Mela calculations of alternatives show that logging can be increased in line with the forecast demands of the product markets and the predicted expansion of the forest industry's capacity up until the year 2010 without endangering the principle of sustainability. The structure of roundwood production, however, requires a change to include a larger proportion of pine pulpwood and harvesting on peat lands. The allowable cut for spruce will drop in 20 - 30 years time (Chances for the programme to succeed, page 29).

The National Forest Programme's target of reaching a production of industrial roundwood of 63 - 68 million cubic metres in 2010 is yet to be approved pending the detailed environmental impact

² **Roundwood production** is defined as the volume of roundwood harvested and hauled from the forest for various forms of end use. In addition to industrial roundwood, which exceeds the minimum stem diameters set by the forest industry, an extra approx. 2 - 3 million cubic metres of roundwood below the standard are felled for use as firewood. **Harvesting drain** (the logging volume) includes, besides roundwood production, the stripped off crowns left to decay in the forests. **Total drain** is defined as harvesting drain added by natural reduction.

assessment, which will take place at the initial stages of the programme. Simultaneously the economic and social effects will be evaluated (The EIA committee of experts, page 33). This will ensure that the programme leads to improvements in biological diversity.

The roundwood production calculation results by Mela are based on the forest management recommendations, which have not, however, been completely followed in the last few years. Reforestation, tending of seedling stands, ditch cleaning and first thinnings have failed to complete the entire scale of the recommendations. An increase in roundwood production demands a complete implementation of the forest management recommendations, and the investments in silviculture and forest improvement must be returned to their former level of approx. EUR 250 million.



Increment, roundwood production and total drain 1920-1997.

Several decades of experience prove that the socially important family forestry works well provided that advisory and training services and support for least profitable activities are available. In order to fulfil this part of the programme the *Government's subsidy for silviculture and forest improvement* will be increased by EUR 10 million and for *planning, training and advisory services* by EUR 9 million per year (Appendix 2, page 35). With this support, the forest owners will increase their own input by approx. EUR 65 million.

The sustainability of private forestry is subsidised in all countries, which have a large proportion of private forest ownership. The justification for subsidising investments, which are least profitable for private economies and may need to span over generations, and joint-investments which are difficult to organise without support, is the great return these subsidies bring in benefits to society as a whole.

In order to render reforestation and the silviculture of young stands more effective, the feasibility for a possible revision of *forest taxation* to the effect that silvicultural expenses could be tax deductible is currently under scrutiny.

The *profitability of forestry* has improved during the second half of the 1990s due to an increased amount of harvesting. During the period of 1970 -1997 the average real net profit per hectare was EUR 77 whereas in 1997 and 1998 it amounted to EUR 98. Increasing the production for industrial roundwood to 63 - 68 million cubic metres would produce a rise in stumpage price earnings by a total of approx. EUR 100 - 250 million which would equal an average net profit of EUR 103 - 104 per hectare. Consequently, the higher degree of effective utilisation of the forests combined with a higher work efficiency will generate greater profitability for forestry which, in turn, will encourage forest owners to take greater care of their forest management and all the other benefits of their forests.

During the 1990s the *workforce employed in forestry* has dropped from 39,000 to 23,000 people. According to the Workforce 2017 committee, the downward trend will slow down so that by the year 2010 there will still be 20,000 persons engaged in forestry. The increased harvesting of commercial roundwood and wood for energy in combination with the expanded amount of

silvicultural works stipulated in the National Forest Programme will slow down the downward trend of the workforce by 3,000 - 5,000 working years. The effect in the forest sector, forestry and the forest industry combined, will be 10,000 - 15,000 working years. From the perspective of Finland's whole national economy the effect of the programme on employment represents 35,000 - 45,000 working years (page xx).

In the case of forestry, preparatory steps must be taken to adjust to a situation in which there will be a shortage of skilled labour because of unfavourable rural development. Therefore, special consideration must be given to issues, such as workforce supply, training and welfare, and forestry workers' jobs must be made as secure as possible. Intensified research is needed to make the methods applied in silviculture less labour intensive and to develop a higher degree of mechanisation in silvicultural works. Even harvesting is now being threatened by a shortage of skilled labour. The resources for training forest machine operators are sufficient but a large proportion of the trainees change their field in the middle of their studies with the result that the schools cannot produce a sufficient number of skilled operators. Both employers and the whole forest sector will have to elevate the status of forest machine operators in order to solve this problem.

The downward trend of the rural population cannot be changed by the forest economy alone. Such a change requires the co-operative assistance of all the other forms of rural development schemes. *Small size business activities* support the countryside and forest utilisation in many ways. Measures, such as upgrading the level of value-added in the wood products industry, developing the SMEs and the use of wood for energy production can potentially bring thousands of jobs to the countryside. Moreover, management of conservation areas, nature tourism and other forms of multiple-use ventures will all contribute to a better employment situation. The development of the general business climate for the forest machinery and transport enterprises and other small enterprises is an important part of the National Forest Programme.

One of the aims of the National Forest Programme is to increase the annual use of wood for energy production by 5 million cubic metres by the year 2010. By international standards Finland produces quite a lot of its energy from wood; almost 20 per cent of the total. Four fifths of the quantity is produced within the industry by burning black liquor from the pulp mills and bark, sawdust and chips, which are by-products from the wood industry. The rest consists of firewood, building and demolition waste and logging chips, which is burnt in homes and small size district heating plants. Only 0.8 million cubic metres of logging chips is used today, but the capacity available would allow for 10 million cubic metres per year. Currently, the annual total use of solid wood fuel amounts to 13 - 15 million cubic metres. Investments in new plants will create the potential for increasing this amount by 4.5 to 5.5 million cubic metres by the year 2010. The bulk of this increase will come from logging chips. The target of the National Forest Programme is to increase the use of solid wood fuels by approx. a third. The technology is already available and energy taxation in Finland has also been revised to make energy based on wood more competitive. Small enterprises which produce wood based energy will need financial support for their investments during the initial stages.

The aim of the National Forest Programme is to make the forest economy more effective by supporting *competition*. Because of the great number of private forest owners a special bargaining procedure is, however, necessary to create the foundation for a stable and unhindered timber trade. Public market and price statistics and electronical timber market places would advance the operation of the market. The possibilities of enabling the small enterprises to buy special logs of high value so as to match their value-added production must be supported. The delivery sales must be developed along such lines so that in the future it will serve the demands of both seller and

buyer more efficiently than it does today. Other services linked with forestry must also be developed so as to become more efficient and co-operative networks. These services include silviculture management, planning, harvesting, haulage and transportation.

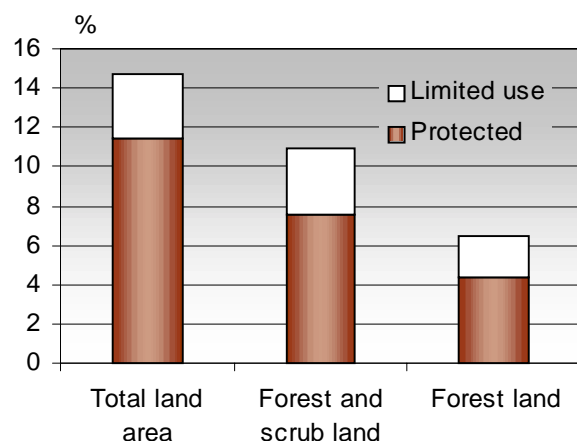
The resources for *advisory services and training for the forest owners* will be doubled (page 37), so that the continually changing group of forest owners can be given sufficient information about the importance and opportunities of their forests. The general trend in population towards becoming more and more urbanised and older applies to forest owners too. Half of the private forests are owned by non-farmer forest owners and a quarter by the estates of deceased persons and consortia of private persons. Every year sees some 10,000 new private forest owners as a result of a new generation taking over. Possibilities for putting advisory services and training out to tender will be considered. Moreover, new forms of joint ownership have to be developed which can satisfactorily serve both forest owners and a sustainable forestry.

One target is to increase the number of *individual forest plans* to 75 per cent of the total area of privately owned forests. Currently the proportion is about 50 per cent. In order to obtain the basic material for this planning the Regional Forest Centres are building up a forest database in connection with the regional forest planning. During the 1990s the area of regional planning has dropped from covering 1.4 million to 0.6 million hectares per year. In order to achieve the target set for individual forest planning, regional planning has to be increased to cover one million hectares per year. Additional Government support has been reserved for this purpose (page 37). The database will be used in the individual forest planning, which will be performed by specialists selected by the forest owner. Data about the forest stands will be handed over to the forest owner free of charge except for delivery charges. The forest owner is therefore personally in charge of the compilation of the plan for his own estate and for all extra costs caused by his possible extra requests. In comparison with the present situation the development of forest planning will require a closer co-operation between the Regional Forest Centres and the Forest Management Associations.

