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**ROUNDWOOD MARKETS  
IN THE BALTIC SEA REGION**

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**Helsinki 2004**

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## **FOREWORD**

The import of wood from the Baltic Sea states by Finnish forest industry companies increased during the 1990s. At the beginning of the 1990s the volume of wood imports was 5-6 million cubic metres, but in 2002 it reached almost 16 million cubic metres. In addition to importing wood, forest industry companies have already invested in the Baltic Sea states and plan to continue investments in the future. The current plans include sawmilling investments in Russia and the Baltic States, and investment in a pulpmill in Latvia.

In 2001, as a result of the development in the 1990s, a three-year research project was started on "The economic effects of roundwood import and Baltic Sea roundwood markets" by Pellervo Economic Research Institute and the Finnish Forest Research Institute. The aim of this research project was to describe the effects of roundwood imports on Finnish roundwood markets, employment and income. In addition, the research gathered information on forest resources, the intensity of utilisation of forest resources, roundwood market functioning and forest industry production in the Baltic Sea area.

This report examines the forest sector development from 1995-2001 in the Baltic Sea area. The main information sources included Eurostat, the FAO and national forest statistics. In addition, experts in the international roundwood trade were interviewed. We especially thank Managing Director Kalevi Mikkonen (Mets and Puu) and Director Juhani Hongisto (Metsäliitto). Sincere thanks are also due to the experts in the research projects background group. This research was conducted in co-operation with researcher Sten-Gunnar Skutin from Skogforsk, the Forestry Research Institute of Sweden. Special thanks are due also to Research Director Lennart Rådström (Skogforsk). This study was partly financed by the Finnish Ministry of Agriculture and Forestry, which the institutes are thankful.

Helsinki, February 2004

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**Abstract:** The aim of this study was to describe the forest resources of the Baltic Sea area, the utilisation of the forest resources, the forest ownership structure, roundwood markets and tradeflows and the forest industry. The most significant under utilised forest resources in the Baltic Sea area are situated in Germany and in Northwest Russia. Possibilities to increase roundwood production in Germany are small because the forests have other important values in addition to roundwood production, and the price of wood is quite high. A considerable increase in roundwood production is possible mainly in Northwest Russia. However, in Estonia and Latvia roundwood production could even decline in the future because the roundwood production level exceeds the net annual increment of the forests.

The structure of roundwood markets differs between the Baltic Sea countries. In Finland and Sweden a major share of forests belongs to non-industrial forest owners. In Russia, Poland and Germany the state and other communities are the main forest owner groups. The structure of forest ownership in the Baltic states has developed in the same direction as in Finland and Sweden because of the process of returning and privatising forests.

Roundwood and forest industry production have increased in the Baltic Sea region since 1995. In Finland and Sweden the increase in forest industry production has mostly been based on imported wood. Finland has imported the wood mainly from Russia, and Sweden from Russia and the Baltic states. In the future the increase in forest industry production is likely to occur primarily in the Baltic states and Russia and the relative importance of Finland and Sweden as forest industry producers will thus decline somewhat.

**Keywords:** *Baltic Sea, roundwood markets, forest resources, forest industry*

**Tapio Tilli – Sten-Gunnar Skutin 2004. ITÄMEREN ALUEEN RAAKA-PUUMARKKINAT.** Pellervon taloudellisen tutkimuslaitoksen raportteja n:o 188. 54 s. ISBN 952-5299-74-0, ISSN1456-3215

**Tiivistelmä:** Tutkimuksessa tarkasteltiin Itämeren alueen maiden metsävaroja, metsävarojen käytön intensiteettiä, metsänomistuksen rakennetta, puumarkkinoiden toimintaa, puun kulkuvirtoja ja metsäteollisuuden tuotantoa. Itämeren alueen merkittävimmät käyttämättömät puuvarat sijaitsevat Saksassa ja Luoteis-Venäjän alueella. Saksassa hakkuiden kasvua hidastaa metsien muiden kuin puuntuotannollisten arvojen korostuminen ja puun korkea hinta. Itämeren alueella puuntuotannon merkittävä kasvu onkin mahdollista lähinnä Luoteis-Venäjällä. Virossa ja Latviassa hakkut voivat jopa tulevaisuudessa alentua hakkuiden ylittäässä tällä hetkellä puiston nettokasvun.

Puumarkkinoiden rakenne eroaa Itämeren alueen maissa. Suomessa ja Ruotsissa metsien yksityisomistuksella on suuri merkitys. Sen sijaan Venäjällä, Puolassa ja Saksassa valtio ja muut yhteisöt omistavat suurimman osan metsistä. Baltian maissa metsänomistuksen rakenne kehittyi metsien palautus- ja yksityistämisprosessin seurauksena lähemmäs pohjoismaista rakennetta

Puiston hakkut ja metsäteollisuuden tuotanto ovat kasvaneet Itämeren alueella vuoden 1995 jälkeen. Suomessa ja Ruotsissa tuotannon kasvu on perustunut merkittäväältä osin tuontipuuhun. Suomi on tuonut puuta lähinnä Venäjältä ja Ruotsi Venäjän lisäksi myös Baltian maista. Tulevaisuudessa metsäteollisuuden tuotannon kasvun painopiste tulee olemaan Baltian maissa ja Venäjällä, jolloin Suomen ja Ruotsin suhteellinen merkitys Itämeren metsäsektorilla alenee.

**Avainsanat:** Itämeri, puumarkkinat, puuvarat, metsäsektori, metsäteollisuus



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## **1. INTRODUCTION**

In the Baltic Sea region, historically remarkable development took place at the beginning of the 1990s. The Soviet Union collapsed and four independent countries were born around the Baltic Sea: Russia, Estonia, Latvia and Lithuania. In addition, the socialist economy ended both in the old Soviet Union area and in Poland. Furthermore, East and West Germany reunited to form a new Germany on the south side of Baltic Sea.

Independence and new economic systems caused a deep crisis in the old socialist countries. The economic situation after the socialist period was clearly weaker than that in the western countries. Foreign trade had mostly taken place between the socialist countries, but trade partners now also had to be found from the west. Industrial products were in many cases of poorer quality than in western countries, which caused difficulties in penetrating the foreign market. Many factories were also in bad condition and their technology was out of date.

After independence, Estonia, Latvia and Lithuania decided to return the property that had been nationalised at the end of the 1930s to the original owners or their heirs. This meant the start of private forest ownership in these countries. In the former East Germany the forests were also returned to their former owners. However, in Russia all forests remained state owned.

This paper examines what has happened in the forest sector of the Baltic Sea region since 1995. It evaluates the forest resources in the new countries as compared to those in Finland, Sweden, Germany and Poland. We are also interested in the intensity of forest resource use in the Baltic Sea region, and determining whether roundwood production could be increased in some countries and could decline in others.

One very important area of interest in this study has been the roundwood market in the Baltic Sea countries. We have examined the forest ownership structure, roundwood market structure, forms of roundwood trade and roundwood prices. We were interested in the market share of private forest owners and the level of concentration of demand in roundwood markets in each country, whether there are middlemen of some kind in the roundwood market, and so on. In this examination we attempt to identify differences and similarities between the examined countries and to draw conclusions on the possible future development.

