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Tom Wallden

STRUCTURAL CHANGES

AND FUTURE PROSPECTS

OF THE FINNISH FOREST INDUSTRIES*

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STRUCTURAL CHANGES AND FUTURE PROSPECTS OF THE FINNISH FOREST INDUSTRIES

By Tom Wallden, Lic.Pol.Sc., the Research Institute of the Finnish Economy (ETLA)

The long-term growth of world demand for forest industry products is predicted to exceed the growth in Finland's potential supply based on her own forest resources. This will eventually lead to a decline in Finland's market share unless the degree of processing can be raised sufficiently fast. The present report concentrates on the fundamental conditions necessary for raising the processing level¹⁾ of Finnish forest industry production: high quality raw material, research and development, technological know-how, changes in the productive structure, and marketing.

Structural change

Forests are Finland's most important source of renewable raw material. Utilization of this raw material has always played a focal role in our national economy. Finland is one of the most richly forested countries in the world. It has about 4.5 hectares of forest land per capita, which is almost four times the world average. The corresponding figure for Sweden is about 3 hectares and, for Canada, about 11 hectares. In addition, thanks to effective management, our forest land is more productive

1) The level of processing is defined as the proportion of value-added in gross output.

than the average. The total drain from our forests, consistent with the allowable cut based on sustained yield, is nearly 60 million m³ solid measure per annum. This wood raw material is almost in its entirety available to Finnish forest industries.

Our forests have also always constituted the most important source of raw material for our export industry. Although the proportion of exports and output accounted for by forest industries has decreased as a result of the diversification of industrial production, these industries still account for almost half of the value of total commodity exports and over a quarter of the gross value of industrial output.

Until quite recently, the expansion of Finnish forest industries has been based on the fairly strong growth of both domestic and international demand. Both output and the processing level in this sector have risen fast even by international standards.

In the mechanical forest industries degree of processing has risen slowly because of the nature of its production. In the case of sawn goods and plywood, the surface-treated, cut-to-size and packaged product represents the peak of the processing chain. The share of actual converted products, such as joinery and furniture, is today only a tenth of the value of the output of the branch.

In the Finnish chemical forest industries, there has been a faster shift in production and exports from pulp to paper products than in the world on average. Especially the share of printing and writing papers, which

represent a high degree of processing, and that of paper and board products have grown. In the production of chemical pulp, the share of sulphate pulp, representing a more diversified processing technique, has been increased, whereas that of sulphite pulp has gradually been reduced. The possibilities of further conversion of chemical pulp in the future must be regarded as small.

In the case of paper and board the raising of the processing level is slowed by the fact that the Finnish manufacturers have to compete with foreign producers of converted products. They are notable buyers of Finnish raw material and semi-manufactures. Exporters of converted products must be careful in these conditions not to jeopardise the markets for our less processed products which are exported in large quantities. This may mean relinquishing in the future a part of our own marketing opportunities unless vertical integration of production is extended within an international setting.

The demand prospects for forest industry products have weakened since the mid-1970s. In spite of this, the most recent non-commercial forecasts (FAO 1977) predict that world demand will in the long run exceed the supply possibilities based on the growth of our forest resources.

Domestic know-how has a central role to play in raising the degree of processing. The aim should be, in the future, to manufacture those traditional products in which the special properties of our high-grade timber can increasingly be utilized to advantage. Because the supply of our fibre material is limited, the centre of emphasis in developing the processing techniques, for instance, should lie in the research and

development of productive processes that are able to increase particularly the fibre yield. Then, in addition to the sulphate process, the thermomechanical and pressure-grinding processes will increasingly gain ground.