The *Regional Forest Programmes* form the basis for the development of the forest economy in the regions of the Forest Centres. Regional programmes are the foundation on which the National Forest Programme is built and these will be developed in harmony with the implementation and follow-up of the National Forest Programme. The regional programmes will be reviewed by the end of the year 2000 and adjusted in accordance with the guidelines of the National Forest Programme. The *Finnish Forest and Park Service's Nature Resource Plans* provide the guidelines for sustainable forestry in state owned forests.

Ecological sustainability will be secured

The aim of the National Forest Programme is to achieve and preserve a favourable standard of conservation of species and habitats in the forests by a combination of conservation areas and ecosystem management in the commercial forests.



Protected and limited use areas as per cent of the total land area and of the forests in 1998

A total of 11.4 per cent of *Finland's land area* is protected. 7.6 per cent of the forests (forest land and scrub land³) are protected (1.7 million hectares) to which one can add 3.0 per cent which is classified for limited utilisation. Of all *forest land* 4.4 per cent is protected and 2.1 per cent is for limited utilisation. Of the protected forest land 3.5 percentage units are protected by legislation or by decisions issued by the Finnish Forest and Park Service or the Finnish Forest Research Institute. 0.9 percentage units belong to ratified Conservation Programmes, natural parts of wilderness areas and forests of collectivities outside commercial use.

The protected areas are concentrated in northern Finland. South of the province of Oulu only one per cent of the forest area is protected and another one per cent is represented by forests for limited utilisation.

In comparison with the other Nordic countries, Finland is on the same level as Sweden. Both countries have approx. 3.5 per cent of their forest land protected by legislation. In Norway the equivalent figure is 0.9 percent and in Denmark 1.1 per cent. The Swedish Government has decided on a target to expand their protected area of forest land by another 250,000 hectares within the next 10 years, which means that their percentage of protected forest land will reach a total of 4.8 per cent. Money reserved for this purpose has been included in the budgets for 1999 - 2001.

The sustainability of forest ecosystems rests on protected areas and the management of commercial forests. There has been a regression of some forest species and, consequently, more attention has been paid to preserve biodiversity in commercial forests since the 1970s. In the 1990s biodiversity has received more detailed attention in the environmental instructions and recommendations for forestry and also in the new Forest Act. The schemes for improving a sustainable ecosystem in the forests have been based on the Environmental Programme for Forestry (1994) compiled jointly by the Ministry of Agriculture and Forestry and the Ministry of the Environment. Its follow-up report (1998) includes a description of ecosystem management activities in 1994 - 1997, the situation in 1998, an assessment of actions needed during the next few years and, finally, a defined target situation for sustainable forestry by the year 2005. The Environmental Programme for Forestry will constitute the base on which all improvement schemes concerning the ecological sustainability will be carried out within the framework of the National Forest Programme.

The development work of *forest conservation in southern Finland* will be strengthened by appointing a large committee of experts (page 33). Apart from ecological considerations, the economical and social aspects of forest utilisation will be considered while evaluating the needs of development. These needs will be assessed on the basis of estimates and research concerning the level of representativeness of the southern and central boreal forest conservation areas; a project which is still in process. Over the next few years this charting will serve as background material for the compilation of a target, financing and action programme for the conservation of forests in southern Finland, the western parts of the province of Oulu and the south-western regions of Lapland. The programme will be implemented as soon as it becomes ready. New methods for realising and financing the conservation schemes are under investigation.

³ **Forest land** is capable of producing volume increment of 1.0 cubic metre per year per hectare or more. **Scrub land** normally consists of stony soils or marshland where the annual increment stays below 1.0 but is above 0.1 cubic metre per hectare.

Protection will be intensified regarding valuable habitats under the Nature Conservation Act, and more budget money will be reserved for the management of nature conservation areas, especially allocated for restoration and other ecosystem management activities.

Conceptual definitions of forests and conservation will be brought into accord and conservation statistics will be developed in accordance with the suggestions of the Protected areas project group in 1998.

The Forest Act and the Nature Conservation Act have created a good framework for the *biodiversity in commercial forests*. In order to secure biodiversity, the most important measures shall incorporate issues, such as continuous, research-based improvement of environmental recommendations for forestry, joint development by the forest and environmental administrations of an ecosystem management monitoring system and, finally, attention to biodiversity in all forest planning. The fragmentation of the private non-industrial forests in southern Finland has a positive effect on biodiversity. Budget money reserved for ecosystem management will be increased (page 35) and the flexibility of regulations will be developed. Economic losses for private forest owners caused by the preservation of important habitats, such as dwelling areas for the flying squirrel, will be compensated for. Parts of this budget will also be reserved for the inventory of the specially important habitats listed in the Forest Act, and for financing large-scale ecosystem management activities.

Since its inception in the 1980s the *European monitoring regarding the forests' vitality and health* has given vital information about the health of European forests. The monitoring will continue and primarily concentrate on the effects of various stress factors. Only sufficiently long time-series data will give reliable answers regarding the consequences of the stress loads placed on forests.

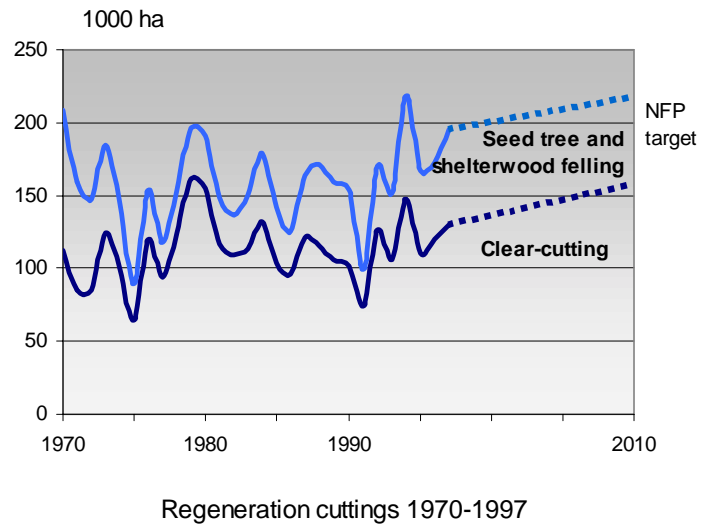
The *environmental load caused by forestry* will be reduced in accordance with the Government's resolve in principle of 19 March 1998 regarding water protection. The effect of ditch cleaning and supplementary drainage on waters will be reduced by the introduction of more efficient methods. Protection zones will be left around clear-cut areas in order to reduce the phosphoric and nitrogenous loads on water systems to half of the 1993 level by the year 2005. Detailed water protection measures will be defined in the new forest management recommendations to be issued in 1999.

In respect of *climate change* the European and Finnish forests have acted as carbon sinks as they have bound more carbon than they have released. As a result of the implementation of the National Forest Programme, the volume of the growing stock will increase further and the forests will remain healthy and vigorous, which will keep the carbon balance positive. Afforestation of fields and peatland grounds add to the carbon sink. The Forest Programme supports the use of wood products and firewood, which slows down the increasing content of carbon dioxide in the atmosphere when substituting for products made of non-renewable raw-materials and fossil fuels.

The forests will be well managed

The aim of the National Forest Programme is to take care of silviculture and forest improvement work to the effect that the production of industrial roundwood, which will rise to 63 - 68 million cubic metres per year, will stand on a sustainable base.

According to the Mela calculations (page xx) the increase in harvesting to a volume of 63 - 68 million cubic metres per year will gradually increase the area subjected to clear-cutting from its present annual level of 130,000 hectares to 135,000 - 150,000 hectares within the next decade. After the increase over this period, clear-cut areas will drop back to an annual level of 120,000 - 130,000 hectares. *Seed tree and shelterwood fellings* will be kept at the present level of approx. 60,000 hectares per year.



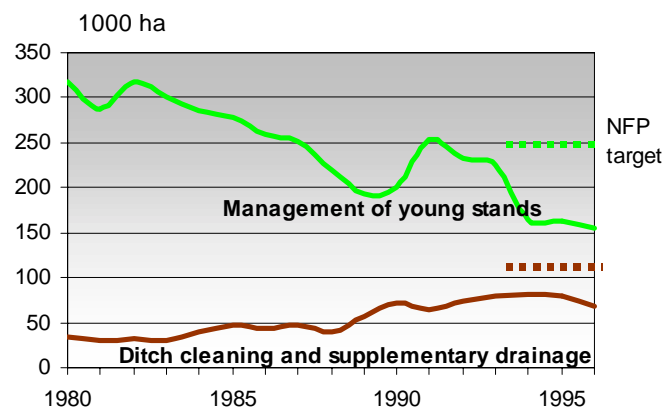
Forest planning and advisory services will be used to make forest owners select regeneration cutting sites which will have the most positive effect on the future development of forest stands. Areas belonging to this group include, in particular, the spruce forests of southern Finland at end of their revolution, and the low yield forests of northern Finland.