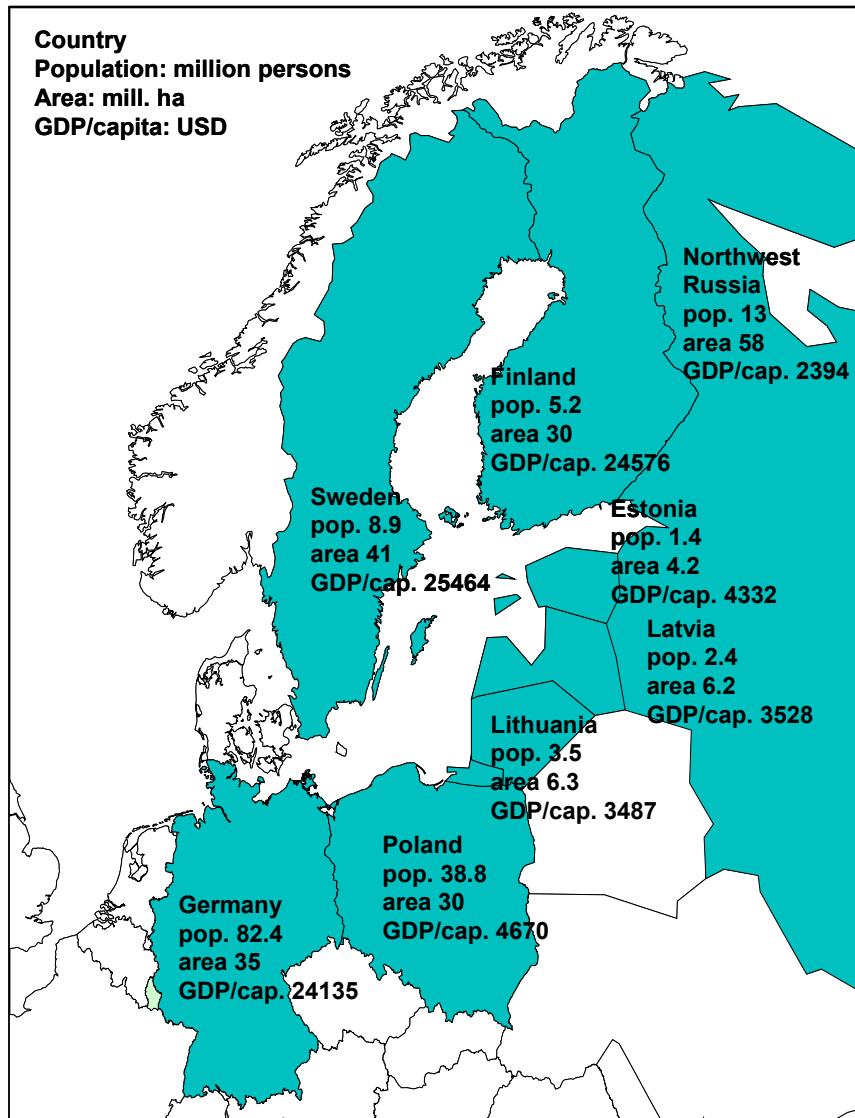
In the 1990s, roundwood trade in the Baltic Sea region increased considerably. The trade has been very important to both export and import countries. In this study we examine the development of roundwood exports and imports in the Baltic Sea states. We determine where the wood comes from and where it goes, and what future changes may occur in roundwood trade.

Germany, Sweden and Finland are most important sawnwood and paper producers in the Baltic Sea area. Finland and Sweden export forest industry products, the most important export area being Europe. In this study we examine the production of the sawnwood, wood based panels, and pulp and paper industries in the Baltic Sea countries. We are interested in how production, domestic consumption, export and import have developed in each country.

The Baltic Sea countries included in the study are Finland, Sweden, Germany, Poland, Estonia, Latvia, Lithuania and Northwest Russia. Northwest Russia is composed of the regions of Arkangel, Vologda, the Republic of Karelia, Leningrad, Novgorod, Pskov and the Tver region. These regions have close relations with the Baltic Sea countries, for example in roundwood trade. Forest resources, roundwood removal and wood increment data is available from Russia on a regional level but forest industry production figures cover the whole of Russia. Statistics used in this paper were generally obtained from Eurostat, the FAO and national forest statistics.

This examination forms the base to an estimation of the future development of the forest sector in the Baltic Sea countries. The development up to 2010 will be estimated by using alternative scenarios. Based on the present work we will also estimate possible effects of the future development on the forest sector in Finland.

This paper is structured as follows. In chapter two, information is provided on the economic situation of Baltic Sea countries. In chapter three we examine the forest resources and in chapter four the intensity of wood resource use. In the next chapter we handle forest ownership and the roundwood markets. Roundwood tradeflows in the Baltic Sea region are then considered, and in chapter seven examines forest industry production and foreign trade. Finally, in chapters eight and nine, a summary and conclusions are provided in both English and Finnish.



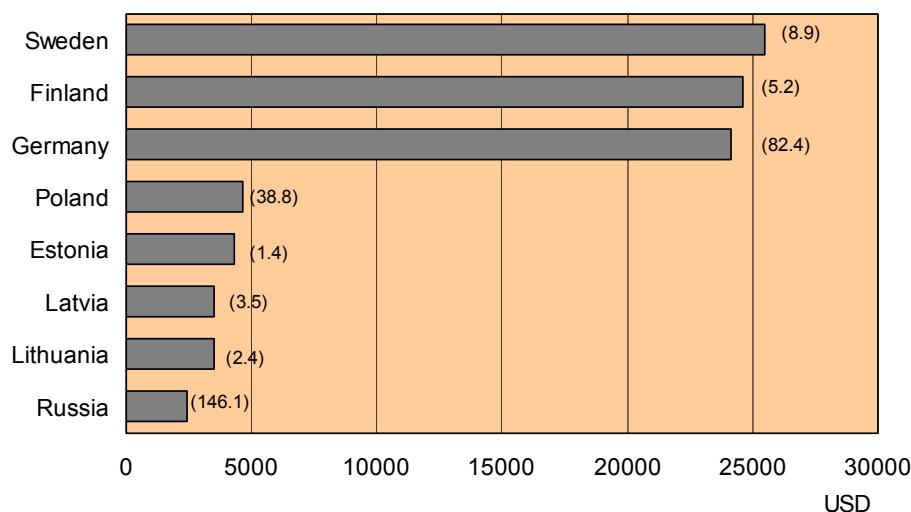
**Figure 1.** Population, area and GDP per capita in Baltic Sea countries year 2002 ([www.stat.fi](http://www.stat.fi))

## 2. ECONOMIC SITUATION IN THE BALTIC SEA STATES

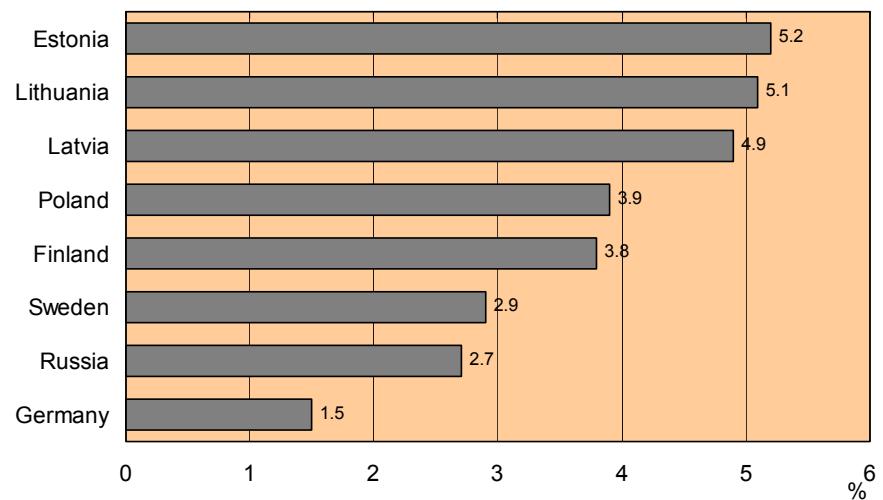
There lives about 155 million people in the Baltic Sea area. The population is concentrated on Germany and Poland: In Germany lives 53 % (82 million people) and in Poland 25 % (39 million people) of all Baltic Sea region people.

Economically, Germany is clearly the biggest country in the Baltic Sea area, with a gross domestic product 2.4 times greater than that of all other Baltic Sea countries together. In Sweden, Finland and Germany the per capita gross domestic product is 4-5 times higher than in other Baltic Sea countries.

The GDP average annual volume growth during 1995-2002 has been greatest in Estonia, Lithuania and Latvia. In these countries the economy has grown about five per cent per year. The lowest growth in the Baltic Sea area has been in Germany. The economy of Russia declined during 1994-2000 but started to grow strongly after that. The average annual volume growth during 1995-2002 was nearly three per cent per year.



**Figure 2.** Gross domestic product (GDP) per capita year 2002 in countries of the Baltic Sea region; population in millions of people in parentheses ([www.stat.fi](http://www.stat.fi)).



