

# Analysis of Estonian Forest Industry Enterprises – the Case Study

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Kaimre P., Muiste P., Teder M. 2001. Analysis of Estonian Forest Industry Enterprises – the Case Study. *Baltic Forestry*, 7 (2): 50–56.

The paper describes the study in which the use of resources by forest industry enterprises and problems concerning the development of forest industry were analysed. The study was compiled for the Estonian Forestry Development Programme for the purpose of providing relevant background information. The questionnaire was prepared and survey carried out. A total of 65 responses were got from the forest industry enterprises and forest districts. The results of survey dealing with use of production resources by enterprises and their economic performance are presented. The relative use of timber assortments is described and a comparison of the forest resources available in Estonian forests is made. The assessments and expectations of entrepreneurs about timber markets are presented. Availability of adequate information, long-term planning and promotion of private forestry seem to be key-factors for development of Estonian forest sector.

**Key words:** forest industry enterprise, logging enterprise, forest district, production resources, timber market, Forestry Development Programme

## Introduction

Forest industry is one of the important branches of Estonian economy, giving 17 % of the industrial production and being the biggest equaliser of the trade balance. Estonian forest resources (2.06 million ha; 353 million m<sup>3</sup>) create favourable preconditions for the further development of the forest industry. During the formulation of the Forestry Development Programme (1999-2001) the most essential goal set for the forest industry was the maximization of timber value.

The goal of the present study was to evaluate the situation in the forest industry sector by questioning the enterprises and make proposals in order to favour the development of forest industry. The study itself had to give basic data concerning the working out of the national forest policy in forest industry. Describing the sector by experts or carrying out the basic studies usually precedes the formulating of forest policy in different countries (Krott *et al* 2000, Reunala *et al* 2000). Carrying out the basic studies by the research institutions gives a more objective picture about the situation than expert opinions, therefore, such an approach was preferred in working out the Estonian Forestry Development Programme. Several studies describing the situation in forestry and pre-

senting the development scenarios of forest industry (Eesti TA Majanduse Instituut 1990, CTS Consulting OY 1992, PW Partners 1999) have been compiled in Estonia in the 1990s.

In the present study the following areas deserved the main interest:

- Using resources in forest industry;
- Problems in timber market ( e.g. certification );
- Economic variables of enterprises and planned investments;
- The relation of main and incidental output and waste, using timber waste;
- The availability of information (among this the development of the European Union);
- Using labour and the need for labour in forestry;
- The evaluation of forestry education by the employers.

Some of the above-mentioned areas were treated thoroughly, some of them only superficially. The researchers tried to get the information concerning forest industry to observe the changes in problems in the 1990s. In the present paper only a part of the study results are presented focusing on questions connected with raw material, timber market and economic variables of enterprises.

**Material and methods**

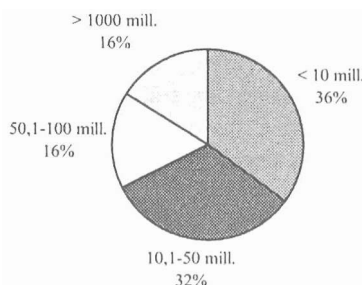
In the research the information was collected both from forest industry enterprises and forest districts. The enterprises of forest industry were considered these ones where the most important raw material used is timber or these enterprises have to be engaged in logging, felling and timber transport. The data were gleaned about all the branches of forest industry to evaluate the situation in this sector. The basis of compiling the study were the results of the questionnaires carried out among the work managers, statistical data and previous studies and analysis. Questionnaire was compiled and carried out in order to get the useful information. The answers from forest districts were got by mail, in timber processing and logging enterprises the executives were interviewed on-site.

The database containing the data of 1300 enterprises presented to the register of companies was the ground of making the sample. All the enterprises in database marked silviculture, logging, timber marketing or timber processing one of their primary activities.