Summer harvesting will be limited to the least possible amount because of *Annosus* root-rot fungus and, furthermore, to areas where the risk of damage is minimal. In the period between May and November stumps should be treated with biological fungicide to prevent root-rot from spreading. The nesting season for birds is another reason why summer harvesting should be avoided within economically feasible limits. An ad-hoc work group will be formed to investigate the effects of summer harvesting.

During the 1990s the results of *reforestation* have not lived up to the goals set down in the forest management recommendations. For every one out of five reforestation areas, there is evidence of a lag according to assessments made by the Forest Centres. If reforestation continues at the same rate, the sustainable roundwood production will drop by 2 - 6 million cubic metres a year. In the 1990s the share of *natural regeneration* has grown from 24 to 32 per cent. The advantage of this method is, of course, reduced costs for reforestation, but the disadvantages are a longer rotation period and a greater risk of failure. To reduce the risk, the application of natural regeneration will be directed at forest stands where the probability for success appears to be good. The amount of natural regeneration will be kept at its present level.

Groups of trees and decayed trees will be left intact on reforestation areas in order to preserve the landscape and biodiversity. The method will be developed further to ensure that benefits are maximised and financial disadvantages are minimised. In order to increase the number of decayed trees, trees and windfalls will be left untouched for the duration of the forest's complete rotation cycle.

The amount of work involving the *management of young stands* has dropped from 250,000 hectares to 150,000 hectares per year. The area of young stands lagging behind in relation to the recommendations covers approx. 460,000 hectares. Proper



management of young stands increases the share of valuable tree species, accelerates growth, diminishes the risks for damage, increases the volume of usable roundwood and improves the profitability of first thinning. A sustainable forestry as defined by the National Forest Programme, prescribes a return to the previous area of young stand management, i.e. 250,000 hectares per year. During 1998 - 2002 this target will be met with the aid of the Young Stand Management campaign. Later on, young forests will be kept in order by way of intensive promotion and an increase in the harvesting of energy wood. Coniferous young stands should have a mix of 5 - 30 per cent of deciduous saplings. It is recommended that most fertile stands, in particular, should contain a large proportion of deciduous trees. When improving young stands it is advisable to concentrate the felling on pine rather than on spruce trees. According to estimates the improvement of young stands can produce an annual volume of 1.8 million cubic metres of wood for energy.

In the 1990s less than 100,000 hectares per year received *first thinnings*. First thinnings have a considerable effect on the amount of commercial timber that can be harvested profitably, the production of sawlogs, the proportions of tree species within the stand and for subsequent thinnings. In southern Finland the net return from a pine stand with proper thinning is four times bigger than without thinning. Birch stands produce 2.5 times as much and spruce stands double their produce. According to the Regional Forest Programmes, the demand for first thinnings covers 250,000 hectares per year up until the year 2010 after which the demand will drop to 200,000 hectares.

In addition to advisory services to forest owners, the increase in first thinnings will benefit from market oriented measures. Attempts to bring down the minimum diameter for first thinning trees must be made, the use of wood for energy increased and the number of products and industries using first thinning wood developed. The costs involved in first thinning vary extensively depending on how well the seedling stand has been tended earlier. Accordingly, large variations in root prices for first thinnings must be accepted. The repair and renovation investments planned by the forest industry provide the potential for doubling the volume of first thinnings by the year 2010, provided that harvesting methods and the fabrication processes for small-diameter trees from first thinnings are developed.

During the last few years *secondary thinnings* have been performed at a rate of 100,000 - 150,000 hectares per year. According to the Mela calculations, this rate has to be raised to cover approx. 200,000 hectares in order to preserve good diameter growth of trees.

About half the increase in the annual increment, i.e. 10 million cubic metres, since the 1950s has been accomplished by drainage. The drains have to be cleaned every 20 - 40 years in order to preserve good growing conditions for the trees. In the mid 1990s an average of 75,000 hectares of forest land was subjected to *ditch cleaning and supplementary drainage*. According to the Regional Forest Programmes, the annual requirement will increase to 110,000 hectares by the year 2010. The growth rate for peatland forests can be sustained at a 3 million cubic metres higher volume through proper drainage than without any reconditioning. To save money, the reconditioning work will be carried out in tandem with harvesting or other forest or ecosystem management works. Failed drainage areas will not be reconditioned. Loads on the water systems caused by reconditioning will be reduced continuously by measures following the target plan for water protection. The water balance in protected marshes and key biotopes connected with the drainage area, such as springs, brooks and nutrient-rich mires will not be disturbed. The working methods applied during drainage reconditioning will also include restoration, which favours biodiversity and water protection of peatlands.

Fertilisation accelerates the growth of trees and, in favourable conditions, can be a very profitable measure generating a 15 - 25 per cent internal rate of return. Fertilisation is one of the measures the forest owner has to decide for himself and finance by his own means. During the last few years approx. 15,000 hectares were fertilised on an annual basis. *Reconditioning fertilisation* is necessary in such marshland areas where the lack of phosphate and potash limit growth. According to the Regional Forest Programmes, fertilisation will still be carried out at a rate of approx. 15,000 hectares a year and reconditioning fertilisation at a rate of 7,000 hectares a year. This rate will increase the sustainable roundwood production by approx. 350,000 cubic metres per year. In connection with fertilisation, water protection measures will be observed.

The return of pure wood ash into the nutritional cycle of the forest is justified on ecological grounds. As the use of wood for energy is growing, methods for processing and spreading wood ash will be developed.

Round the year timber harvesting, transportation and silvicultural and improvement works require a good *network of forest roads*. The roads will also serve all other forms of forest utilisation. In the last few years approx. 3,000 kilometres of new forest roads have been built or have undergone repair. The demand for new roads is diminishing but the demand for improvement of old roads is growing. When roads are being built or improved all environmental and cultural aspects will be observed and unnecessary fragmentation of wilderness and other large forest areas will be avoided.

In the 1990s an annual aggregate area of about 8,000 hectares of fields excluded from agricultural production have undergone *afforestation*. Likewise, another 2,000 hectares per year have undergone afforestation on land left bare after peat harvesting. By 2010 fields and peatlands converted by afforestation will increase the sustainable roundwood production by more than 0.5 million cubic metres. The afforestation of fields is primarily a measure of agricultural policy where the cultural values of the landscape will be taken into account. Landscapes of particular traditional value will not be afforested.

Forest damage caused by animals or by fungi is minimal in Finland compared to most other countries. The most accountable damage and deterioration of healthy trees is caused by Annosus root-rot fungus. Summer harvesting increases the risk of root-rot, which is why thinnings of spruce stands should be avoided during the summer period and stump treatment with fungicides should be adopted. The most common noxious insect is the large pine weevil. The moose causes the greatest amount of damage for which the Government pays EUR 0.8 - 1.7 million in compensation every year. The health of forests in Finland is satisfactory and there is no immediate risk of deterioration on account of air pollution. Only the ageing of the growing stock with an accompanying growth in density would increase natural reduction, if such a condition were to continue in the long term.

There is insufficient reliable, up-to-date information available regarding the results of the various silvicultural activities. Therefore, in order to develop a *monitoring system on silviculture, ecosystem management and harvesting damage*, a joint project will be started by the forest and environment administrations. The aim is to create a cost-effective monitoring system using latest state-of-the-art technologies. At the same time, the possibility of shortening of the rotation cycle of the National Forest Inventory to five years will be considered. Feedback from monitoring results and new research will lead to adjustments of forest management instructions and recommendations.

Forests provide recreation and nature's products

The National Forest Programme ensures that traditional forms of forest utilisation and the physical and spiritual benefits that the forests offer are honoured both in the use and protection of the forests.

Forests provide the most important recreational environment for about 4 million Finns engaged in outdoor activities. About 80 per cent of the households pick wild berries or forest mushrooms. There are 300,000 hunters and 2 million people engaged in recreational fishing. There are hundreds of thousands of orienteers, scouts and nature lovers. Everybody enjoys the forest landscape. A considerable part of Finland's cultural heritage is tied to the forest in one way or another. The forests are of enormous material, recreational, spiritual and cultural value for Finland.

In the last few decades the multiple use concept has gained a permanent place in the forest vocabulary. Its importance has been stressed at the UN Conference on Environment and Development, at the conferences of the European forest ministers and at other international forums. The multiple use of forests can increase and diversify the economic and spiritual benefits the forests can offer. The cornerstones of the traditional multiple use in Finland encompass the "Every Man's Right", the great variety of recreational activities and the many ways of using the nature's products. Multiple use requires the participation and co-operation of numerous administrative bodies and non-governmental organisations.