**Figure 3.** GDP average annual volume growth from 1995-2002 in Baltic Sea countries (OECD Economic Surveys).

### **3. FOREST RESOURCES**

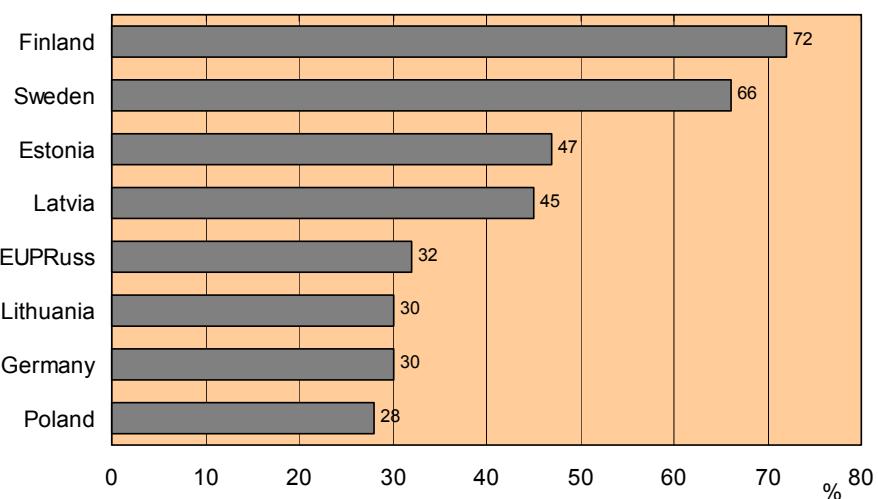
In the Baltic Sea area there are about 100 million hectares of forest available for wood supply, which is almost same volume as in European Union forest area (EU15). About 76 per cent of all this land is situated in Northwest Russian, Sweden and Finland. In Germany and Poland the forest land area available for wood supply is about half of that in Sweden and Finland. In Estonia, Latvia and Lithuania the forest land area is even less.

Finland is the most forested of the Baltic Sea countries examined, with over seven hectares out of ten consisting of forestland. The relative share of forests declines from north to south: the lowest is in Poland and Germany, which are located on the southern side of the Baltic Sea.

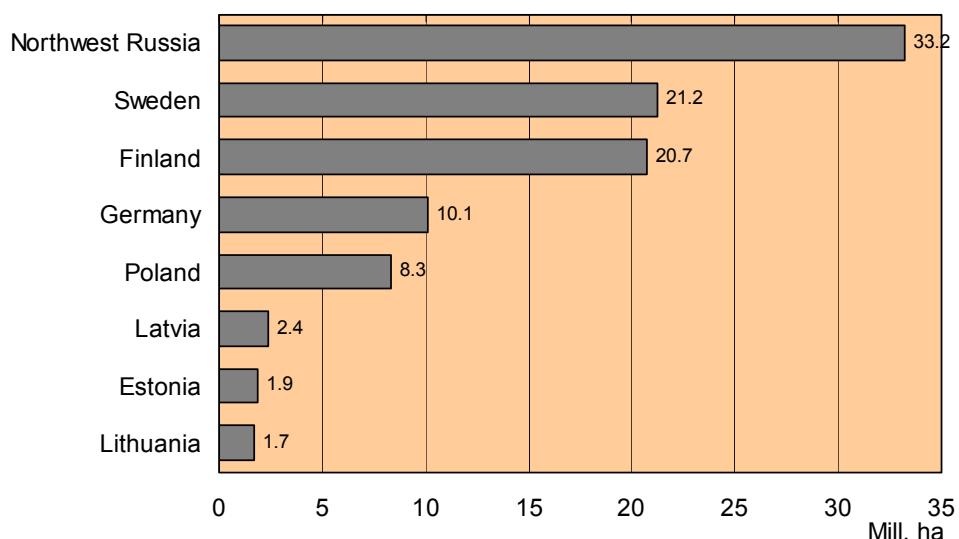
The highest number of forest hectares in the Baltic Sea area is in Northwest Russia, where the total forest area covers 45.5 million hectares but the ecologically and economically available forest area<sup>1</sup> is about 33 million hectares (Tilli, 2003). The main reason for the high proportion of economically unattainable forestland is the poor infrastructure in Russia (Veijola 2001-2003).

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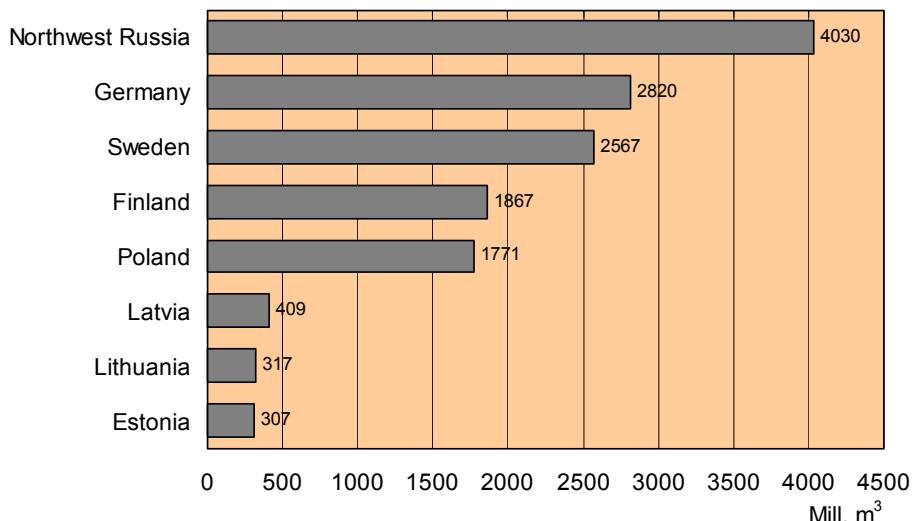
<sup>1</sup> The economically available forest land means forest area where the incomes from forest harvesting are higher than harvesting costs. In ecologically available forest land environment legislation doesn't restrict forest economically using. The amount of ecologically and economically available forest area is estimated in Lesnoj fond Rossii (1999) publication (Veijola 2001).



**Figure 4.** Forest area as a proportion of the total land area in the Baltic Sea countries (Global Forest Resources Assessment 2000, Pisarenko et al. 2001).



**Figure 5.** Forest area available for wood supply in the Baltic Sea countries (Global Forest Resources Assessment 2000, Pisarenko et al. 2001).



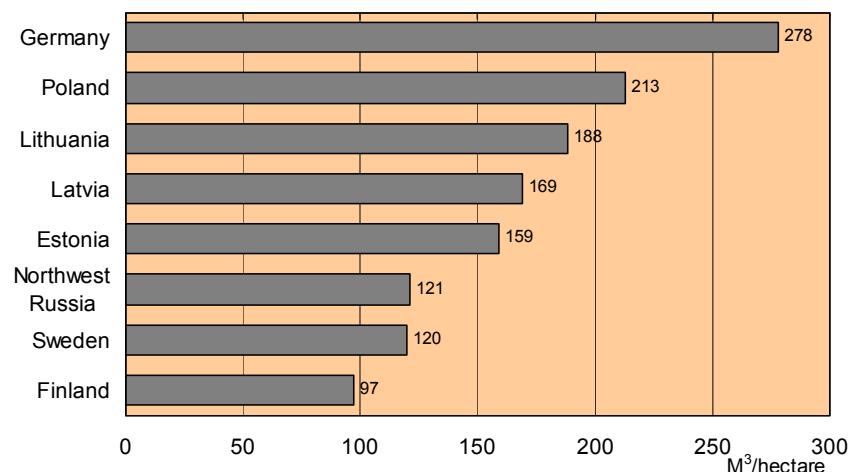
**Figure 6.** Total growing stock volume in forests available for wood supply in the Baltic Sea countries (Global Forest Resources Assessment 2000, Pisarenko et al. 2001).