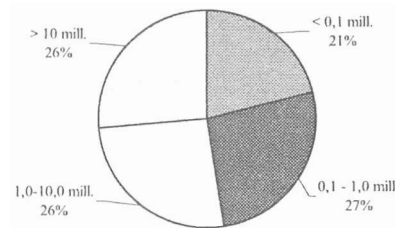
Enterprises were chosen in the list of timber processing enterprises in a way that all the counties, different operating areas of forest industry, and besides the so-called market leaders and well-known enterprises, the enterprises with small turnover and number of workers were also represented. Thus the directed choice was used. The answers were got from 65 enterprises, distributed in the following way:

- 37 timber processing enterprises with the total turnover of 2.7 billion kroons in 1999, making 17.3 % of the turnover of all the timber processing enterprises;
- 19 logging enterprises with the total turnover of 137 million kroons in 1999;
- 9 forest districts with the total turnover of 103.7 million kroons in 1999, making 13.7 % of the whole turnover of the State Forest Management Centre.

Figures 1 and 2 represent the division of timber processing and logging enterprises in present sample according to the turnover.



**Figure 1.** The division of timber processing enterprises in sample according to the turnover in 1999



**Figure 2.** The division of logging enterprises in sample according to the turnover in 1999

**Results and discussion**

*The bottlenecks of development*

The main research topic was questions connected with the resources used in forest industry. It is known from the previous studies that in the middle of the 1990s the most complicated problem for timber processing industries was financing (Ministry of Economic Affairs/EU Phare 1995). Based on the study carried out in 1999 the conclusion was, that only a few resources were headed in merchandising and for R&D (PW Partners 1999). The problem concerning the lack of raw material was more often discussed in public in the second half of the year 2000. It was considered essential in the present research to explain the areas regarded critical by the works managers in the development process.

The employers were asked in the questionnaire to evaluate the actuality of problems concerning the obtaining of production factors. Mark "0" means no problems and mark "5" means that problems are great. The results are presented in Table 1.

**Table 1.** Evaluation to the problems concerning production

	Timber processing companies	Logging companies	Forest districts
Raw-material (timber)	3.00		
Labour	2.52	3.00	2.57
Equipment and technologies		0.25	1.75
Finances and financing	1.89	2.44	1.57

The biggest problem for manufacturing industry is the supplying with raw material. The reason can be the volume of investments in timber industry, which in the period 1995-2000 was remarkable ca. 1.5 billion kroons. Increasing production volumes have raised the

demand for timber at the level where the supply with certain assortment was not sufficient.

The problems connected with labour are essential for all the three samples. The whole Estonian economy faces the antagonistic problem. On the one hand, unemployment (rate of unemployment in 2000 in the first quarter was 14.2%), on the other hand the absentees and shortage of skilled labour. In the middle of the 1990's financing was the problem for the enterprises, but now the situation has changed. Thus, the mark describing financing is expected: forest districts finance its activities from timber sale incomes, somewhat complicated is the financing in suitable conditions for logging enterprises with small capital and turnover, as compared to the timber processing enterprises.

*Use of timber*

From the point of view of sustainable forestry the balance between the possible cutting volume and real timber use is essential. The environmentalists criticise forest officials and forest policy of being too liberal in increasing the cutting volumes in Estonia. The assortment of timber used by enterprises and relations of these assortments in timber market were analysed in the study. Table 2 presents the distribution of timber use by enterprises according to assortment.

**Table 2.** Use of different assortments by enterprises

Assortment	Share %
Spruce logs	45.7
Spruce logs less than 18 cm ub	13.3
Pine logs	13.2
Pine logs less than 18 cm ub	18.3
Birch logs	8.3
Aspen logs	0.5
Alder logs	0.3
Other assortments	0.4
Total	100

Table 3 enables us to compare Estonian forest resources conformably to its species.

Spruce has got unexpectedly big share in timber use by enterprises (Tables 2 and 4). It might be so due to the good quality of spruce (e.g. compared to pine) and hence the better competitiveness of production in foreign market. Higher price of spruce logs compared with pine in Estonian timber market is the result of interaction between the supply and demand. The reason is also that a technological process in softwood processing is easier than in the case of deciduous timber. While beginning their activities saw mills at first concentrated on softwood processing.

