

## The Forest 2000 Programme

### Guidelines for developing Finnish forestry and the forest industries

*TIIVISTELMÄ: METSÄ 2000-OHJELMA*

The Forest 2000 Programme. Guidelines for developing Finnish forestry and the forest industries. Tiivistelmä: Metsä 2000-ohjelma. Silva Fennica 20 (1):35-44.

The Forest 2000 Programme is a long-term programme for forestry and the forest industries. It attempts to obtain a better integration of timber production and other forms of forest use. The total annual cut is to be increased by 15 mill. m<sup>3</sup> by the year 2010. This is almost one third greater than the level during the first few years of the 1980's. In order to achieve the cutting targets, the cut area will have to be increased by almost a third by the turn of the century. The area of thinnings will experience the greatest increase. Considerable changes are proposed in silvicultural and basic improvement work. According to the programme, the growth of the raw-material base and the consumption of the wood-based products will permit an annual increase of about 3 % in the production of the forest industries as a whole until the end of the century. This would be the same as the target growth rate of the GNP.

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Metsä 2000-ohjelma on metsä- ja puutalouden pitkän aikavälin ohjelma. Siinä pyritään sopeuttamaan entistä paremmin toisiinsa puuntuotanto ja metsien muut käyttömuodot. Vuoteen 2010 mennessä on tavoitteena metsien vuotuisen hakkuumäärän suurentaminen 15 milj. m<sup>3</sup>:llä eli lähes kolmanneksella 1980-luvun alkuvuosiin verrattuna. Hakkuutavoitteiden saavuttamiseksi on hakkuupinta-aloja suurennettava. Voimakkaimmin kasvaa harvennushakkuiden ala. Metsänhoito- ja perusparannustöihin esitetään huomattavia muutoksia. Ohjelman mukainen raaka-ainepohjan kasvu ja metsäteollisuustuotteiden käytön kehitysnäkymät mahdollistavat arvion mukaan koko metsäteollisuuden tuotannon nostamisen vuosittain noin 3 prosentilla vuosisadan loppuun saakka. Se olisi sama kuin yleisesti tavoitteeksi asetettu bruttokansantuotteen kasvuvauhti.

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## The task and organization of the programme

The Forest 2000 Programme sub-committee was appointed by the Economic Council on the 21st of February 1983. The task of the sub-committee was to draw up a long-term programme for forestry and the forest industries. The sub-committee consisted of a group of executive representatives from various important interest groups, as well as a working

committee subordinated to it. Working groups for silviculture and forest management, for timber procurement, for the development of the forest industries, and for the multiple-use of forests were set up by the sub-committee to procure the information for drawing up the programme.

## The elements of the programme

Alternative analysis was used in defining the cutting and timber production targets of the programme, and in determining the development prospects of the wood-processing industry. This meant that the most important environmental factors, such as trends in the demand for products of the forest industries and the overall effect of the multiple-use of forestry, could be taken into account in the

profitability calculations carried out for the comparison. The goals of the Forest 2000 Programme were finalised on the basis of the results of the alternative calculations. As well as defining the goals, an attempt was made to develop the economic, industrial and forest policy instruments needed to achieve these goals.

## Methods

A modified version of the MELA forest calculation programme, recently developed by the Finnish Forest Research Institute and the Department of Forest Mensuration (University of Helsinki) was used in designing the cutting and timber production programme. In the first stage, MELA simulated the management options for the stands, and the development of the stands when managed accordingly. In the second stage, the programme assembled from these management alternatives a cutting and timber production programme implementing the cutting removal or other targets set for the management of the forests.

When preparing the different options available to the Forest 2000 Programme, the forest calculation programme was used both for defining the combination of measures de-

signed to produce the desired removal, and for determining the development of the growing stock and the removal achievable through a particular combination of measures. At the same time, an attempt was made to ensure that the achieved solution was also economically optimal.

The analysis of the cutting and timber production options also included a profitability comparison of the different alternatives. Cost-benefit analysis was used in the comparison. The result showed that as the cutting removal increased, the profitability only improved if industry was able to utilize all the roundwood which became available. At least this was the case when sustained yield management was practised, i.e. where the cutting potential did not decrease in the future.