The growing stock volume of forestland available for wood supply is about 14 billion m<sup>3</sup> in the Baltic Sea area, which is bigger than growing stock volume in European Union (EU(15)). The biggest growing stock volume, about 4 billion m<sup>3</sup>, is in Northwest Russian, although the growing stock volume of forest available for wood supply is only 72 per cent of the Northwest Russian total growing stock volume (Tilli, 2003). On the south side of Baltic Sea, in Germany and Poland, the growing stock is as large as in Sweden and Finland although the forest area is only half that in these two countries. In Estonia, Latvia and Lithuania the growing stock volume is very small compared to the other Baltic Sea countries.

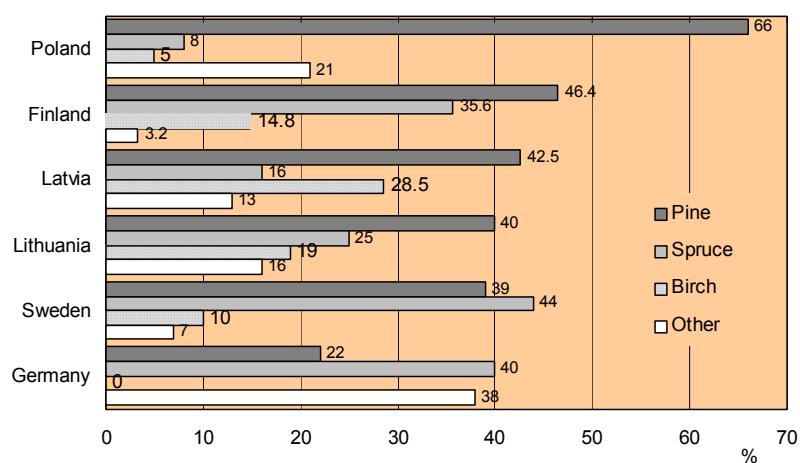
The mean volume of forests available for wood supply is greatest on the southern side of the Baltic Sea, and decreases when we move north. The mean volume in Germany is about 270 m<sup>3</sup> per hectare, but in Finland it is a little under 100 m<sup>3</sup> per hectare.

Pine and spruce are the most common tree species in the Baltic Sea area. In Finland and Sweden these conifers form the greatest proportion of trees, with over 80% of the growing stock consisting of pine and spruce. Non-coniferous trees are the most common in Germany, where almost 40 per cent of all trees are non-coniferous such as beech and oak. In Poland

forests are mostly pine, while spruce forests are the most common in Sweden and Germany.



**Figure 7.** Mean volume of forests available for wood supply in the Baltic Sea countries (Global Forest Resources Assessment 2000, FAO, Pisarenko et al. 2001).

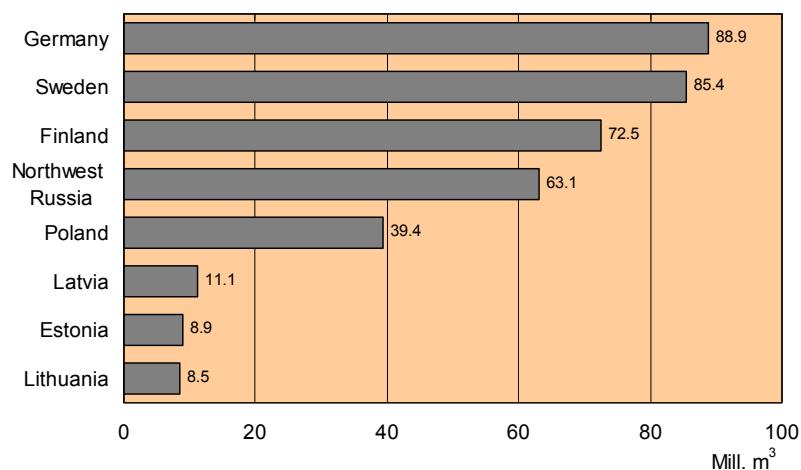


**Figure 8.** Growing stock on forest land according to tree species in the Baltic Sea countries (Finnish statistical yearbook of forestry 2002, Zajac, S. 1997, Statistisches Bundesamt, Latvia's forest sector 2000, Lithuanian statistical yearbook of forestry 2001, Skogsstatistisk årsbok 2002).

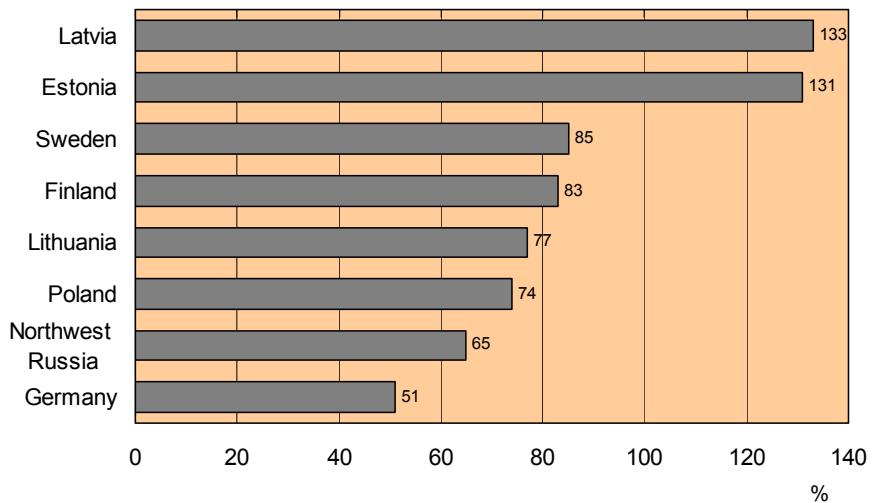
## 4. THE INTENSITY OF UTILISATION OF FOREST RESOURCES

The net annual increment in the forest available for wood supply is about 380 million m<sup>3</sup> in the Baltic Sea area. In 2001, roundwood production amounted to 281 million m<sup>3</sup>. In two states, Latvia and Estonia, the harvesting volume increased to more than the net annual increment in the forest available for wood supply. The highest positive difference between the harvesting volume and the net increment was in Northwest Russia and Germany.

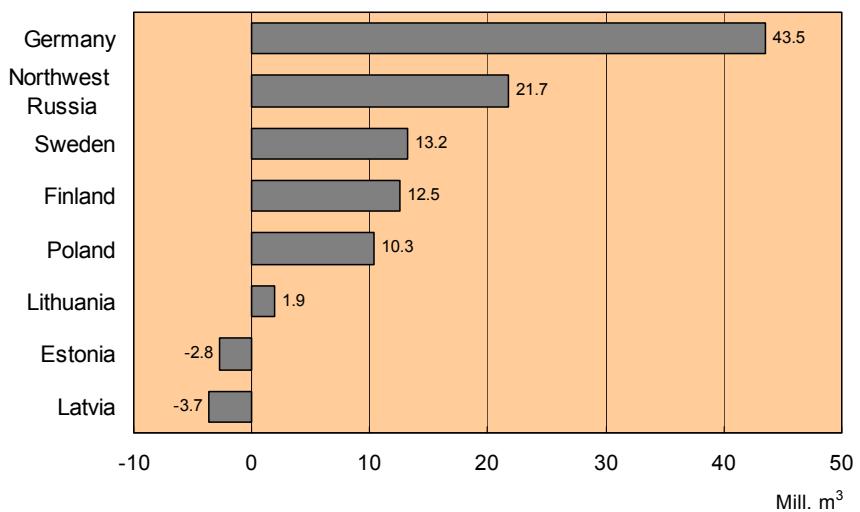
Germany has the biggest net annual increment in forest available for wood supply. Other big net increments were recorded in Sweden, Finland and Northwest Russia. In Northwest Russia the difference between the gross and net annual increments is very big. While in other countries the net annual increment in the forest available for wood supply is 70-80% of the gross annual increment of total forests, in Northwest Russia this figure is 36% (Tilli, 2003). One reason for the high proportion of natural losses is the age structure of Russian forests where the proportion of mature and overmature forests is clearly higher than in other countries. Another reason is the forest management which includes very little or no thinnings or other intermediate cuttings.



**Figure 9.** Net annual increment in the forest available for wood supply in the Baltic Sea countries (Global Forest Resources Assessment 2000, Pisarenko et al. 2001).



**Figure 10.** Roundwood production as a proportion of the annual net increment in the forest available for wood supply in the Baltic Sea countries (Global Forest Resources Assessment 2000, Pisarenko et al. 2001).