Hunting continues to represent the old way of life in the wilderness and trapping traditions in Finland. The number of hunters has almost trebled since the 1930s and has by now reached a figure of 300,000, which in relative terms, is higher than in any other European country. Hunting is also subject to the principle of sustainable benefits. The value of game and recreation is approx. EUR 75 million per year. The monitoring of the game populations is given high priority in Finland. Forestry has an effect on wildlife food, shelter and welfare. The reduction in the area of old-growth forests and their fragmentation has reduced the grouse populations but, on the other hand, the moose has multiplied to become the most important game. In general, environmental prerequisites aimed at preserving wildlife can be taken into account in forest management. Variation of small forest stands will often provide the majority of wildlife species a favourable mixture of varied tree species, old and young forests, clearings and shrubs.

Reindeer husbandry is a characteristic source of livelihood of northern Finland, the economic and cultural influence of which becomes more and more apparent the further north you go. It is particularly important to preserve that way of life in such sparsely populated territories. Problems connected with reindeer husbandry include issues, such as scattered ownership, low profits from small herds, impairment of ranging land because of other uses and, finally, over-grazing. The economics and profitability of reindeer husbandry are based on the use of natural range. One of the most important measures for improving reindeer husbandry is the restoration of over-grazed winter ranges. By reindeer management plans and by rotating the use of range within the areas of reindeer husbandry associations, it should be possible to bring the range use back to a sustainable level. A committee appointed by the Ministry of Agriculture and Forestry is working on this subject. The detrimental effects caused by forestry on reindeer husbandry and, vice versa, the damage caused by reindeer grazing on forest regeneration, will be reduced by multi-objective forest and nature resource planning.

The "Every Man's Right", which allows the *picking* of wild berries, mushrooms and other forms of nature produce, affords recreation, leisure and health to four out of five Finns. These activities

attract all age groups and to some it provides also income. Out of the total crop of ripe berries, only 10 per cent are actually picked; of the mushrooms a mere 1 - 2 per cent. Increasing the volume of picking has proved difficult due to the large variation in quality and size of the crops from year to year, and because the profitability of commercial picking has remained very low. The exploitation of wild berries and forest mushrooms will be boosted by developing national crop forecasts, by increasing the amount of research into natural products and by improving the conditions for nature products networks and small size enterprises. Developing the level of processing of picked products, charting the export possibilities, supporting exports and removing the obstacles of trade are other issues of importance.

The forests are the most characteristic element of the Finnish *landscape*. In all the ten geographical provinces of the country, the forests together with the fields, waterways, islands and marshes form a combination of cultural and natural landscape, which gives each and every province a specific characteristic look of its own. Forests located in the vicinity of settled areas and farmland, and forests, which provide a view from afar, are given special consideration in forest management. National and provincial reports on national landscapes, traditional landscapes, prehistoric remains, special constructions and natural sites will receive due attention in all forest planning.

The forests are *cultural environments* in the sense that Man's influence can be seen even in the most remote forests. In addition to history of forestry such as logging areas and camps, floating huts and other constructions, the forests hide traces of early Finnish settlements, cultivation and war history. Mechanical timber harvesting, soil preparation and forest road construction can easily destroy prehistoric remains and other sites of cultural and historical value. On the other hand, reforestation and afforestation obscure all such sites. The forestry organisations must pay more attention to sites with cultural and historical value by intensifying their co-operation with the cultural authorities. In the planning of the Regional Forest Programmes the National Board of Antiquities and local museums should be consulted.

The forests provide Finns with their most important environment for *outdoor recreation*. Under the auspices of "Every Man's Right", people are seen roving in the woods in the neighbourhood of their homes or summer cottages. Orienteerers, boy scouts and girl guides often engage in activities in forests further afield, whereas national parks and trekking routes are used for hiking in the wilderness. Outdoor recreation is of great importance for physical and spiritual health and an important part of social sustainability of the use of forests. Well-managed commercial forests are very well suited to fulfil the demands of outdoor recreation within the limits of "Every Man's Right". The standard of trekking routes and other outdoor recreation services must, on the other hand, be improved with the co-operation of the state, municipalities and various associations. The first national inventory of forest recreation, which has just started, will give valuable information for the development of outdoor recreation.

The forests are also important for *tourism*. In addition to the national parks and other protected areas, commercial forests are a good tourist attraction. For tourism it is vital that the forests are managed according to the principles of sustainability and that outdoor recreation services are managed with proper public funding. Forest roads play also a significant role in outdoor recreation and tourism.

The multiple use of forests provides opportunities for expanding and diversifying business activities and employment connected with the forests. *Multiple use entrepreneurship*, such as the picking of natural products and their processing, tourism and various forms of recreational and trekking services provide new opportunities for business ventures which can help to preserve rural

society. Ways of creating services linked with nature tours, including products and marketing, will be developed.

Forest know-how will be strengthened

The aim of the National Forest Programme is to improve forest-related know-how through a stronger innovation based on research, education and expanding internationalisation.

The target of the long-range development plan of the State Board of Science and Technology is to create a Finland of knowledge and skill. The road towards this target is paved with research, education and internationalisation. The Government has committed itself to building a society based on knowledge and skill and has set a target to increase the budget for public and private research to a level of 2.9 per cent of the gross national product by 1999.

The forest cluster is one of the soundest cornerstones of Finnish knowledge and skill. It has been created around key products of papers and wood products. It incorporates various enterprises, which support each other with products and services. The interaction among various branches and companies as a source of new knowledge, skills, innovations and development is a vital component for the competitiveness of the forest cluster. Consequently, research and education constitute an indispensable ingredient in the forest cluster (footnote, page 7).

The research and development activities of the forest industry have expanded considerably in the last few years. For this purpose the forest industry spent EUR 120 million in 1997 out of which the private sector spent EUR 95 million. The proportion of money spent on research and development within the paper industry has been considerably larger than in the wood products industry. The annual expenditure on forest research, which is predominantly based on public funding, amounts to approx. EUR 50 million. The increased research funding within the public sector has been channelled mainly through the Technology Development Centre Tekes and the Academy of Finland.

Knowledge and skill can, as factors of production, grow without limits and create a self-generating growth. Research and education in the forest sector will be developed along such lines that Finland retains its international position amongst the highest ranks. The extension of knowledge and skills demand an effective and accessible system in order to reach those who are in need of this information, such as forest sector decision makers, the forest industry, small enterprises, forest owners and private citizens.

The interaction between producers and users of information will be improved by creating a *Forum for Innovation for the forest sector*. Its task will be to define important development targets for the creation and operation of innovations, to gather experts and customers within the field together and to forecast future demands. In order to discover new aspects, experts from the whole forest cluster, and even from the outside, will be called upon to pool their input. The arrangements are co-ordinated by a group of experts appointed by the Ministry of Agriculture and Forestry and headed by a secretary general.

The realisation of the research and development projects is the responsibility of the participants in the Forum for Innovation. The main responsibility for developing the innovations rests with the private sector, but the public sector will support the activity in many ways. In order to make the

innovative process more effective, the capability of interactive teamwork among the various parties must be strengthened.

Research will become customer oriented. In the selection of research subjects and in the planning of research projects the importance of customers' information needs must be stressed. An approach, which could be called "from the markets to the forest" shall be adopted. Via the Forum for Innovation, the users of information will be included in the process of setting up targets for the research and development and will also be allowed to take part in the actual research process. The secretary general of the Forum for Innovation and the group of experts will participate in the preparatory work of forest sector research programmes and will support the extension of the research results into practical use.

Putting the research results to practical use will be intensified by structurally and functionally improving the co-operation between forest research and forest development work. Joint research and development projects will be established on issues such as biodiversity and the sustainable utilisation of forests. The development work will be improved by reorganising it into development programmes. Regarding research financing, such projects are favoured where the customers participate in the planning and realisation of the projects. Research involving life cycle analysis will be developed. The joint compilation of research data and its joint utilisation will be put on a broader base.

The productive use of innovations in SME's will be advanced by paying more attention to the small companies' needs within the public funding of research and development. There must be a development of the services of the Employment and Trade Centres and support for national and international networking and for Centres for Excellence.

Education will be developed by securing the resources for basic university education. Post-graduate studies will be supported by various researcher training programmes. Education for doctoral degrees and higher professional studies will be supported. The Ministry of Agriculture and Forestry and the Ministry of Education will define the quantitative and qualitative targets for national and international forest and wood education in accordance with the principal aim of keeping Finland firmly in the top international ranks in forest know-how.

Interest and attraction in the forest branch will be elevated. The image of the whole forest branch will be put on a new footing through joint action involving the whole sector. The aim is to attract new students interested in and motivated by the forest branch.