## The objectives of the programme

The starting point when practising a forestry and wood-based economy is to increase the prosperity of society through the exploitation of the forests. The most important aims of forest policy are: 1) support for the general targets of economic policy, 2) balanced development of the different forms of forest use, 3) complete utilization of the productive capacity of forest land, 4) economic viability of the measures applied, 5) matching the timber assortment structure and volume of timber utilized with the cutting potential, and 6) the creation of conditions favourable for viable forest-based industries.

Considerable investments were made in silvicultural and basic improvement work in Finnish forestry during the 1960's and 1970's in order to increase timber production. As a result, the annual cutting potential has increased since the middle of the 1950's by 13–14 mill. m<sup>3</sup>. At the same time, the use of

wood as fuel and the export of roundwood have considerably decreased. Timber imports have correspondingly increased. Although industrial wood raw material consumption has more than doubled, the overall trend in the annual cut has slightly decreased. An increasing proportion of the cutting potential has remained unexploited since the middle of the 1960's. The difference between the annual allowable cut and total removal, mainly in the form of large-dimensioned spruce and non-coniferous cordwood, has over the years been about 10 mill. m<sup>3</sup>/a. This is equivalent to a good 15 % of the potential cut.

Following the objectives and factors outlined above, the main emphasis in the Forest 2000 Programme is directed at increasing the level of cuttings. At the same time, attention is paid to the role of silvicultural and basic improvement work in increasing timber production.

## The multiple-use of forests

The programme attempts to obtain a better integration of timber production and other forms of forest use. The total value of all the subsidiary forest products was, at the beginning of the 1980's, approximately 10 % of the value of the timber cut annually along long-distance transport routes. The area of forest land reserved mainly for protection and recreational use totals 1.7 mill. ha. This area is expected to increase by only about 0.1–0.2

mill. ha by the year 2000.

Multiple-use applications are expected to decrease the annual cutting potential by a total of 2.2 mill. m<sup>3</sup> (3–4 %) by the year 2000. The programme notes that more attention should be paid to the needs of multiple forest use, in addition to timber production, both in planning and in the measures employed in forestry.

## Cutting and timber production targets

The removal targets of the Forestry 2000 Programme, i.e. the targeted amounts of roundwood harvested from the forests, are presented in Table 1 and Fig. 1.

The total annual cut is to be increased by 15 mill. m<sup>3</sup> by the year 2010. This is almost one third greater than the level during the first few years of the 1980's. Achieving this