**Figure 11.** The difference between the net annual increment in the forest available for wood supply and annual roundwood production in the Baltic Sea countries (Global Forest Resources Assessment 2000, Pisarenko et al. 2001).

The difference between the net annual increment and the harvesting volume does not necessarily indicate the under exploited harvesting potential. In Germany, the authorities (National Forest Programme Germany) have stated that the sustainable usable roundwood availability is 5.7 m<sup>3</sup> per hectare, which means a harvesting amount of about 66.5 million m<sup>3</sup> (over bark). This is about 22 million m<sup>3</sup> less than net annual increment in the forests available for wood supply. In Sweden and Finland the difference between the net annual increment and the harvesting volume is also likely to be an overestimate of unused harvesting potential. Reasons for this are the forest laws and forest certification criteria, which have reduced the harvesting potential. Also forest ownership structure in Sweden and Finland can diminish forest harvesting.

In Northwest Russia the opposite situation is more likely. The estimated volume of 22 million m<sup>3</sup> and even more is probably available for harvesting. In addition, the large difference between the gross and net annual increment, the high share of mature and overmature forests and large proportion of economically unavailable forests increase the harvesting potential above the estimated 22 million m<sup>3</sup>.

## **5. FOREST OWNERSHIP AND ROUNDWOOD MARKETS**

Non-industrial private forest owners account for about 61 per cent of all forests in *Finland*, which is the biggest share in the whole Baltic Sea area. In roundwood markets, non-industrial private forest owners have an even bigger share, as about 85 per cent of all commercial wood is supplied from non-industrial private forest. The roundwood demand is concentrated in Finland; three big forest industry companies buy about 90 per cent of all wood. Private forests are used intensively, the power of attorney trade of private forest owner associations<sup>2</sup> and good wood price information affects roundwood trade. In spite of the high concentration of the demand, the roundwood price level in Finland is quite high compared to the other Baltic Sea countries. In the long term, partnership contracts between private forests owners and the forest industry will increase and perhaps the discussion over changing sawlog and pulpwood prices to wood specie prices will continue.

In *Sweden*, non-industrial private forest owners have an approximately 50 per cent share of the whole forest area while their share of the wood market for processed wood is about 60 per cent. A further difference compared to Finland is the high proportion of forests owned by the forest industry. The share of company forests was 39 per cent before 2001 and 28 per cent after 2001. Roundwood trade primarily takes place with wood buyers' pricing lists, while the taking of offers from many buyers, like in Finland, is quite rare in Sweden. Regional forest owners' co-operatives in Sweden buy wood from their members and deliver it forward to their own forest industry or other forest industry companies. In this system, after-sale adjustment for wood often take place. The Finnish forest association's power of attorney system is unknown in Swedish roundwood trade. The wood price level in Sweden is on average lower than in Finland.

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<sup>2</sup> Private non-industrial forest owner authorize forest owner association to collect offers from wood buyers and choose the best offer.

**Table 1.** Forest ownership structure in the Baltic Sea countries. The future share of non-industrial forest owners means the situation after the forest restitution process is complete. (Finnish statistical yearbook of forestry 2002, Kaczmarek, K. & Dudek, A. 1999, Mantau & Ollmann 1997, Latvia's forest sector 2000, Lithuanian statistical yearbook of forestry 2001, Statistical Yearbook of Estonia 2001, Skogsstatistisk årsbok 2002, Pisarenko et al. 2001).

	Forest ownership structure %				Average size of private forest holdings, ha
	Non-industrial forest owners		State	Others	
	Today	Future			
Estonia	32	63	37	0	6.6
Finland	61	61	25	14	25
Sweden	51	51	14	35	45
Lithuania	29	50	50	0	4.5
Germany	40	46	34	20	7.6
Latvia	43	43	50	7	8.5
Poland	17	17	83	0	1.0
Russia	0	0	100	0	-

In Russia the state owns all forests and forest use is organised under a forest leasing system and by the sale of felling licences (Tracing Russian Wood Imports 2001, Veijola 2001-2003). The system has not worked as hoped by the state because the incomes from wood have remained at a low level. There are two reasons for this: wood production in leasing forests has stayed below the cutting plans and leasing prices have in many cases been at the minimum level. In felling licence auctions the wood price has been better, but in many cases auctions also lack real competition (Holopainen, 2003). In Russia there are many middlemen in the wood market who deliver wood to the domestic forest industry and foreign wood buyers. The function of the roundwood market is probably quite inefficient and it suffers from corruption. An indication of the inefficiency and corruption is that the government obtains only a couple of euros for wood per cubic meter whose price on the Finnish border is about 30-40 euros for sawlogs and 20-30 euros for pulpwood. Russia will remain without private forest ownership in

the near future and the use of forest resources will probably be based on the present systems (Veijola 2001-2003).

In *Estonia*, 32 per cent of forest land belongs to non-industrial private forest owners, but in the wood market their share is over 50 per cent. When the process of returning and privatising forests is complete the share of private forests will rise to about 64 per cent (Järvinen et al. 2003). Roundwood trade in Estonia focuses on sawlogs, with various company prices at the saw, and on pulpwood wood export where companies pay harbour prices. The state sells its own wood by auction from the roadside or from the forest (felling licence). Private forest owners sell their wood from stumpage, from the roadside or deliver it to sawmills or the harbour. The market includes many middlemen, contractors and increasing numbers of Finnish and Swedish forest industry companies. There are some problems in the wood market such as wood thefts and taxes that are left unpaid. Reported wood price statistics are based on wood sold by the state. In the future, practices in the wood market are going to stabilise (regular contracts to roundwood trade) and stumpage selling is going become probably the most frequent form of sale.

In *Latvia*, non-industrial private forest owners own an approximately 43 per cent share of forestland and the return of forests to their former owners has been completed. The market share of private forest owners in the wood market is about 60 per cent. The structure and function of roundwood markets is similar to that in Estonia. The Latvian state sells about one third of its wood by auction. The rest of the state-owned wood comes from leasing forests where the leasing time can be as long as 90 years. There are similar problems in the roundwood markets to those in Estonia. Latvia has no official wood price statistics as in Estonia.

In *Lithuania*, 29 per cent of forestland is owned by non-industrial private forest owners, and when the process of returning and privatising forests is complete this share will rise to 50 per cent. Private forest owners' share in the wood market is about 38 per cent and the role of the state in Lithuania is greater than in Estonia and Latvia. In other ways, however, the structure and function of roundwood markets is similar to Estonia and Latvia. The Lithuanian state sells a major part of its wood from the roadside by auction. The increasing sale of wood by private forest owners has reduced wood prices in Lithuania (Lithuanian Statistical yearbook...). As in Estonia and Latvia there are some problems in the roundwood markets like wood

stealing and taxes are left to pay. In Lithuania wood price statistics are based on wood selling by the state.

In *Poland*, non-industrial private forest owners have an approximately 20 per cent share of forestland and the state owns the remaining 80 per cent. In practice, all wood in roundwood markets comes from state forests because of the small size and low average growing stock of private forests. Private forests in Poland are mostly household forests. The state removes the wood from its forest with its own workers and sells it from the roadside to the forest industry. There are no official statistics on roundwood prices, but because of the state monopoly of wood sales the price level is probably high compared to the Baltic states. The forest industry in Poland imports a certain amount of its wood so that it can compare the price level with state wood. In the future, wood harvesting will probably become more efficient and some of the harvesting work will be contracted out.

In *Germany*, 40 per cent of forestland is owned by non-industrial private forest owners and their market share in wood market is about 30 per cent (ZMP- Marktbilanz Forst....). The rest of the forestland belongs to the state, communities and parishes. The share of private forests and the roundwood structure differs between states in Germany. The demand side of the roundwood market is quite dispersed and there are many middlemen in the markets.