The *training and advising forest owners* holds a key position in terms of forest management, ecological sustainability and the smooth functioning of the timber market. With the support of training and good practical advice, forest owners can base their forest decisions on high class knowledge and skills. Resources for training and advisory services will be doubled (pages 16 & 31).

Media exposure on forest issues will be increased. The forests are very important to the Finns as a source of recreation, but their economic and ecological importance is less and less understood. Consequently, the general public must be made aware of the forests' importance in generating welfare. Support of school education in forest matters and youth work will be included amongst the tasks of the forest and environment organisations and a part of the budget money for advisory and training purposes, co-ordinated by the Forest Centres, will be earmarked for youth work.

The *potential of the information technology society* will be used to full advantage. The opportunities offered by this new technology and communication networks will be used to supply forest owners, experts in the field and the general public with information services.

Finland takes an active part in international forest policies

The aim of the National Forest Programme is to further sustainable forestry by taking an active part in international forest policy and by co-operative research and training programmes and by pursuing active media exposure.

International influence is a vital part of Finnish forest policy. Consequently, Finland participates in various forums with a view to securing national interests. In order to create mutual understanding and uniform guidelines the communication and co-operation between the State administration, the business world and civic authorities will be organised.

International activities have an important role in supporting national forest policy. Commercial, ecological and ethical issues justify international activity. The Finnish forest sector is dependent on international trade, which is why Finland supports free trade and free competition. Around 14 million hectares of forest disappear every year all over the world. Finnish forest expertise must be utilised in the quest to reduce deforestation. In Europe Finland has been active in promoting the integration of forestry and environmental values.

In the next few years the Intergovernmental Forum on Forests, the conferences of European forest ministers and the preparation of forest issues within the European Union will play a pivotal role in international forest policy.

The work completed by the *Intergovernmental Panel on Forests (IPF)* in 1995-1997, working under the auspices of the United Nations Commission on Sustainable Development (CSD), will form the basis for forest policy co-operation over the next few years. The final report of IPF presented over one hundred proposals for action, which were endorsed during the Special Session of the UN General Assembly (UNGASS) in June 1997. The forest policy reforms in Finland during the 1990s and the principles of the National Forest Programme conform with these proposals.

Finland participates actively in the work of the *Intergovernmental Forum on Forests (IFF)* established for the period 1997 - 2000. Among other things, the forum will examine the possible contents of a general forest convention and attempt to build up mutual understanding in anticipation of the forthcoming process of negotiations. Finland's aim is to introduce a legally binding instrument on all types of forests in order to advance sustainable management, utilisation and protection of the forests. The Intergovernmental Forum on Forests could make a recommendation for starting up the forest convention negotiations at the 8th session of the UN Commission on Sustainable Development, in order to reach ratification on the forest convention as soon as possible after the beginning of the new millennium.

Finland continues to participate actively in the work of various *international organisations and bodies*, such as FAO, ITTO, UNDP, UNEP, which directly or indirectly deal with forest affairs. Moreover, Finland takes a co-ordinated and comprehensive part in the work of international and regional initiatives. The aim is to build up mutual understanding on forest related matters. A real challenge for the near future is the co-ordination of sustainable forestry with the Convention on

Biological Diversity and the Framework Convention on Climate Change and the Kyoto Protocol and in the definition of forests' role as sinks and reservoirs. Finland aims to carbon sink and reservoir capacity of the forests through research and forest inventories.

During the third *Ministerial Conference on the Protection of Forests in Europe* in Lisbon in June 1998 a general declaration and two resolutions were adopted. The resolutions emphasise the importance of realising the proposals of the IPF, co-operation with the "Environment for Europe" process of European ministers of the environment, and interaction and partnership between society and the forest sector. They also stress the importance of public participation in the planning of forest policy, the forest sector's importance for rural development and employment, and a rational increase in the use of wood and other forest products. Finland's National Forest Programme follows the principles of the Lisbon resolutions. The criteria and indicators of sustainable forestry will be used for monitoring the National Forest Programme (page 33).

In December 1998 the forest strategy for the *European Union* was approved, in which the economic, ecological and social importance of forests and their role for the rural livelihood was recognised. Finland continues to play an active role in forest affairs in the European Union and contributes to the recognition of sustainable forest utilisation and the competitiveness of the forest cluster. The co-ordination of forest affairs in the European Union should be improved and forest policy should, in the main, remain the responsibility of the individual countries concerned.

Finland's neighbouring countries possess vast forest resources and good opportunities for developing the forest cluster. Finland actively supports the development of the forest sector in Russia and the Baltic states with financial, scientific and technical aid. When importing timber, the principles of sustainable forestry must be observed.

Approximately EUR 12 million per year has been used in the *development aid projects* in the forest sector, which is nearly 10 per cent of Finland's total budget for aid related to joint-venture development projects. The development of forestry, afforestation, forest protection and forest industry development will remain focal points of Finnish aid.

International *co-operation in forest research* will be increased further in order to improve sustainable forestry nationally and globally. *Education* in international forestry and forest policy will be strengthened (page 25) and international *media exposure* and co-operation in communications will be made more effective in order to achieve a higher degree of global acceptance of paper and wood products.

Finland has a long track record in the field of forest *certification*. In addition to the domestic groundwork, international co-operation has been intensive. Finland supports the development of voluntary, market-orientated and competitively unbiased systems.

PREPARATION AND EVALUATION OF THE PROGRAMME

Transparent and open process

The starting points of the preparation of the National Forest Programme were the principles of transparency, co-operation, bottom-up approach and comprehensiveness. The drafting organisation had widespread representation on all levels, which ensured that different points of view were brought to light and integrated. During the process the work groups heard 38 experts. The National Forest Programme itself was discussed with 59 different public forums numbering a total number of 2,900 participants. Even the Regional Forest Programmes were prepared in the same spirit of open co-operation with the various interest groups.

In the state provinces open public forums were organised with the help of Regional Forest Centres both in the spring and in the autumn. In spring the aims and visions of the Forest Programme were discussed and in November the first draft was deliberated on. The spring round produced 49 announcements in writing and in the autumn the draft presentation resulted in 91 opinions in writing.

Web pages of the National Forest Programme were opened on 27 February 1998. They contain the basic documents of the National Forest Programme, the reports of the work groups, statements and a column for discussion. The various drafts of the Forest Programme dated 3.11.1998, 16.11.1998 and 16.12.1998 were set up for public view on the web pages for everyone interested at the very same time as they were handed out to the members of the work groups and the managing group. By the end of December the web pages had received 6,800 visitors.

The secretaries of the work groups used the feedback from the spring public forums when compiling the first draft. In the autumn, approx. half of the feedback from the first and second drafts could be used, since suggestions, which would have required drastic changes to the principles agreed upon within the work groups, had to be deferred due to the lack of time available. All the received opinions will be published in the appendix of the background report to be published separately.

Generally, this open and transparent approach was received favourably. Because of the tight time schedule all the issues could not be thoroughly addressed in the work groups or forums. Open co-operation places great demands on the participants due to the old truth that matters will only proceed in an atmosphere of genuine understanding and trust. Alas during the process it was not always possible to create such state of affairs.

Economic effects

Under the National Forest Programme the annual production of industrial roundwood will increase by 5 - 10 million cubic metres by the year 2010. According to the so-called "Kessu" calculations carried out by the Ministry of Finance, the resulting increase in the production of the forest industries in its present structure will improve the Governments annual balance of payment by EUR 0.8 - 1.5 billion and the whole public economy's balance of payment by EUR 1.2 - 2.2 billion per year. Exports will grow by 3 - 6 per cent and imports by 1 - 2 per cent per year, which would result in a trade surplus.

The input-output model used in the Kessu calculations does not take into account structural changes within the industry, such as increased value-added production. By raising the level of transformation in the wood industry both export earnings and the employment can be increased.

By the year 2010 export earnings will increase by EUR 1.7 - 3.4 billion per year, half of which will be achieved by an increase in the volume of industry's production. The other half will come from a greater value-added.

By the year 2010 annual stumpage price earnings will rise by EUR 100 - 250 million. Out of this sum approx. EUR 35 - 65 million will be paid in forest tax to the State. A more effective degree of production in the forest sector will improve the profitability of forestry from about EUR 98 to EUR 103 - 104 per hectare per year. A major part of the increase in stumpage prices, salaries and entrepreneurs' earnings will remain in rural areas.

Social effects

The increasing production of forestry and the forest industries, the higher degree of processing in the wood industry and the increasing use of energy wood will support rural employment and development.