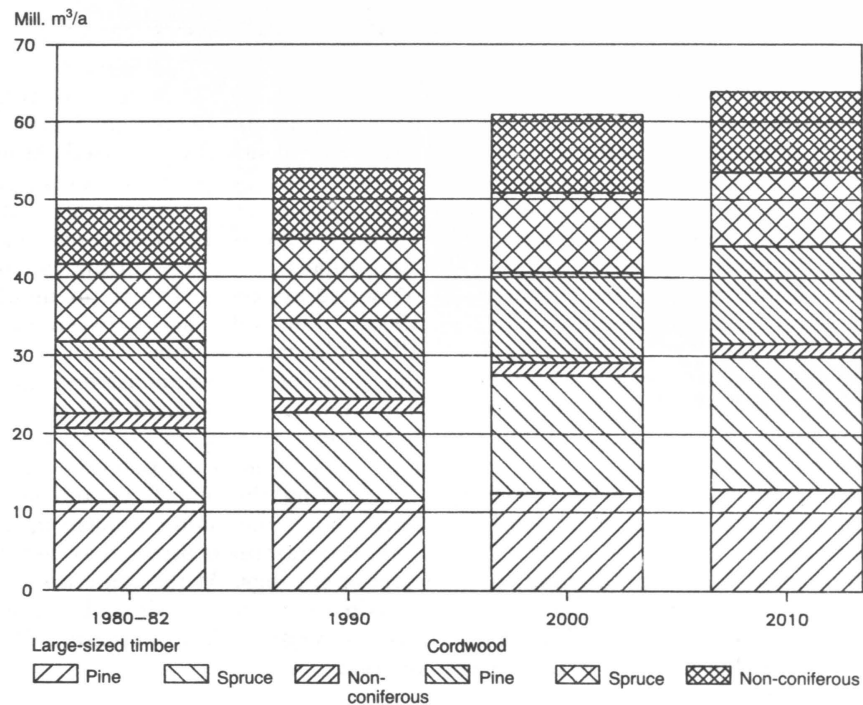


Fig. 1. The removal targets of the Forest 2000 Programme. The cut can be increased annually by 650 000 m<sup>3</sup> until 2000. Almost half of this increase is large-sized sprucelogs, and a third pine and non-coniferous cordwood.

Table 1. The removal targets of the Forest 2000 Programme.

Type	Implemented 1980-82	Targets		
		1990	2000	2010
Total	48.8	54.0	61.0	64.0
Pine	20.5	21.5	24.0	25.5
Spruce	19.4	21.8	25.3	26.5
Non-coniferous	8.9	10.7	11.7	12.0
Of which:				
Large-sized timber	22.6	24.5	29.2	31.7
Pine	11.3	11.5	12.5	13.0
Spruce	9.5	11.3	15.0	17.0
Non-coniferous	1.8	1.7	1.7	1.7
Cordwood	26.2	29.5	31.8	32.3
Pine	9.2	10.0	11.5	12.5
Spruce	9.9	10.5	10.3	9.5
Non-coniferous	7.1	9.0	10.0	10.3

goal presupposes that the cutting potential is exploited to a greater extent than was the case during the 1970's and 1980's. Half of the increase in cuttings would be large-sized spruce logs and a fifth deciduous cordwood. Cuttings of these timber assortments have decreased during the past few years. The cutting targets of other timber assortments, apart from large-sized hardwood logs, are also to be increased. In order to achieve the cutting targets, the area cut will have to be increased by almost a third by the turn of the century (Fig. 2). The annual area of thinnings will experience a considerable increase (70 %).

Considerable changes are proposed in silvicultural and basic improvement work (Figs. 3 and 4), e.g. the proportion of natural regeneration will be increased in forest regeneration work. A start has already been made on this part of the programme. Site preparation and the cleaning of regeneration areas will

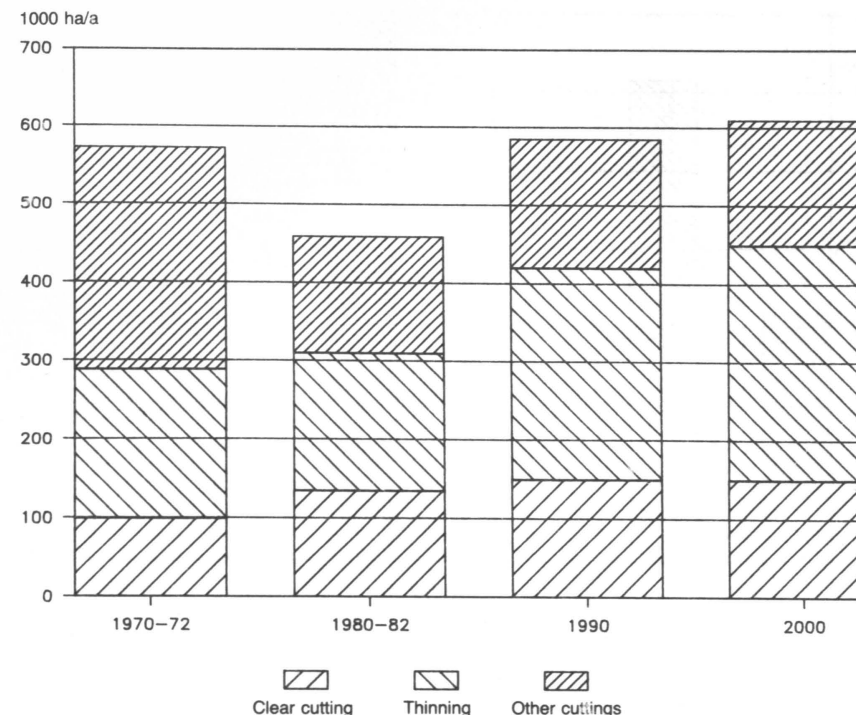


Fig. 2. The cutting areas of the Forest 2000 Programme. The area of the annual cut will increase by almost a third from the present level. The main emphasis is on thinnings, but the area of regeneration cuttings will also increase.