Technological progress¹⁾

The technological level of forest industries is quite high in Finland, and this is now the case even by international standards. The development of technology has made possible an increase in the unit size of paper and board machines. The roll width has grown and the roll rotation speeds have increased. The roll width of paper machines has been increased to 7-10 m, at the same time that the speed has risen to 600-1200 m/min. Increasing the output by raising speed is more economical compared with enlarging roll size. However, breaks in the web when running at high speeds constitute a problem. After this and other technical problems have been solved the maximum speed of a newsprint machine will rise to 1500-2000 m/min.

1) This section is based mainly on the following sources:

Jensen, Waldemar: Contribution to the session "Technology 2001" by CPPA Technical Section, 1974, Annual Meeting, January 29-February 1.

Appendix 1 to the final report of the analysis of the Section for Technical Development, the Technology Committee, March 1980.

Wallden, Tom: Suomen paperi- ja massateollisuuden tuotannon ja vionnin rakenne vuosina 1955-1975 sekä kehitysarvio vuoteen 1985, ETLA C15, second revised edition, Helsinki 1980.

The largest part of the production based on Finland's raw wood resources will also in the future consist of bulk and semi-bulk products. The trend in the paper industry may in the next few years be towards higher-grade printing and writing papers. The surface weight of newsprint will fall and the development of computerised composition will lead to increasing demand for offset paper.

In the case of other printing grades, the trend continues to be toward fibre-saving qualities in which the use of fillers (e.g. clay and talcum) and mechanical pulp increases. The use of mechanical pulp will increase because of its high yield. One problem, however, is the difficulty of developing process solutions that consume less energy. Growth in the consumption of newsprint is unlikely to be threatened so much by a shift to other printing and writing papers as by the growth of electronic communication. Through the development of i.a. the drying technique the paperboard industry has succeeded in developing higher-grade water-repellent qualities which permit versatile coating.

About 97 % of the dry-matter weight of wood is exploitable today in the production of groundwood pulp; in the semi-chemical method the corresponding proportion is 65-70 % and, in the chemical method, 45-55 %. In bleaching, however, the chemical pulp yields diminish by a couple of percentage points.

In pulp production, the centre of emphasis will be on research and development of productive methods leading to increased fibre yields, such as the thermomechanical production and soda-oxygen cooking techniques.

Moreover, the need to develop the environmental protection technology has led to an increasingly effective utilization of the waste liquor and, to the development of various by-products, including, in the sulphite industry, sulphite spirits, sulphite glue, yeast and a protein production method and, in sulphate industry, talloil and turpentine.

A break - through of automation has already taken place in the paper and pulp industry and the degree of paper machine automation in Finland is 75 %, a figure which high by international standards, too. It is estimated that about 90 % automation will be achieved in paper machines by the end of the 1980s. There is still scope for further applications of automation in the mechanical forest industry.

The Finnish forest industries have developed a high level of know-how. However, its utilization in Finland's own forest industries can only be extended within very narrow limits. Therefore the marketing of this technology and know-how is a natural line of development for our forest industries.

Future prospects²⁾

The demand for forest industry products depends in the short run primarily on changes in the economic situation in our market areas. In the longer

1) This section is based primarily on the following sources:

Seppälä, Kuuluvainen, Seppälä: Suomen metsäsektori tienhaarassa. Folia Forestalia 434, the Finnish Forest Research Institute, Helsinki 1980.

Wallden 1980, ibid.