By 2010 forestry and the forest industry will employ from 10,000 to 15,000 more people as a result of the National Forest Programme than they would without it. Despite the production growth there will, however, be a reduction in the workforce from today's figure of 95,000 to approx. 80,000. According to the "Kessu" calculations made by the Ministry of Finance, the total national economy will provide 30,000 - 40,000 more jobs than there would be without the Forest Programme. The Kessu calculation does not take into account the potential increase in the degree of processing within the wood industry, which means that the total employment effect would be 35,000 - 45,000 jobs.

Jobs in the forest sector and stumpage revenues support the businesses and services in the countryside and the development of village centres. Well-managed forests and a road network in good condition contribute to creating good opportunities for the multiple use of forests. Social and cultural values of the forests are given due attention in the open planning and implementation of the National and Regional Forest Programmes.

Environmental effects

The aim of the Forest Programme is to establish a favourable level of protection for the forest species and habitats. The programme will be implemented in accordance with the forest and environmental legislation and the Environmental Programme for Forestry. The amount of certain forestry activities will increase by the year 2010, therefore it follows that a careful environmental impact assessment is a justifiable part of the National Forest Programme process.

The timber production alternatives of the Forest Programme were decided by the work groups in October and the Mela calculations were finalised at the beginning of November. Detailed evaluation of the effects of the various measures listed in the Forest Programme could not be accomplished within the given time schedule. Neither could any assessment be made about the effects of increased transportation and the use of energy. Consequently, it was decided to produce

a preliminary assessment of environmental impacts immediately, and prior to the actual implementation of the Forest Programme another, more in depth and detailed impact assessment will be made. Its results will then, if necessary, be used to make amendments to the programme before the implementation starts in the year 2000. The preliminary environmental impact assessment is presented in appendix 2.

Chances for the programme to succeed

The National Forest Programme indicates the direction of sustainable forestry during the first decade of the new millennium. There are many uncertain factors linked with the realisation of the programme, which must be taken into account so that the programme can be adjusted when needed. Among other things the Forest Committee must pay attention to the following matters:

Will the forest industry's use of domestic roundwood and the use of energy wood increase in line with the programme? Stumpage prices may increase because of growing demand, which, in turn, can make the industry turn to imports to satisfy demand. On the other hand, an increase in imported timber could result in a decrease in the demand for domestic roundwood and lower stumpage prices. If domestic logging does not expand as anticipated, the profitability of investments in silviculture and forest improvement will decrease and the amount of investments will need to be adjusted. The transition period for forest area taxation will end by the year 2005, which may have an effect on the timber supply.

Will the fellings be carried out in accordance with the estimated sustainable production as specified for different roundwood assortments and regions? The current use of wood in industry differs in some respects from the sustainable assortment distribution. Fellings should be concentrated on pulpwood and pine in general, on the old spruce dominated forests in southern Finland and on peat lands.

The economic and employment effects of the programme are dependent on how the productivity in forestry and the forest industry develops, how attempts to raise the value-added production within the wood products industry succeed, how small size enterprises develop and how much the use of energy wood increases.

Will the Forest Programme secure the ecological sustainability? The biological diversity of commercial forests and the conservation of forests in southern Finland will be developed, but the development of biodiversity must be continuously followed by research and monitoring, and adjustments to the activities of forestry must be made whenever it is found to be necessary. Prior to the actual implementation of the programme, a detailed environmental impact assessment will be made and the programme will be adjusted where needed.

Will the forestry remain profitable enough to prompt the forest owners to increase silvicultural and forest improvement investments to meet the targets of the programme? Wood prices, costs of silviculture, state subsidies and felling volumes will all cause annual fluctuations in profitability.

Will Government's support for forest owners' training, advisory services, forest planning, silvicultural and improvement works and ecosystem management increase in line with the premises of the programme? If the support does not lead to the target levels of forest and ecosystem management, the programme will have to be adjusted.

Do rural areas have a sufficient amount of skilled labour for the increasing silvicultural works and first thinnings? If silviculture lags behind recommendations due to lack of labour or for other reasons, the sustainable roundwood production will decrease over the next decades.

Can forest know-how be developed in co-operation with the business sector, research, development and educational institutions and will there be sufficient resources? Education on different levels, research and development co-operation and, in particular, the elevation of the value-added in the wood products industry, all have a need for development which will, in turn, have a significant influence on the future of the whole forest sector.

RESOURCES OF THE PROGRAMME

In the private sector forest industry companies are expected to invest EUR 1.0 - 1.3 billion in plant renovation and repair projects annually until the year 2010. This would lead to an annual increase in the industry's use of wood by approx. 10 million cubic metres.

The forest owners are expected to invest approx. EUR 190 million per year on silviculture and forest improvement, which represents an increase of EUR 65 million compared to the 1998 level. The increase will be possible through increased timber sales income, state support and better training and advisory services. For the protection of key biotopes and retaining single trees and tree groups in felling areas forest owners invest approx. EUR 35 million each year. Furthermore, forest owners voluntarily protect various kinds of forest stands, but there is no reliable information regarding the extent and value of these.

Additional investments in equipment for timber harvesting and transports, and wood-burning power plants come within the private sector.

In the public sector the National Forest Programme will affect the activities of many ministries. Forestry and rural development is basically the responsibility of the Ministry of Agriculture and Forestry. The overall regional development is the responsibility of the Ministry of the Interior. Forest conservation issues belong to the Ministry of the Environment. Energy prices, the development of SME's and issues of competition belong to the Ministry of Trade and Industry. Education and research belong to the Ministry of Education, but forest sector research is, in addition, spread among the Ministry of Agriculture and Forestry, the Ministry of Trade and Industry and the Ministry of the Environment. The development of the employment is a matter for the Ministry of Labour, and the maintenance of the road network belongs to the Ministry of Transport and Communications. Multiple use of forests is shared by the Ministries of Agriculture and Forestry, Education, Environment, and Trade and Industry.

The tight time schedule for the drafting of the Forest Programme did not allow for the preparation of detailed suggestions for action for Ministries other than the Ministry of Agriculture and Forestry. Suggestions and recommendations will be dealt with in more detail by the Forest Committee in co-operation with the various ministries as soon as the implementation of the Forest Programme is under way.

Financing by the *Ministry of Agriculture and Forestry* will be developed according to appendix 3 (page 35). During the 1990s the state subsidy for the Forest Centres decreased from EUR 56 million to EUR 33 million. In order to increase forest planning and advisory and training services for the forest owners, to renew the data processing systems and equipment of the Forest Centres, and to strengthen their public authority services, the state subsidy to the Forest Centres will be increased to EUR 43 million on an annual basis.

The subsidy for silviculture and forest improvement dropped from EUR 64 million to EUR 49 million during the 1990s. In order to secure the sustainability of private forestry Government support will be raised to EUR 59 million per year, and the increase will be used for reforestation, management of young stands, drainage reconditioning, basic improvement of forest roads and joint construction of new roads. The share of Government support of the total costs of silviculture and forest improvement will decrease from 27 to 23 - 24 per cent. Government loans for joint-venture projects are expected to rise from EUR 0.3 million to EUR 2.5 million.

The annual funding of ecosystem management will be increased from EUR 2.5 million to EUR 4.2 million. This funding will be used for environmental subsidies to forest owners to compensate their financial losses due to the protection of important habitats, for large ecosystem management projects and for finishing the inventory of particularly important habitats listed in the Forest Act.

The financing of the Forest Committee, its secretariat and work groups, appointed to implement and monitor the National Forest Programme, will be covered by the Ministry of Agriculture and Forestry.

Financing by the Ministry of the Environment In order to implement ratified Conservation Programmes on privately owned land in 1996-2007 a total of EUR 560 million has been reserved, out of which approx. EUR 170 million will go to forest conservation. A total of EUR 180 million of the financing programme will be covered by the Finnish Forest and Park Service land exchanges and property sales earnings.

Financing of nature conservation areas will be increased from EUR 12.1 million to EUR 14.1 million by the year 2000 and raised to EUR 16.1 million by the year 2003.

Concerning the Conservation Programme for the forests of southern Finland, the need and modes of funding will be clarified during the compilation of the programme.

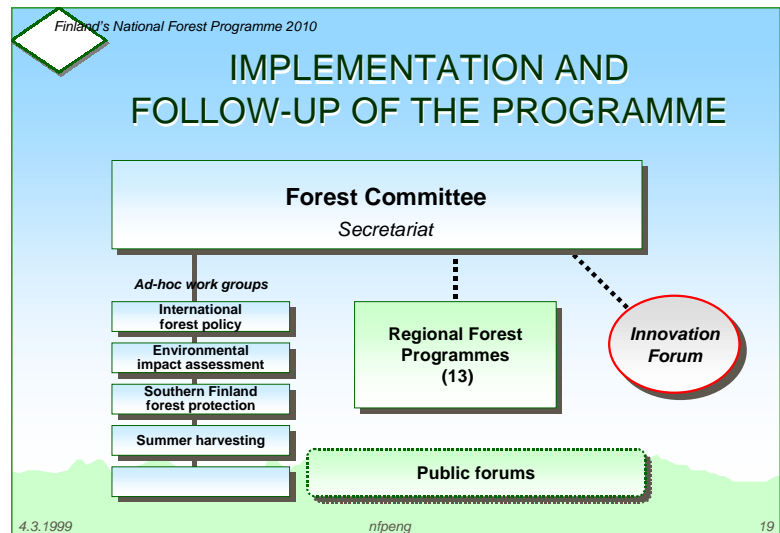
European Union development funding for forest sector projects has been approx. EUR 1.7 million annually through the Employment and Trade Centres. The aim of the Forest Programme is to raise EU financing to EUR 2.5 million a year.