increase to some extent; a technology less harmful to the environment will be used on these sites. Artificial regeneration will see a slight shift from planting to sowing. The greatest changes will occur, however, in basic improvement work. All new drainage work is to be completed before the end of the century. The amount of redrainage, which includes ditch cleaning and supplementary drainage, should triple by the year 2000. The level of forest fertilization is expected to double. It is also proposed that the pruning of standing trees be increased.

The calculations indicate that the programme will lead to a 20-30 % increase in the costs of silvicultural and basic improvement work by the end of the century, and an in-

crease of about 10 % in state-funded forest improvement work.

If the targets of the programme can be implemented in their proposed form, then the volume of the growing stock will increase by about 10 % and the annual increment by about 20 % by the year 2020 (Fig. 5). The growing stock will change from its present composition to one that is more pine dominated.

The fact that the cutting and timber production targets are also presented in the programme by area (by forestry board district) will presumably assist in the planning the implementation of the programme on a regional basis.

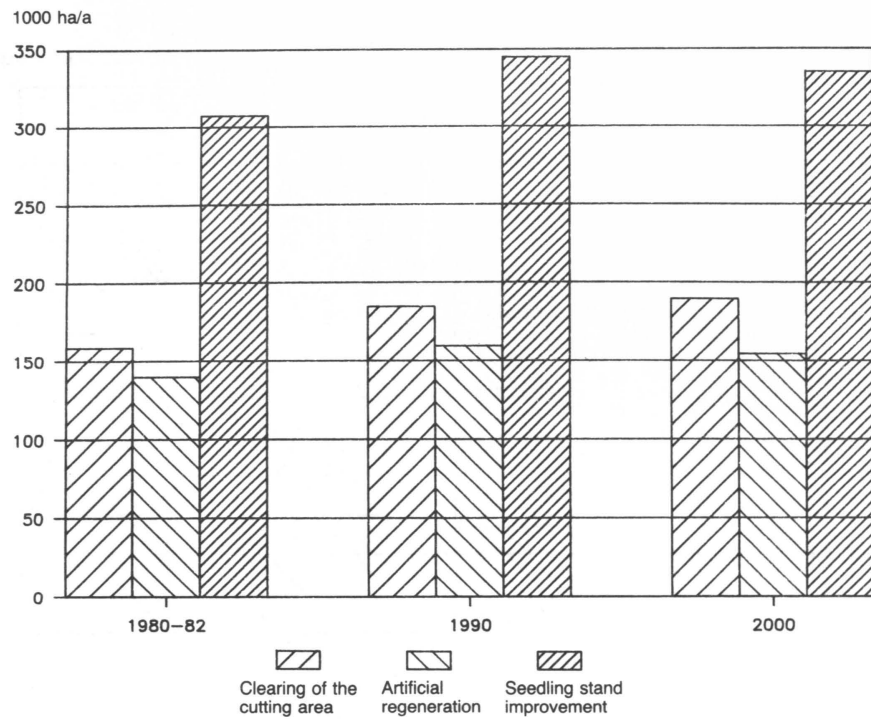


Fig. 3. The silvicultural targets of the Forest 2000 Programme. The need for silvicultural work will increase slightly from the present level.