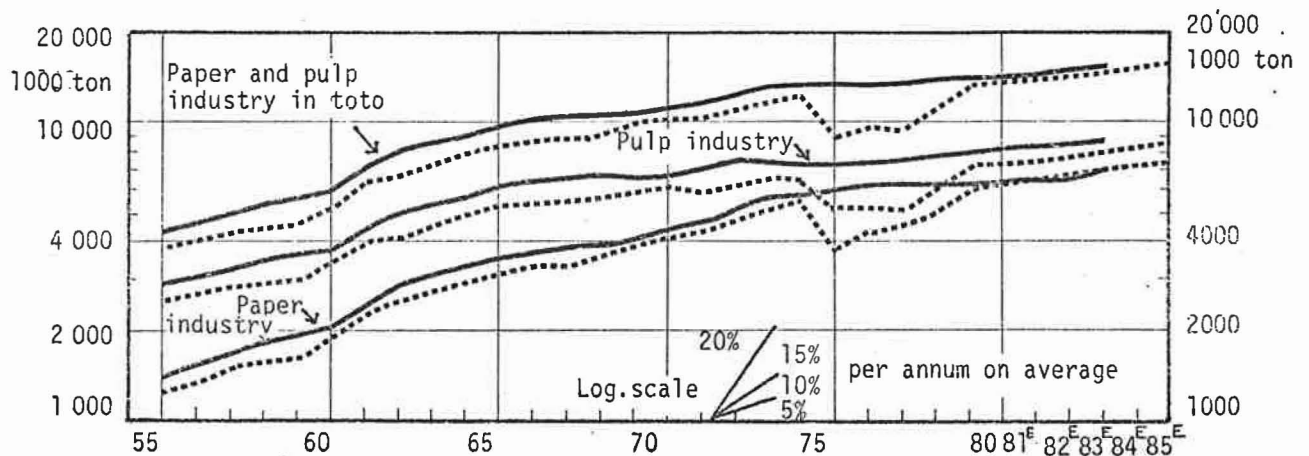
run it is affected by the rise in the general level of prosperity, the relative prices of substitutes and the advance of technology.

Medium term

The assessment of the medium-term outlook is based mainly on information on the present level of productive capacity, on known enlargement projects and on international demand prospects.

Fig. 1 shows the output and capacity of the chemical forest industry between 1955 and 1980, and its predicted course up to 1985. With the rise in the processing level the growth curve of paper industry production has risen since the early 1960s more steeply than that of the pulp industry, and this trend is expected to persist.

Fig. 1. Output and capacity of the paper and pulp industries in 1955-1980 and their predicted course up to 1985, 1000 tons