Certain new subsidies for forestry have been under preparation within the European Union's Agenda 2000 programme. Finland has not supported these subsidies, but in the event they come into force, they will, of course, be observed in the funding of the Forest Programme for the years to come.

PROGRAMME IMPLEMENTATION, FOLLOW-UP AND DEVELOPMENT

The National Forest Programme will be implemented in co-operation with all the parties of the forest sector. The tasks of different parties in the wood markets are, in particular, to promote the functioning of the timber market and to influence correct direction of fellings in order to favour forest development. The various ministries and other state authorities will follow the guidelines of the Forest Programme in their own activities.

To implement and follow the National Forest Programme a *Forest Committee* lead by the Minister of Agriculture and Forestry will be established in which various ministries, business interests, associations and expert organisations will be represented. The *Secretariat* will be responsible for the preparatory arrangements of the Committee's work. In addition to the implementation and follow-up, the Forest Committee should evaluate different alternatives of ecological and social sustainability and to use the results for developing the Forest Programme.



Ad-hoc *work groups* subordinated to the Forest Council will be appointed when necessary. Work groups dealing with international forest policy, conservation of forests in southern Finland, and summer harvesting, will all be appointed immediately. The environmental impact assessment will be commissioned from an independent group of experts.

In addition to the ad-hoc work groups, the *Forum for Innovation* will work in close connection with the Forest Committee.

The follow-up and development of *Regional Forest Programmes* will be a part of the Forest Committee's responsibilities. The Regional Forest Programmes will be revised in accordance with the guidelines of the National Forest Programme, and their evaluation will be reported as part of National Forest programme reporting.

The European criteria and indicators of sustainable forestry will be used in monitoring the Forest Programme. An accompanying task of the work group on international forest policy is to support the practical activities in international forest policy.

In the follow-up process of the Forest Programme the same principles of openness and transparency will be followed as when the programme was being drafted. *Public forums* will be arranged in connection with the publication of follow-up reports and, when necessary, in connection with the work of the work groups. The Web pages of the Forest Programme will be maintained as a forum for interaction.

Appendix 1. Development of the forests according to different alternatives

The development the forests with four harvesting alternatives was calculated with the Mela programme of the Finnish Forest Research Institute. The calculations were made for the forest land, scrub land and waste land available for timber production, representing a total area of 21.5 million hectares. The area was presumed to remain unchanged. Outside of wood production there were 4.6 million hectares, which included the areas of ratified Conservation Programmes to be implemented by the year 2007. All the herb-rich groves are left outside harvesting. The growth models were based on the growth rates of 1965 - 1995. In the calculations, five cubic metres of standing trees per hectare were left in the regeneration areas. Silvicultural works were presumed to be accomplished in accordance with the recommendations of the Forestry Development Centre Tapio.

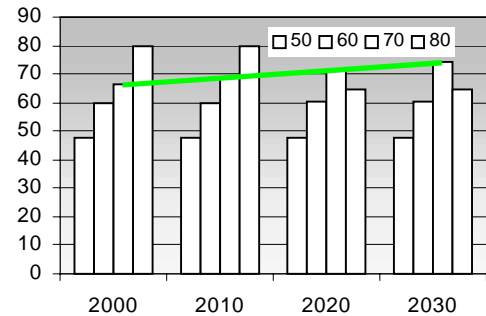
A roundwood production of 50 million cubic metres

In the period of 1987 - 1996 the production of roundwood passing the minimum diameter amounted to an average of 48 million cubic metres per year. If harvesting were to continue at the same rate, the volume of the growing stock would increase from its present total of 1,785 million to 2,100 million cubic metres by the year 2010. The annual increment would rise from 75 million to 81 million cubic metres. During the following decades the annual increment would increase to 100 million cubic metres and the total growing stock would pass 2,500 million cubic metres. Such high figures would probably not be reached in reality, as the Mela calculations do not take into account the detrimental effect of over-density and over-age.

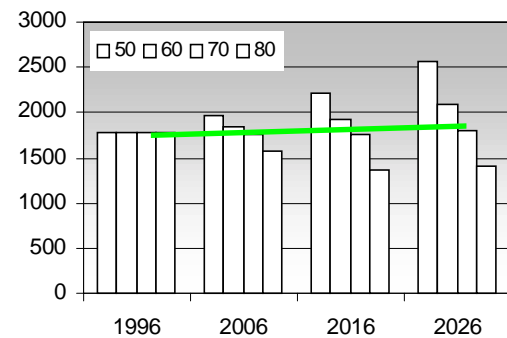
A roundwood production of 60 million cubic metres

The roundwood production for has been estimated as 57 - 58 million cubic metres in the 1998 - 1999. The Mela calculation was based on an annual level of 60 million cubic metres. At this harvesting rate the volume of the growing stock would grow from 1,785 million to 1,900 million cubic metres by 2010, and the annual increment from 75 million to 78 million cubic metres. During the following decades the growing stock would grow to 2,100 million cubic metres and the increment to 95 million cubic metres.

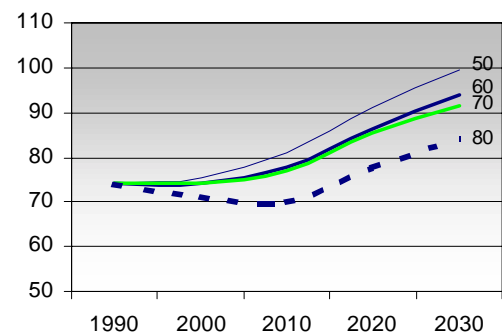
Roundwood production, mill. m³



Growing stock, mill. m³



Increment, mill. m³



A roundwood production of 70 million cubic metres

According to the Mela calculations the largest sustainable roundwood production is 67 million cubic metres per year during 1996 - 2005. After this it will rise to 69 million cubic metres and then gradually to 74 million cubic metres by the year 2030. If harvesting volumes were kept at these rates, the growing stock would remain at its present level until the year 2020, after which a small growth will take place. The annual increment would increase to 77 million cubic metres by the year 2010 and to 90 million cubic metres by the year 2030.

A roundwood production of 80 million cubic metres

A roundwood production of 80 million cubic metres would be possible for a period of 20 years. According to the forest management recommendations, even a harvest of 100 million cubic metres would be possible over the next 10 years. An annual harvesting rate of 80 million cubic metres would lead to a decrease in the growing stock to 1,400 million cubic metres by the mid 2010s, and the annual increment would drop to 70 million cubic metres. After that the harvesting reserve would be exhausted and the allowable cut, according the forest management recommendations, would have to drop to 65 million cubic metres, until the volume of the growing stock and the increment start to recover.

Appendix 2. Preliminary assessment of environmental impacts

With the assistance of three experts, a quick assessment was made with respect to the effects to the biological diversity by the changes in silviculture and forest improvement. According to the assessment, it appears that the quality of work, i.e. how it is performed, has a greater effect on the environment than a slight rise in the volumes of certain works. By following the environmental instructions and recommendations and the methods recommended in the Environmental Programme for Forestry, the National Forest Programme does not seem to have any greater effects on biodiversity of the forests. The assessment must be seen as a preliminary charting, which has to be completed and checked in the forthcoming comprehensive environmental impact assessment. Consequently, this preliminary assessment must not be interpreted as an expression of opinion by the management group or the work groups of the National Forest Programme.

According to the Mela calculations, *clear-cutting* will gradually increase during the first decade from its present level of 130,000 hectares to 135,000 - 150,000 hectares per year after which the figure will drop back to 130,000 hectares. The effects of clear-cutting depend to a great extent on where and what type of forest is felled. If, in accordance with the recommendations for forest management, sufficient trees are left standing, dead standing trees and windfalls are left untouched, and clear-cutting is not performed on key biotopes or other sites of special value for biodiversity, an increase will not have a detrimental impact on the preservation of the biological diversity. By leaving protection zones the phosphorous and nitrogenous load on water systems will be reduced to half of that in 1993. Forest conservation will be furthered by the establishment of a work group for the conservation of forests in southern Finland.