Concerning the roundwood supply, the Baltic Sea region states can be divided into three groups. In *Finland and Sweden*, the state has a small market share in the roundwood market and the market share of private forest owners is high. Sweden and Finland also differ from each other. In Sweden, the forest industry's own forests are a bigger supply source of wood than in Finland. *The second group is formed by the Baltic states*, where about half of the wood supply comes from state-owned forests and the other half from privately owned forests. The primary selling method in state forests is by auction. *The third group consists of Poland and Russia*, where wood supply is based on state-owned forests alone. The wood selling monopoly of the state can cause problems in Poland, where wood is sold on the roadside and the state also uses its own workers in wood harvesting. In Poland the state can transfer the stumpage price and wood harvesting costs directly to the wood roadside price. In this case, the incentive to harvest more efficiently is weakened.

The Baltic Sea states can also be divided into groups according to the roundwood market demand side structure and the function of middlemen. In Finland and Sweden the demand side is highly concentrated because of the mergers in the forest industry. The concentration of wood demand and on the other hand the thousands of small private forest owners has created a middleman system in both Finland and Sweden that takes care of private forest owners' interests. In Finland this middleman is the forest owners' association, which with the power of attorney system makes wood buyers compete for the forest owners' wood. In Sweden, regional co-operatives work as middlemen in the wood market.

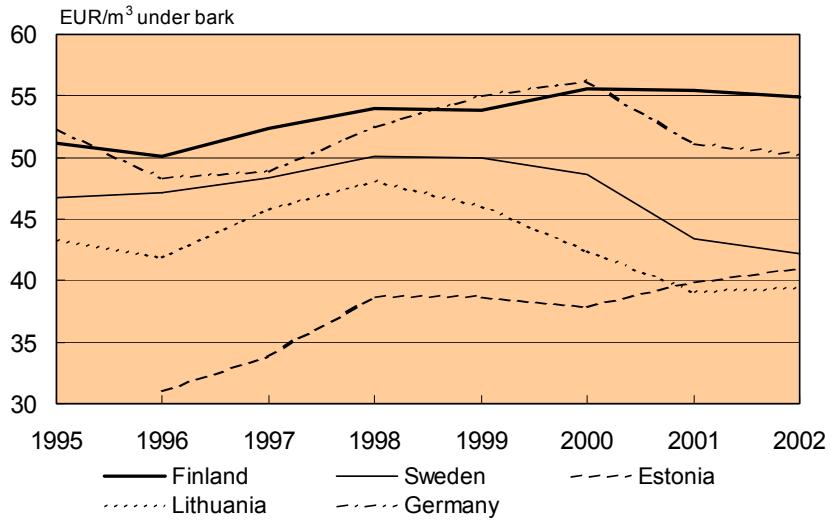
The structural change in forest industry in Finland and Sweden has not yet taken place in the other Baltic Sea states, where the wood market demand side is quite diverse. This is one reason why in the Baltic states and in Germany many forest industry companies do not establish wood delivering departments but buy wood from middlemen. In the Baltic States the roundwood markets are young and many illegal transactions take place between middlemen and forest owners. Also in Russia middlemen guide wood flows to the domestic forest industry and foreign wood exporters. Unlike other Baltic Sea states there is corruption in Russia, and this corruption explains the large difference between the stumpage price and export price of wood.

The comparison of roundwood price levels between Baltic Sea states is quite difficult. The quality standards and dimensions vary; for example, in Sweden, Estonia and Lithuania wood price are under bark and in Finland and Germany over bark. In rough comparison<sup>3</sup>, the price level in many wood assortments is highest in Finland. One exception is spruce sawlogs, whose price is clearly highest in Germany.

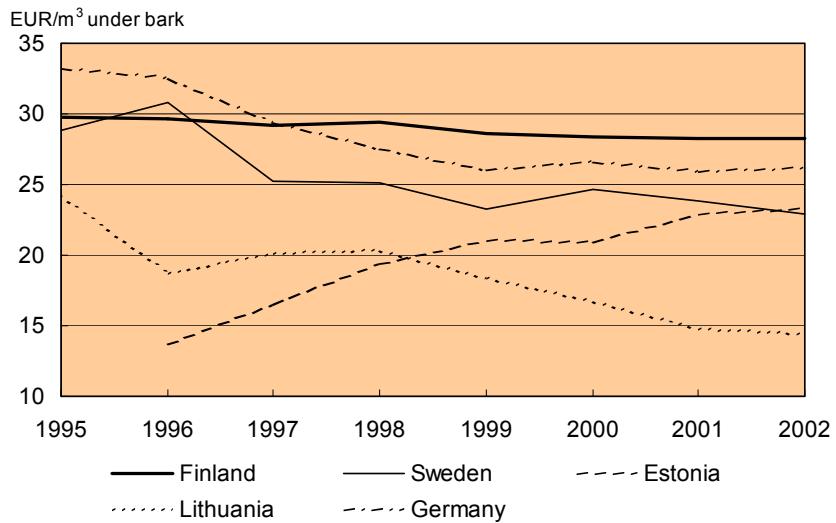
Roundwood production has increased in Finland, Poland, Latvia and Estonia. In other countries roundwood production remained at the same level in 2001 as in 1995. Although roundwood production has clearly decreased since 1995 in Russia as a whole, production in Northwest Russia has remained stable. In relative terms the biggest increase in roundwood production has occurred in Estonia and Latvia, where it has increased by 2 to 3-fold since 1995.

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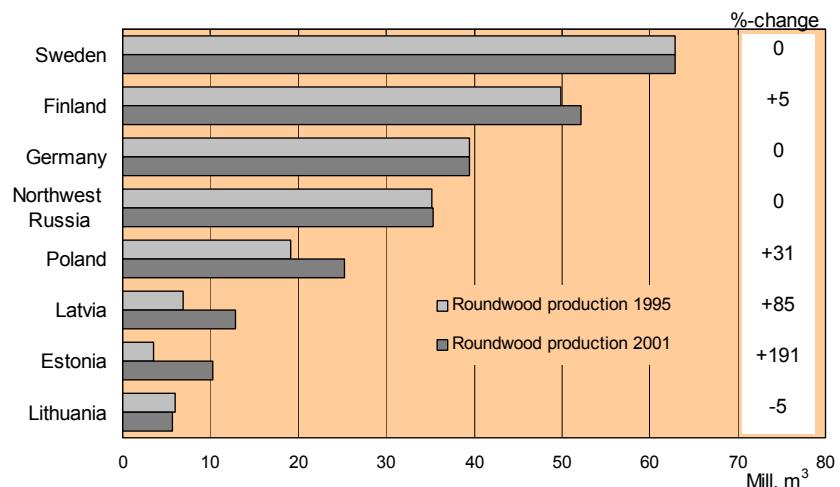
<sup>3</sup> The comparison of roundwood price levels was made by using roadside prices. Roundwood overbark prices in Finland and Germany changed to the underbark prices by using number 1,15 (overbark price x 1,15 = underbark price)



**Figure 12.** Roadside prices of pine sawlogs between 1995-2002 in Finland, Sweden, Estonia, Lithuania and Germany (*Metsätaloustilinen vuosikirja 2002, Skogstatistisk årsbok 2002, Statistical yearbooks of Estonia, Lithuanian Statistical yearbooks, ZMP-Marktbilanz Forst und Holz 2002*).

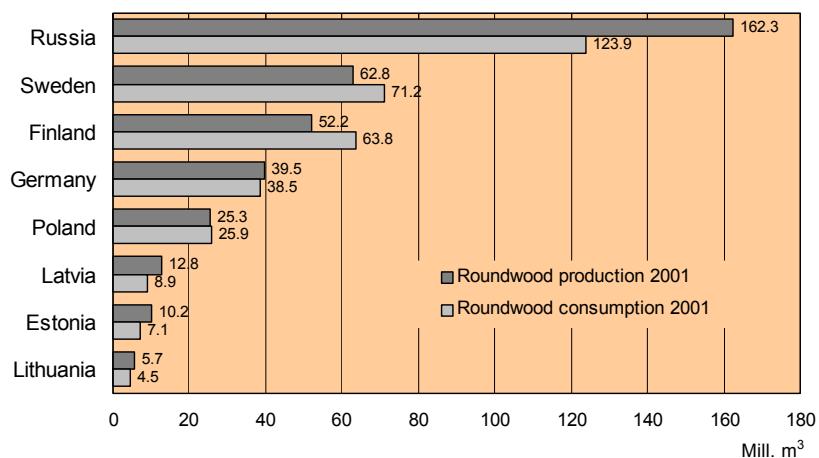


**Figure 13.** Roadside prices of pine pulpwood between 1995-2002 in Finland, Sweden, Estonia, Lithuania and Germany (*Metsätaloustilinen vuosikirja 2002, Skogstatistisk årsbok 2002, Statistical yearbooks of Estonia, Lithuanian Statistical yearbooks, ZMP-Marktbilanz Forst und Holz 2002*).