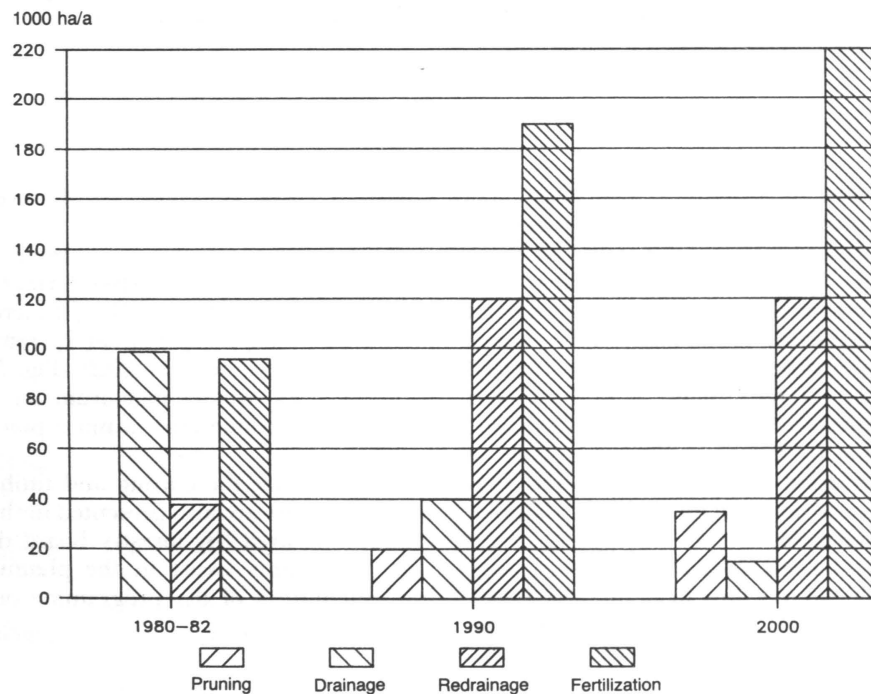


Fig. 4. The forest improvement targets of the Forest 2000 Programme. Drainage of new areas will fall sharply and, in practice, cease completely by the turn of the century. The need for redrainage will correspondingly increase. It is recommended that pruning of standing trees be made eligible for forest improvement funding. It is also recommended that the annual level of forest fertilization be increased to that prevailing at the beginning of the 1970's.

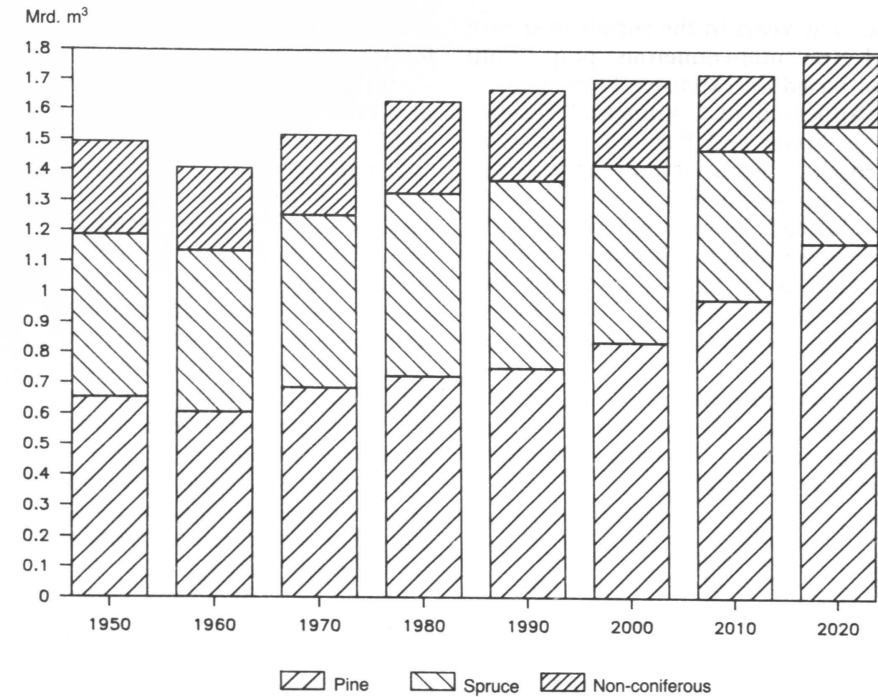


Fig. 5. Development of the growing stock volume. The cutting targets have been set at a level below the annual increment. This means that the growing stock volume will increase by 10 % from its present level by the year 2020. The proportion of pine in the growing stock will considerably increase.