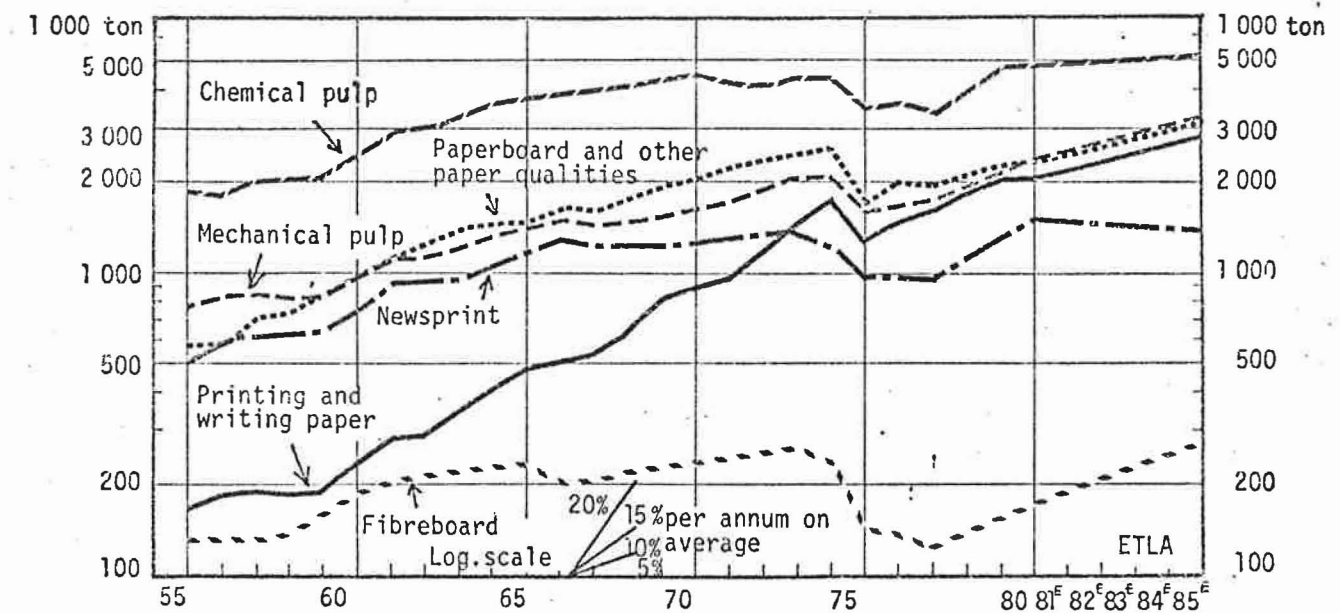
———— capacity

----- output

Source: Wallden 1980, *ibid.*

In Fig. 2 the above output forecast for chemical and mechanical pulp is subdivided into groups of more highly processed products. An especially noteworthy feature is again the faster output growth prognosis for paperboard and other paper qualities (incl. converted products) than for other products.

Fig. 2. Output of chemical pulp, mechanical pulp, fibreboard, newsprint, printing and writing paper, paperboard and other paper qualities in 1955-1980 and their predicted course up to 1985, 1000 tons