**Figure 14.** Roundwood production in 1995 and 2001 (under bark) in the Baltic Sea countries (Eurostat Forestry Statistics 1995-2001, Pisarenko et al. 2001, [www.forest.ru](http://www.forest.ru)).

The Baltic Sea states can be divided into three groups according to the relationship between roundwood production and apparent consumption. In Sweden and Finland the apparent consumption of roundwood exceeded its production. In Germany and Poland the apparent consumption and production were almost equal. In Russia, Latvia, Lithuania and Estonia, roundwood production exceeded the apparent consumption.



**Figure 15.** Roundwood production and apparent consumption in 2001 in the Baltic Sea countries (Eurostat Forestry Statistics 1995-2001, [www.forest.ru](http://www.forest.ru)).

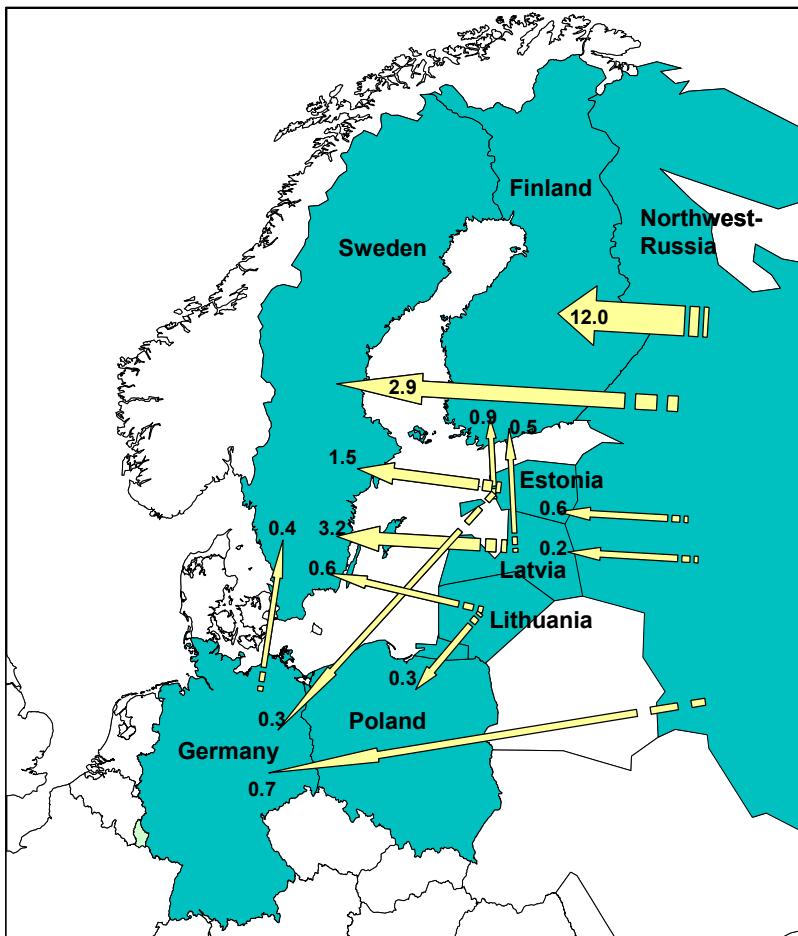
## 6. ROUNDWOOD TRADE FLOWS

Russia is the biggest roundwood exporter in the Baltic Sea area. Over half of the total roundwood export from Russia goes to the Baltic Sea area countries. The rest goes to Asia, mostly to China, South Korea and Japan. Roundwood export from Russia has increased since 1995. At the same time, export to the Baltic Sea area countries has also increased and in 2001 it was about two times greater than in 1995-1997. Finland is clearly the biggest target for wood export from Russia, receiving about two-thirds of all Russian Baltic Sea export. Sweden is the second biggest import country for Russian wood. Since 1995, small quantities of Russian roundwood has been exported also to Germany and Estonia. Roundwood export to Finland is mostly pulpwood, whereas Germany and Estonia mostly import sawlogs from Russia.

The export of coniferous roundwood from Russia has considerably increased since 1995. In 1998-1999 the export of non-coniferous roundwood exceeded that of coniferous wood, but since then the export of coniferous wood has been greater. Finland is clearly the biggest importer of non-coniferous wood from Russia, receiving about 85% of Russian non-coniferous wood exports. Finland is also the biggest coniferous wood import country.

**Table 2.** *Industrial roundwood export (mill.m<sup>3</sup>) from Russia to the Baltic Sea countries and other areas during 1995-2001 (FAOSTAT Forestry Database).*

Year	Finland	Sweden	Germany	Estonia	Baltic Sea	Total export
1995	7.8	1.7	0	0	9.5	16.9
1996	5.9	1.3	0.1	0	7.3	15.1
1997	5.8	1.8	0.1	0.1	7.8	17.8
1998	7.6	2.0	0.2	0.2	10.0	20.0
1999	8.7	2.1	0.6	0.5	11.9	27.6
2000	10.2	3.4	0.7	0.4	14.7	30.8
2001	12.0	2.9	--	0.6	15.7	37.3
Change from 1995 to 2001	53%	70%	--	--	65%	120%



**Figure 16.** Roundwood tradeflows (mill. m<sup>3</sup> underbark) in the Baltic Sea region in 2001 (FAOSTAT Forestry Database).

About 80% of Estonian wood exports go to the Baltic Sea area, namely to Sweden, Finland and Germany. Since 1995, roundwood export from Estonia has increased by more in relative terms than that from Russia. The majority of exported roundwood goes to Sweden, but the most rapid increase in export has been to Finland. Wood export to Germany began in 1998. The export of roundwood from Estonia is mostly pulpwood.

The export volume of coniferous wood from Estonia is a little greater than that of non-coniferous wood. Although the majority of coniferous wood has gone to Sweden, the majority of non-coniferous wood has been exported to Finland. Germany only imports coniferous wood from Estonia.

**Table 3.** Industrial roundwood export (mill. m<sup>3</sup>) from Estonia to the Baltic Sea countries and other areas during 1995-2001 (FAOSTAT Forestry Database).

Year	Sweden	Finland	Germany	Baltic Sea	Total export
1995	0.4	0.6	0	1.0	1.2
1996	0.2	0.2	0	0.4	0.6
1997	1.8	0.7	0	2.5	2.9
1998	2.2	0.7	0.1	3.0	3.8
1999	1.9	1.0	0.2	3.1	3.9
2000	2.2	1.0	0.2	3.4	4.3
2001	1.5	0.9	0.3	2.7	3.5
Change from 1995 to 2001	275%	50%	--	170%	191%

**Table 4.** Industrial roundwood export (mill. m<sup>3</sup>) from Latvia to the Baltic Sea countries and other areas during 1995-2001 (FAOSTAT Forestry Database).

Year	Sweden	Finland	Baltic Sea	Total export
1995	2.5	0.6	3.1	3.8
1996	1.5	0.3	1.8	2.0
1997	1.8	0.1	1.9	2.1
1998	2.1	0.3	2.4	2.8
1999	2.9	0.1	3.0	3.0
2000	3.7	0.3	4.0	4.2
2001	3.2	0.5	3.7	4.0
Change from 1995 to 2001	28%	-16%	19%	5%

Wood export from Latvia doubled from 1996-1997. About 95% of wood is exported to the Baltic Sea area, mostly to Sweden, with about 10% of wood going to Finland. Exported wood is mostly pulpwood.

Roundwood export from Latvia is divided equally between coniferous and non-coniferous wood. Export volumes of both have doubled since 1997-1998. Sweden imports both coniferous and non-coniferous wood from Latvia, but Finland only imports non-coniferous wood.