**Table 3.** Forest resources in Estonia in 1999

Forest and other wooded land, thousand ha	2 143.1
stands	2 059.0
pine	793.6
spruce	453.1
birch	600.8
aspen	50.6
Black alder	34.4
Grey alder	107.9
other	18.6
Reserve of stands, million m <sup>3</sup> s	352.7
pine	139.5
spruce	82.1
birch	96.1
aspen	11.2
Black alder	5.8
Grey alder	15.5
other	2.5
Average volume per hectare, m <sup>3</sup> s	171.3
Percentage of territory covered by forest	47.4

Source: Estonian Forest Survey Centre

**Table 4.** Comparison of study results and the estimation of Estonian log distribution by species (Estonian Forestry Development Programme 1997)

Species	Estimation		Use by enterprises	Relative difference
	Logs mill. m <sup>3</sup>	Share %	Share %	%
Pine	0.7	25.0	31.5	+6,5
Spruce	1.3	46.4	59.0	+12,6
Birch	0.6	21.4	8.3	-13,1
Aspen	0.1	3.6	0.5	-3,1
Black alder	0.1	3.6	0.3	-3,3
Other			0.4	+0,4
<b>Total</b>	<b>2.8</b>	<b>100</b>	<b>100</b>	

Timber processing enterprises plan their investments and production structure according to the existing resources. As the use of softwood has gained maximum possible level responding to the sustainable forestry, it can be predicted that next large-scale investments will be done in processing deciduous timber. Enterprises using softwood and practising mechanical processing might be reconstructed, new investments or creating extra capacity would give the negative potential to supplies.

*Timber procurement and relations on timber market*

In the Estonian Forestry Development programme in 1995-1997 a lot of attention was given to finding

solutions in selling timber from state forests. The purpose was to find a solution giving the best result in considering the whole market. Several pure research works were carried out and later on special juridical acts prepared. The timber procurement preferences of forest industry enterprises and present partnership with timber sellers through the eyes of these enterprises were tried to explain in the study.

Enterprises with large turnovers having also logging capacities prefer to buy wood at stumpage in procurement (Figure 3). It enables to implement the use of just-in-time inventory system in procurement. Enterprises specialising only timber processing prefer long-term contracts (Figure 4), which guarantees the getting of raw material in longer period and consequently the stability of the whole production.

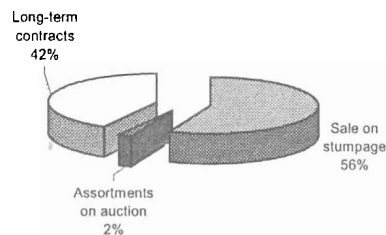


Figure 3. Preferences of timber processing enterprises in procurement (according to turnover)

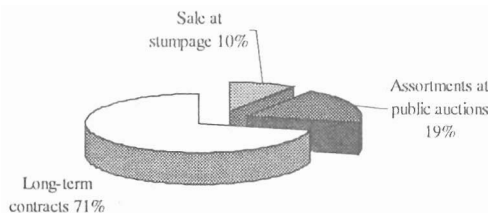


Figure 4. Preferences of timber processing companies regarding timber procurement schemes (by number of enterprises)

Enterprises answering questionnaires used 84.6% of local timber and 15.4% of imported timber of their whole raw material. The similar situation is in Finland, where enterprises of forest industry import 15% of used raw material (Reunala *et al* 1999).

According to the official statistics more timber is imported year-by-year by the Estonian enterprises. Although a part of it is re-exported, it still compensates the deficit of raw material of timber processing enterprises.