## The development possibilities of the forest industries

The development possibilities of the forest industries up to the year 2000 are examined in the programme by taking the cutting targets as the starting points. The predictions indicate that the consumption of the most important groups of products will grow during the period 1980-2000 as follows:

Product group	Whole world	Western Europe
	Annual growth %	
Sawnwood	1.1 ... 1.5	-0.7 ... 0.7
Wood-based panels	2.2 ... 4.7	2.4 ... 4.6
Paper	3.3 ... 3.7	2.5 ... 2.8
Paperboard	2.8 ... 3.5	2.0 ... 2.8

According to these estimates, the total demand for forest industry products, weighted by the present structure of Finnish exports, will grow at a rate of about 3 % a year until the end of the century.

According to the targets of the programme, the raw material base of the forest industries will increase annually by 650 000 m<sup>3</sup>. Almost half of this amount will be large-sized spruce logs, and a third pine and non-coniferous cordwood. It appears that products based on kraft pulp will remain sufficiently competitive, consequently there will continue to be a demand for them in the future. A clear structural change has taken place in Europe dur-



ing the past few years in the supply of spruce sawnwood and non-coniferous pulp. Pulp production based on extensive forest plantations has appeared in Continental Europe, especially in Spain and Portugal. New sawmill capacity has also been built in Continental Europe. This production is, on the basis of its location, already more competitive on the European market than its Finnish equivalent. It is clear that in the coming years the Finnish forest industries will have to make greater investments in product development and marketing.

It can be assumed on the basis of past developments that the proposed cutting targets can be achieved as long as competitive production can be ensured:

	Implemented 1960-80	Forest 2000 1980-2000
	Annual growth %	
Forest industries		
- volume of production	+ 4.4	+2,6...+3.3
- wood consumption	+ 2.3	+1.2
- consumption of non-coniferous pulpwood	+11.2	+2.4
- consumption of large-sized spruce logs	+ 3.0	+2.5

Table 2. The development possibilities of the primary forest industries according to the Forest 2000 Programme.

Product group	Imple- mented 1980-82	Production possibilities in 2000			
		Alternative			
		I	II	III	IV
		1000 m <sup>3</sup> /a			
Coniferous sawnwood	8 522	11 900	10 600	9 500	8 500
- pine	5 106	5 700	5 700	5 700	5 700
- spruce	3 416	6 200	4 900	3 800	2 800
Plywood	613	770	770	770	770
Particle and fibreboard	970	1 000	1 000	1 000	1 000
		1000 mt/a			
Pulp	7 101	10 400	10 800	11 400	12 200
- mechanical	2 387	4 100	4 500	5 100	5 900
- chemical	4 714	6 300	6 300	6 300	6 300

Four development alternatives for the forest industries, which differ from each other with regard to the volume of the spruce logs used, are analysed in the programme. The results are presented in Table 2 and Fig. 6.

It appears that the raw material situation for the sawmill industry will remain satisfactory for the rest of the century. The production of pine sawnwood could be increased slightly compared to the level at the beginning of the 1980's, and that of spruce sawnwood considerably increased if the product is made competitive on the international markets. However, if the cutting targets are to be met, it will probably be necessary to direct an increasing proportion of large-sized spruce logs to the pulp industry, mainly for the production of mechanical pulp. This means that, of the presented alternatives, III and IV are the most realistic.

Owing to unfavourable competition in the market for particle and fibreboard, significant increases in the production of these products will be unlikely. The future production of plywood depends on whether the proportion of spruce in the product can be increased.