Seed tree and shelterwood felling will be kept at its present level of 60,000 hectares per year. Whether created through natural seedlings or artificial regeneration make no significant difference to the biodiversity, as it is not until tending of the young stands that the structure of the developing forest stand is determined.

Partly because forest management work is behind schedule, *tending of seedling stands* will expand from 150,000 hectares to 250,000 hectares per year. It will be realised according to recommendations and instructions which state that a 5 - 30 per cent share of deciduous seedlings should be left among conifers to secure the preconditions of biodiversity.

The amount of *first thinnings* will increase from 125,000 hectares to 250,000 hectares per year. The increase will not have much effect on biodiversity. To leave deciduous trees and old, even damaged trees standing is recommended in view of a future stock of decayed, hollow and conserved trees. It is important for the general health of the trees that the first thinning is carried out on time.

The amount of *other thinnings* will increase from 150,000 hectares to approx. 200,000 hectares a year. Deciduous trees, dying and dead trees should be left untouched for those species that need them. Thinning improves the forest's resistance to pests and diseases.

The aim is to increase the use of *energy wood* by 5 million cubic metres. Energy wood is harvested in connection with the management of young stands, first thinnings and as logging waste. By following the principles mentioned earlier there should be no major effects on biodiversity. The collection of energy wood will promote the development of the forests and improve the carbon balance as it replaces fossil fuels.

Ditch cleaning and supplementary drainage will be increased from 75,000 hectares to 110,000 hectares per year. The maintenance and use of the drainage sites must be analysed as an entity which includes the water management, the nutrient balance, the need for thinning, regeneration, transport and road access, ecosystem management and, in particular, the protection of the water system. In suitable places key biotopes can be restored into their natural condition. The load imposed on the water system by drainage restoration will be continuously decreased. Drainage restoration improves the vitality of the trees and improves their resistance to pests and diseases.

The amount of forest *fertilisation* is presumed to stay the same at around 15,000 hectares per year. Fertilisation does not affect biodiversity to any significant degree. Surface vegetation and soil organisms alter temporarily but when the effect of fertilisation ends the situation changes back to normal.

Reconditioning fertilisation will be increased from 2,000 hectares to 10,000 hectares per year. Reconditioning fertilisation corrects the nutritious balance of peat land where the condition of the trees has weakened.

Ash fertilisation might grow as the use of energy wood increases. The use of ash fertilisation, which is mostly done on peat land, will restore to the forest such nutrients, which have been removed in connection with harvesting.

The *construction of forest roads* will drop from 2,000 kilometres to about 1,000 kilometres a year. If due attention is paid to valuable nature sites the effects on the biodiversity will remain small. Road barriers can be used to prevent the disturbance by recreational activities in the vicinity of valuable nature sites.

Basic improvement of forest roads will grow from 1,000 kilometres to approx. 2,000 kilometres per year. Improvement work does not basically change the situation from what it was when the road was originally built.

Field afforestation of former farmland is estimated to remain at the present level of approx. 10,000 hectares per year. Field afforestation can increase the diversity when using predominantly deciduous trees. Natural meadows with a valuable richness of species should not be afforested.

As *carbon sinks* the forests bind the carbon of the atmosphere. Afforestation on treeless areas, such as fields and peatland grounds will increase the carbon sink. When harvesting is increased in accordance with the Forest Programme, the volume of the growing stock remains unchanged until 2010, after which it will start to grow, and so the carbon assimilation effect will be positive.

Appendix 3. Financing by the Ministry of Agriculture and Forestry

State subsidy to the promotional and supervisory organisations of forestry

yr. 1999	EUR 33.3 million	
yr. 2000	EUR 42.6 million	change 1999/2000 EUR +9.3 million
yr. 2003	EUR 40.9 million	change 1999/2003 EUR +7.6 million

Out of the increase for the year 2000 EUR 4.2 million are due to the increase in forest planning, EUR 3.4 million due to the increase in formation and advisory services to the forest owners, and EUR 1.7 million to exceptional data processing expenses. During the period 1992 - 1999 state subsidy decreased by EUR 22.2 million

Subsidy for securing the sustainability of wood production

yr. 1999	EUR 48.8 million	
yr. 2000	EUR 58.9 million	change 1999/2000 EUR +10.0 million
yr. 2003	EUR 57.2 million	change 1999/2003 EUR + 8.4 million

The year 2000 State subsidy will be allocated to the following items:

- forest regeneration	EUR 11.8 million
- young stand management	EUR 25.2 million
- ditch cleaning*	EUR 13.5 million
- construction of forest roads**	EUR 8.4 million
Total	EUR 58.9 million

* Ditch cleaning investments also include water protection and preservation work

** Mainly basic improvement of forest roads and joint-venture projects

Loans for securing the sustainability of wood production

yr. 1999	EUR 0.3 million	
yr. 2000	EUR 0.8 million	change 1999/2000 EUR +0.5 million
yr. 2003	EUR 2.5 million	change 1999/2003 EUR +2.2 million

In joint ditch cleaning and forest road projects, carried out according to the Sustainable Forestry Financing Act, the share of loans will probably increase in the coming years.

Subsidy for promoting the forest ecosystem management

yr. 1999	EUR 0.3 million	
yr. 2000	EUR 0.8 million	change 1999/2000 EUR +1.7 million
yr. 2003	EUR 4.2 million	change 1999/2000 EUR +1.7 million

Out of the increase for the year 2000, EUR 0.8 million are due to the increase in environmental subsidy and ecosystem management projects, and EUR 0.8 million are due to the intensification of the inventory of especially valuable habitats defined in the Forest Act. After the inventory has been finished, the subsidy will be redirected to environmental subsidy and ecosystem management projects. Increasing the flexibility of the criteria for subsidy should be considered, as well as further increasing the financing.

Appendix 4. Working groups

Ministerial group

Kalevi Hemilä
Matti Aura
Jan-Erik Enestam
Pekka Haavisto
Terttu Huttu-Juntunen
Antti Kalliomäki

Steering group

Kalevi Hemilä (chair)
Nina Hagner-Wahlsten
Sirkka Hautojärvi
Jan Heino
Timo Helle
Eeva Hellström
Esa Härmälä
Runar Lilland
Markku Mäkinen (-20.8)
Timo Poranen
Meri Saarnilahti-Becker
(-20.8)
Raimo Sailas
Timo Tanninen (21.8-)
Kalevi Vanhala
Tuija Vihavainen
Erkki Virtanen (21.8-)
Secretary general:
Aarne Reunala

Executive committee

Jan Heino pr.
Martin Lilland
Jouko Paloniemi
Liisa Saarenmaa
Hannu Valtanen
Aarne Reunala
Jukka-Pekka Jäppinen
Pentti Lähteenoja
Juha Hakkarainen
Matti Heikurainen

Forest management and protection work group

Jouko Paloniemi (chair)
Anju Asunta (1.10-)
Erja Fagerlund (-31.5)
Marja Hilska-Aaltonen
Esa Hyvärinen (1.6-)
Esko Joutsamo
Harri Karjalainen (-30.9)
Timo Kivimaa
Kari Mielikäinen
Tuula Nuutinen
Timo Nyrhinen
Suvi Raivio
Pekka Salminen
Irja Seurujärvi-Kari (-31.5)
Eero Tilli
Eila Valtanen
Secretaries:
Pentti Lähteenoja
Jukka-Pekka Jäppinen
Sauli Valkonen

Forest utilisation and markets work group

Martin Lilland (chair)
Hannu Valtanen (chair)
Esa Hyvärinen
Pirkko Isoviita
Marja Kokkonen
Armi Korkeaniemi
Pentti Näreaho
Timo Paakkunainen
Matti Peltola
Voitto Pölkki
Kalevi Väisänen
Secretaries:
Juha Hakkarainen
Ari Keskimölo
Erkki Uusitalo

Forestry innovation work group

Liisa Saarenmaa (chair)
Kerttu Härkönen
Vesa Imponen
Taneli Kolström
Jouko Lehtoviita
Paula Nybergh
Marketta Sipi
Heikki Toivonen
Ritva Toivonen
Martti Varmola
Karen Wik-Portin
Secretaries:
Matti Heikurainen
Ritva Ihalainen
Ossi Malmberg

Experts

Lauri Ainasto
Pekka Airaksinen
Erkki Annala
Riitta Backman
Simo Jaakkola
Auvo Kaivola
Pertti Litmanen
Jouko Mäkelä
Jari Niemelä
Sami Niemi
Heikki Parkkonen
Anders Portin
Olli Saastamoinen
Olli Salminen
Jouni Suoheimo
Marko Synkkänen

Technical support

Leena Halko
Raija Lahtinen
Sirpa Lääperi
Marjatta Määttä
Leena Partanen
Vesa Vuorimaa