Table 5. Imports of wood and articles of wood, 1995–1999 (in millions of kroons)

Commodity	1995	1996	1997	1998	1999
Wood and articles of wood, total*	449.3	572.3	829.3	1116.6	1185.4
wood in the rough	22.1	40.1	65.7	167.7	228.8
firewood	627.8	2.9	10.7	3.5	6.1
hoopwood	0.1	0.1	0.0	0.4	0.9
railway or tramway wooden sleepers	9.9	15.4	12.2	26.9	31.9
charcoal	0.3	0.9	0.9	1.7	1.5
Wooden furniture Prefabricated	179.8	255.2	351.0	354.0	298.6
wooden buildings	3.1	6.3	5.6	12.9	14.6

\*Excl. wooden furniture and prefabricated wooden buildings.

According to the Statistical Office timber and timber products were exported in value of 1.5 billion kroons in 1999. The import of logs and timber products makes up 2% of the total import. Mostly wooden furniture (20%), plywood (18%) and rough timber (15%) were exported. A total of 397 thousand m<sup>3</sup> were imported and at the same time 3.76 million m<sup>3</sup> exported in 1999.

Expectations about demand for timber

Nobody of the 65 respondents answered that the demand for timber or timber products decreases within five years. It was considered to a less extent that the demand would remain at the same level, but mostly was thought that it would increase (Table 6). The increase in demand is more recognised by loggers (this might be connected with the present situation in the timber market).

Answers	Timber processing enterprises	Logging enterprises	Forest districts	Total
same	29,4%	23,5%	28,6%	27,6%
decreases	0,0%	0,0%	0,0%	0,0%
increases	70,6%	76,5%	71,4%	72,4%

Table 6. The demand for timber and timber products in next five years

Co-operation in the forest sector

The following question was asked from timber enterprises as the buyers: Which partner would you prefer as far as possible? The enterprises answered in the following way:

Partner	Yes, we do prefer
State Forest Management Centre	51%
Private forest owner	19%
The unions of private forest owners	19%
Timber agents	16%

The preferred partners are state forest managers, although the division of yes-no answers is relatively equal. Therefore, the results should give certain thoughts for private forest owners and their organizations, but also for the designers of forest policy. More than half of the forest resources in Estonia will belong to the private owners (approximately 54000 forest owners), but today they are inconvenient partners to the sector of forest industry. Relatively negative evaluation regarding partners refers to the need of making essential efforts to develop partnership relations of private forest owners and forest owner organizations.

In countries where private forest ownership dominates the problems connected with overbalanced timber market has been an issue for decades. The situation has run to a point within the last decade during the concentration of forest industry. In timber market, the buyers are big international companies, but seller forest owners having only a few dozen hectares of forest area. The latter are in a worse situation compared to the companies with certain experiences, knowledge and information. On one side the powerful professionals, on the other side amateurs. Usually private forest owners criticise (non) functioning of market, but present study has revealed that enterprises feel dissatisfaction because of the current situation (although in Estonia the organizations are not so big and concentration not at the same level as in Nordic countries).

*Market regulations*

Achieving free market economy has been one basis of development in Estonia in the transition period. The state has tried to minimise its regulative role in economy. While comparing all the three Baltic countries - Lithuania, Latvia and Estonia, it seems that in Estonia the relations in timber market are less regulated. The opinion of enterprises about the functioning of market and the need to regulate/ liberalise it were tried to get to know. The answers are presented in Table 7.

	Satisfied	Necessity to liberalise	Necessity to regulate	Do not know
Enterprises	56.8	0.0	18.9	24.3
Loggers	26.3	10.5	63.2	0.0
Forest districts	33.3	11.1	44.4	11.1
TOTAL	44.6	4.6	35.4	15.4

**Table 7.** Estimation of market functioning (distribution of answers in %)

The results have to be interpreted in a way that regulating does not imply retreat from market principles and establishing new planning committee, but it means that forestry needs long-term planning, as the medium-term planning is insufficient.

Considering the sustainable development of the sector, public information is needed about the resources, forest management planning, public financing of forest counselling and other activities, not only supporting the interests of certain stakeholders but the development of the whole forestry.