Growth in the forest industries will seemingly take place almost entirely in the pulp and paper industry. The potential annual

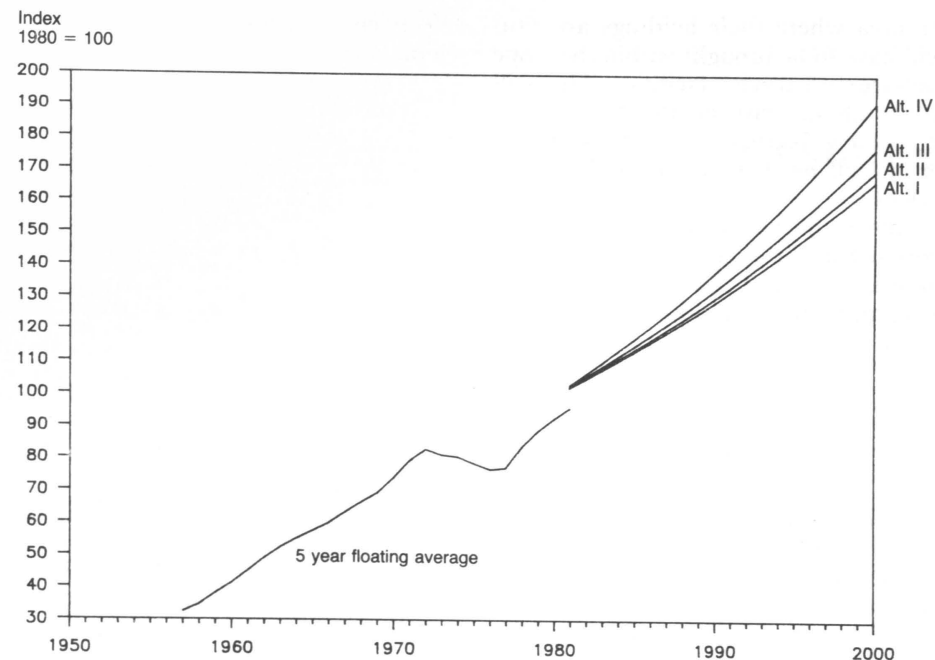


Fig. 6. The development prospects of the forest industry. The production volume of the forest industries as a whole can be increased by about 3 % a year. This corresponds to the estimated long-term increase in the demand for forest industry products.

growth in the production of pulp until the end of this century is 2-3 %, for chemical pulp 1.5 %, and for mechanical pulp 3-5 %. Production in the paper and paperboard industry could grow annually by 3.5-5 %.

According to the programme, the growth of the raw material base will permit a 3 % annual increase in the production of the forest

industries as a whole up until the end of the century. This would be the same as the target growth rate the GNP. However, the increased production presupposes that the functioning, competitiveness and raw material supply of the forest industries is maintained, and that their wood consumption structure is adapted to the structure of the cutting targets.

## The means available for achieving the targets

The targets of the programme are ambitious and demanding. The measures, as presented, will presumably not be enough. It will be necessary, therefore, to devise additional measures to supplement the programme while it is being carried out.

The most important of the means available for increasing timber supply are forestry

planning and an increase in the advice and services directed at the forest owners. By the beginning of the 1990's, individual forestry plans will have been drawn up for 90 % of the privately-owned forest area. Personal advisory services, and the execution of forestry plans, will have to be made more effective. All the forest owners, including those living out-

side the area where their holdings are situated, will have to be brought within the scope of the advice and service facilities. This will require a staff increase of about 50 in the district forestry boards, as well as in the number of staff needed by the local forestry associations.

Other means of increasing timber production proposed in the programme include the development of forest ownership, forestry legislature and forest taxation, increasing the

effectiveness of forest cooperation at the regional level, and improving the functioning of the roundwood markets. Active and constructive cooperation between the different interest groups is essential.

Economic, investment, energy and foreign trade policy, research and development work, and the effective marketing of wood-based products, all play a central role in strengthening the demand for timber.

## Monitoring and updating the programme

Social development and environmental conditions, such as acid precipitation, can bring about relatively rapid changes in forest management and in the forest ecosystem. It is also difficult to predict the activities of the forest owners and forest industries. Implementation of the programme must be monitored continuously, and its targets and choice of means checked at least every 5–10 years. The continuity of the necessary re-

search work, data systems and data registers, as well as development of the planning models, must be ensured. Since the Forest 2000 Programme is a long term project, it must be supplemented, at fairly short intervals (about 5 years), with a programme in which the targets and measures are scheduled annually, and which are checked and continued each year.