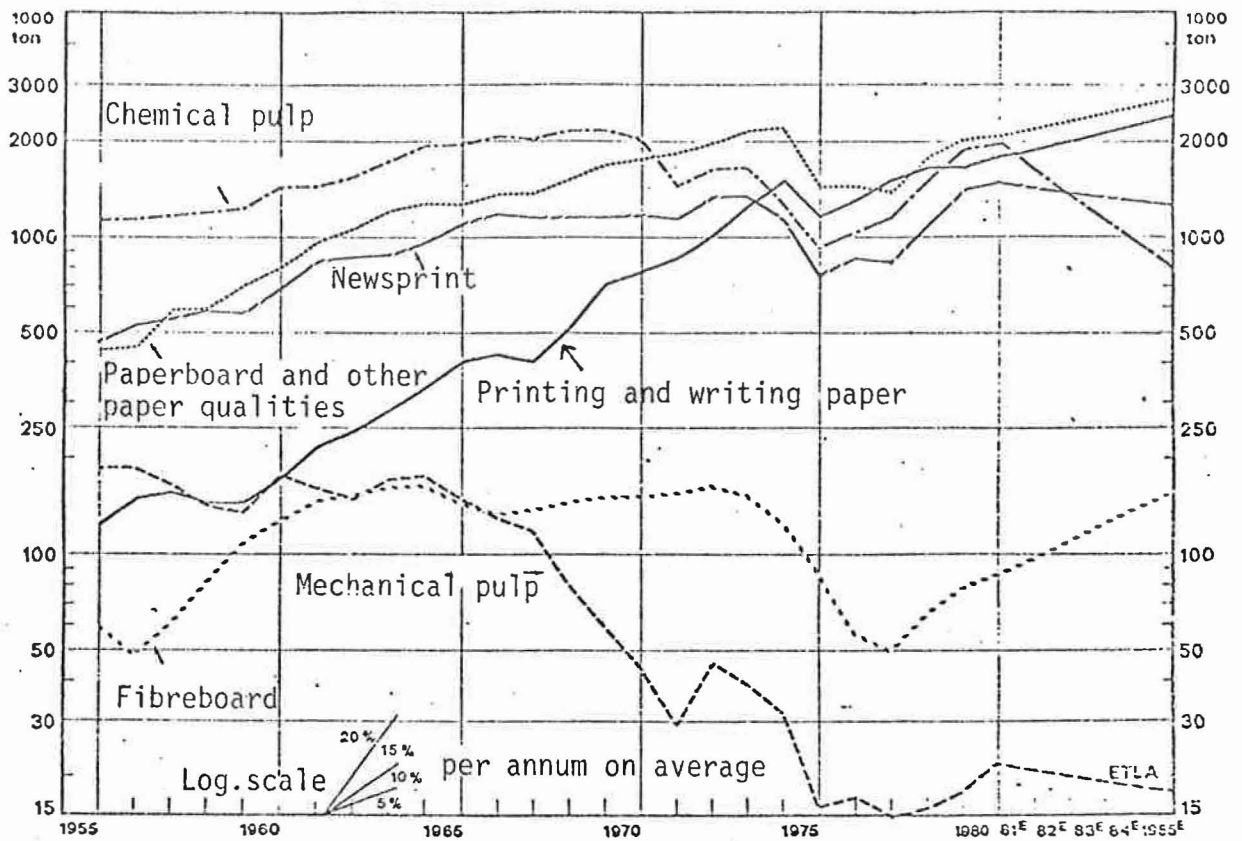


Source: Wallden 1980, *ibid.*

Fig. 3 represents forecasts for Finnish chemical forest industry exports based on production potential data and on international demand forecasts.

The trend shown by output is, of course, reflected in exports. However, chemical pulp exports will distinctly shrink with the rising degree of processing.

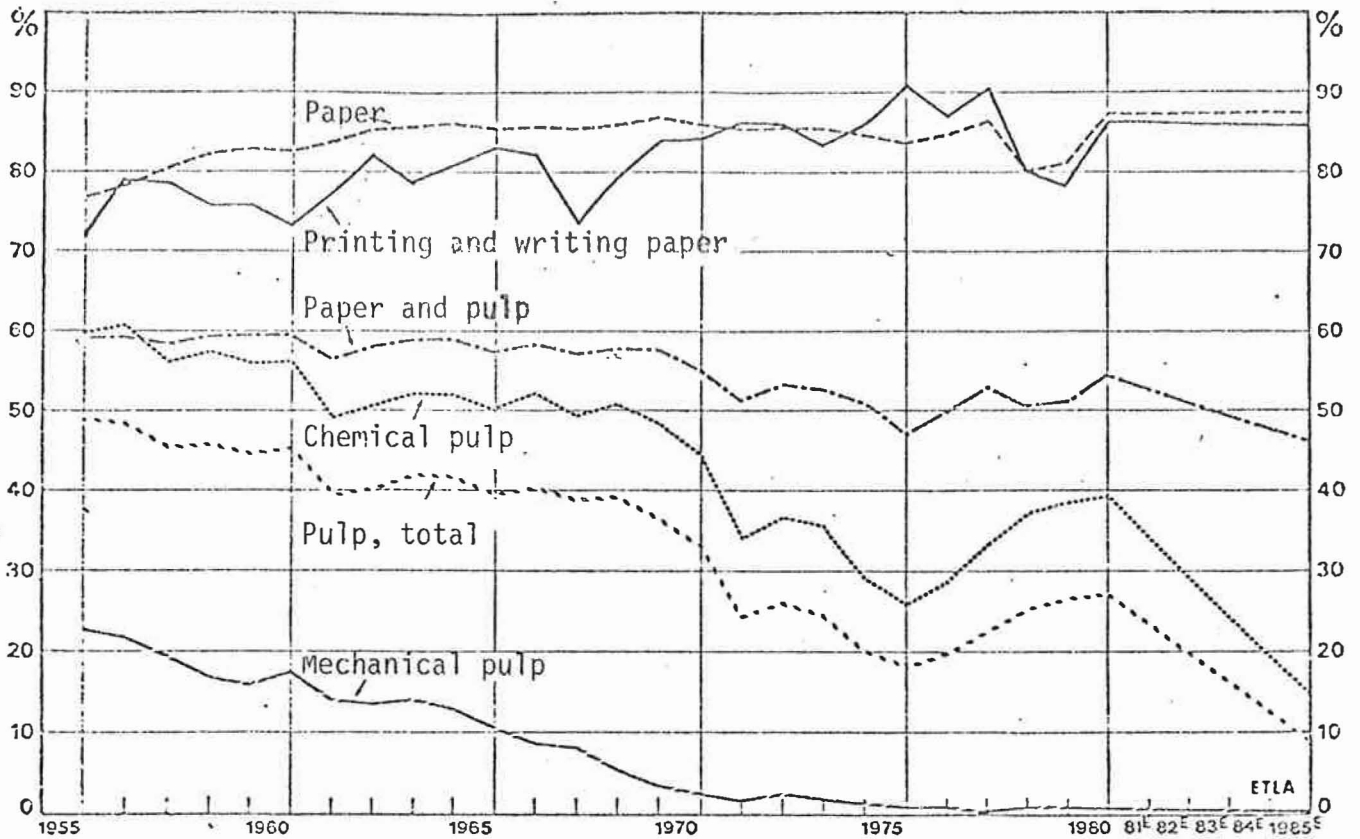
Fig. 3. Exports of chemical pulp, mechanical pulp, fibreboard, newsprint, printing and writing paper, and paperboard and other paper qualities in 1955-1980 and their predicted course up to 1985, 1000 tons