*Economic indicators of forest industries*

Net turnover of enterprises has successfully increased over the last years. Especially successful was the growth between 1998-1999, making up 30 % per year in current prices.

In the current year the growth compared to previous years is moderate but still accountable.

Year	Changes in %s compared to previous year	
	Timber processing	Logging
1998	28.7	17.2
1999	32.0	32.0
2000	16.5	18.2

**Table 8.** The change in turnover in current prices of logging and timber processing companies represented in sample

Official statistics also affirms rapid growth of production volumes:

Year	Production by timber processing enterprises (million kroons)	Change %
1995	1743	
1996	2054	+21
1997	3348	+63
1998	4020	+20
1999	4703	+17

**Table 9.** Industrial production in current prices

Source: Statistical Office of Estonia, 2001

Different indicators can estimate earning capacities. In the present study net profit margin of turnover expresses the relationship in per cent between net profit and turnover. In 1999 according to economic indicators of enterprises presented in the sample, net profit margin of turnover was the following:

- Enterprises of timber processing 6.5%
- Logging enterprises 4.1%

The result is very good, especially in comparing the indicator with the medium indicator of Estonian processing industry, which in 1999 was 0.98%. The corresponding indicator of membership enterprises of the Federation of Estonian Forest Industries was 1.4% in 1999. The result might be influenced by the fact that more successful enterprises got into the sample and more successful enterprises compared to the average agreed to answer the questionnaire. Net profit margins

of turnover in forest industry companies of other countries during the 1990s are presented as a comparison.

• Finland	4.3%
• Sweden	6.3%
• USA	3.1%
Canada	0.6%

Source: Reunala *et al.* 1999.

Therefore, it can be said that forest industry has gained economically good and competitive results also at the international level. The effectiveness of means invested in forest industry is competitive, as compared to other branches of economy.

## Conclusions

The research tried to make clear the problems facing enterprises. The study has revealed that the main problems are procurement of raw material and labour. But the proposals of solving the problems cannot be obtained from the enterprise. The Forestry Development Programme now compiled for Estonian forestry and ordering present study, have made an attempt to find solutions in planning future activities by using experts help and participation democracy of stakeholders.

Potential cutting volumes are followed in forming the production structures of timber processing enterprises also taking into consideration the assortment structure. But still the level has been achieved in Estonia in softwood processing, where the demand starts exceeding the amount of raw material got from forest, creating procurement difficulties in certain periods (especially in autumn) and rising prices of logs. Getting and offering actual information about timber resources and dynamics of timber usage enable us to avoid future tensions.

Analysing the research from the methodological point of view raises the question: Is the opinion of enterprise managers sufficient in making certain conclusions or should the research rely only on the quantitative and objective information?

In some parts of the research the results differed from the data of Statistical Office in describing the sector. Hence the question about the needed size of the sample being valid and enabling to draw generalization about the whole sector. The data of the Statistical Office should be treated critically also, because it considers indicators of the enterprises of more than 50 workers, but in most timber processing enterprises the number of workers is smaller.

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Received 06 September 2001

## АНАЛИЗ ЭСТОНСКОГО ЛЕСОПРОМЫШЛЕННОГО СЕКТОРА

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*Резюме*

Статья даёт обзор об использовании лесных ресурсов в предприятиях Эстонской лесной промышленности, а также о проблемах развития сектора. Анализ был проведён по заказу проекта «План развития Эстонского лесного хозяйства» с целью сбора данных для разработки плана. На проведённый опрос были получены ответы из 65 предприятий и лесничеств. В статье представлены результаты опроса и проведенного анализа. Проведено сравнение Эстонских лесных ресурсов и использования древесного сырья в деревообрабатывающих предприятиях. На базе оценки делаются выводы, что ключевыми вопросами являются доступ к достоверной информации, долгосрочное планирование и развитие организационной структуры частной лесной собственности.

**Ключевые слова:** лесопромышленное предприятие, лесообрабатывающее предприятие, лесничество, ресурсы производства, рынок лесоматериалов, План развития Эстонского лесного хозяйства