Source: Wallden 1980, *ibid.*

Fig. 4 predicts the percentage shares absorbed by exports of the output of the main product groups of the chemical forest industry in 1985. It is clearly apparent that within this time interval Finnish pulp production will already be utilised increasingly for domestic conversion purposes.

Fig. 4. Proportions of paper and pulp production absorbed by exports in 1955-1980 and their predicted course up to 1985, %



Source: Wallden 1980, *ibid.*

Long term

In physical terms, the Finnish forest industry production will in the long run grow approximately in step with the average annual growth of our forest resources. As a result of the rise in the processing level, however, growth in the output volume will be slightly faster than this.

The line to be followed by Finnish forest industries will increasingly be based on the utilisation of the comparative advantages they enjoy in goods production and know-how. The transition to a period of slower

growth is likely to speed up the rise in the processing level, for the scope for growth of basic production will then diminish.

In the future, the printing industry has to be increasingly clearly seen as a branch of the forest industries. The gross value of output in the printing and publishing sector is a fifth of that of the paper and pulp industry, whereas the value of its exports is only a tenth of the value of exports of paper and pulp industry products. Our customer countries' own industries, at the same time as they are buyers of our bulk products, have to be considered the most serious competitors of our chemical forest industry as regards its converted products. Growth in the demand for paper products is due mainly to the demand for high-grade qualities and, because of the advance of technology, to special paper qualities.

Geographical distance hampers exports of converted products less than exports of bulk products, since transport costs form only a small fraction of the export prices of the former. Of greater significance is likely to be the fact that the buyers of converted goods often regard prompt and precise delivery, and not infrequently, delivery in small quantities as desirable. An effort should be made to eliminate these comparative disadvantages through re-organising marketing and distribution and through resorting to international vertical integration of production.

Sales associations have had quite an important role to play in the marketing of basic products. The increase in the output and exports of converted products will, however, require a more flexible

approach to the consumers' needs. This presupposes direct producer-client contacts. Increasing investment in independent sales promotion and internationalisation is likely to reduce the significance of sales associations in the future.

The stepped-up internationalisation of the Finnish forest industries is an indication of the increasingly serious efforts made by this sector to eliminate its comparative disadvantages. It provides at the same time an opportunity to gain the best market information possible and, thus, to utilize the technological know-how in the sector in the best way possible.

The growing stock of our forests is our most important natural resource. This is why forestry and forest industries have been pursued in Finland for several generations. Indeed, we have accumulated know-how of world-wide importance in these branches. However, in Finland the opportunities to apply this know-how have been limited. In fact, broad international use has been made of our expertise. Exports of this know-how also offer a means of adjustment to changing economic situations.