Roundwood export from Lithuania is clearly less than that from Estonia and Latvia. The export volume in 2001 was three times greater than in 1997-1998. Lithuania mainly exports pulpwood, with all exports going to the Baltic Sea area. Sweden is the biggest importer of Lithuanian wood, followed by Poland and Russia. Wood export to Russia goes to supply the pulpwood industry of the Kalingrad region.

Since 2001, Lithuania has exported more coniferous than non-coniferous wood. The coniferous wood goes to Poland and Russia, while Sweden imports both coniferous and non-coniferous wood.

**Table 5.** *Industrial roundwood export (mill. m<sup>3</sup>) from Lithuania to the Baltic Sea countries and other areas during 1995-2001 (FAOSTAT Forestry Database).*

Year	Sweden	Poland	Russia	Baltic Sea	Total export
1995	0.5	0	0.8	1.3	1.6
1996	0.2	0.1	0	0.3	0.5
1997	0.3	0	0	0.3	0.8
1998	0.4	0.1	0.1	0.6	0.8
1999	0.6	0.1	0.1	0.8	0.9
2000	0.7	0.3	0.2	1.2	1.2
2001	0.6	0.3	0.2	1.1	1.3
Change from 1995 to 2001	20%	--	-75%	-15%	-18%

The largest proportion of roundwood exported from Germany goes to central Europe; only 10% of the wood export goes to the Baltic Sea area, namely to Sweden and Finland. The total German wood export has increased slightly, but export to Sweden and Finland has remained unchanged.

The majority of German roundwood export consists of coniferous wood. All non-coniferous wood and most of the coniferous wood goes to Sweden. Finland imports a little coniferous wood from Germany.

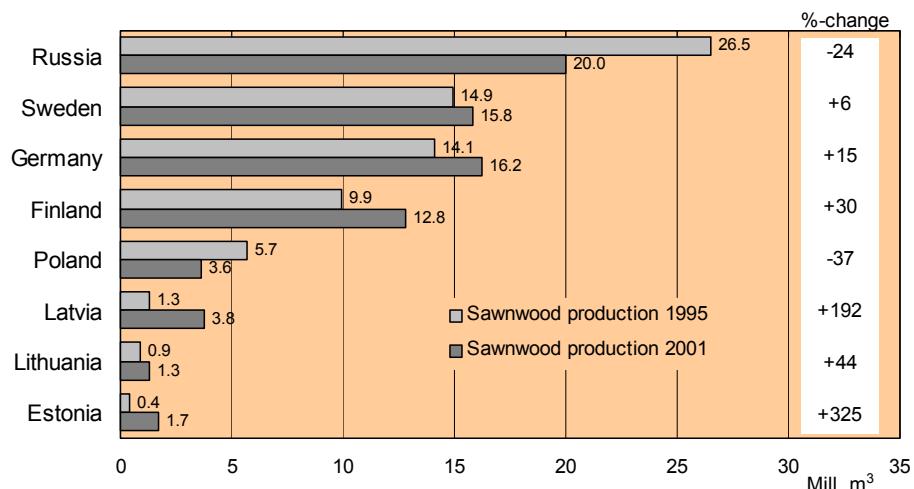
**Table 6.** *Industrial roundwood export (mill. m<sup>3</sup>) from Germany to the Baltic Sea countries and other areas during 1995-2001 (FAOSTAT Forestry Database).*

Year	Sweden	Finland	Baltic Sea	Total export
1995	1.0	0.1	1.1	5.0
1996	0.4	0.1	0.5	2.9
1997	0.4	0.1	0.5	4.1
1998	0.7	0.2	0.9	4.9
1999	0.7	0.1	0.8	4.6
2000	0.4	0.1	0.5	5.6
2001	0.4	0.1	0.5	4.2
Change from 1995 to 2001	60%	0%	-55%	-16%

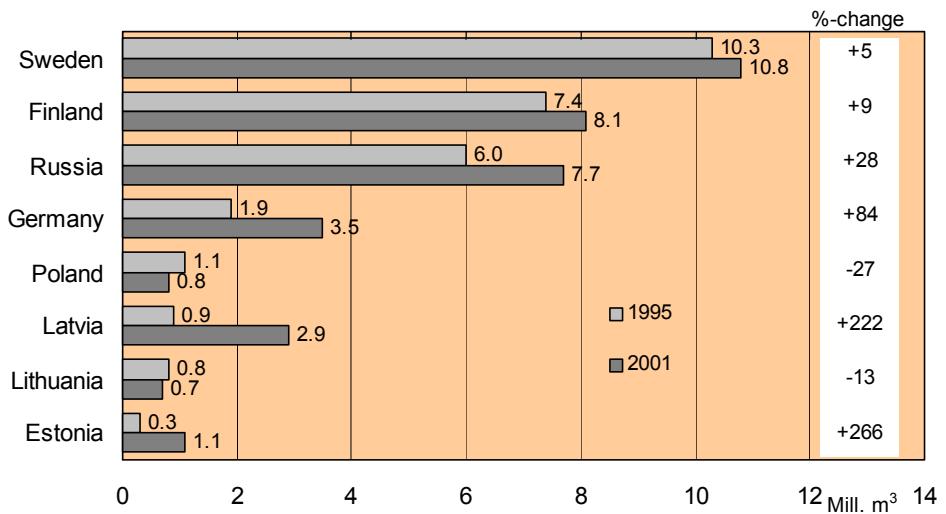
## 7. FOREST INDUSTRY PRODUCTION AND FOREIGN TRADE

Sawnwood production in the Baltic Sea states totalled 75.2 million m<sup>3</sup> in 2001, which was about the same as in 1995. However, production has clearly decreased in Russia (here we consider the whole of Russia due to lacking statistics on the Northwest Russia) and Poland. In other countries production has increased, in relative terms mostly in Estonia and Latvia. In both Finland and Germany sawnwood production has increased by about 2 million m<sup>3</sup>.

Sawnwood export has considerably increased in the Baltic Sea states, from 29 million m<sup>3</sup> in 1995 to 36 million m<sup>3</sup> in 2001. The biggest relative increase in sawnwood export has occurred in Estonia and Latvia, while in absolute terms the increase has been greatest in Latvia, Russia and Germany. Sawnwood export has also increased in Russia, where at the same time the sawnwood production has markedly decreased. Sawnwood export has decreased in Poland and Lithuania. Sawnwood production in the Baltic Sea area appears to be considerably greater than sawnwood consumption. The biggest sawnwood exporters are Sweden and Finland.



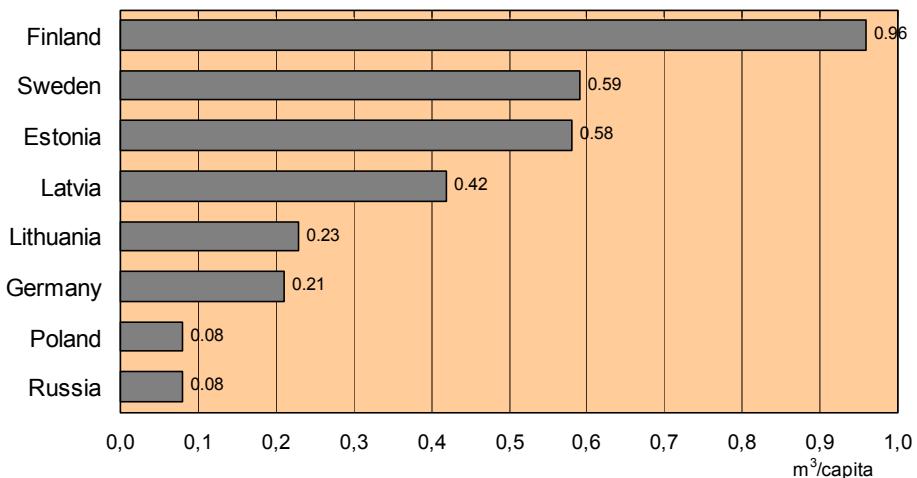
**Figure 16.** Sawnwood production in 1995 and 2001 in Baltic Sea countries (Eurostat Forestry Statistics 1995-2001).



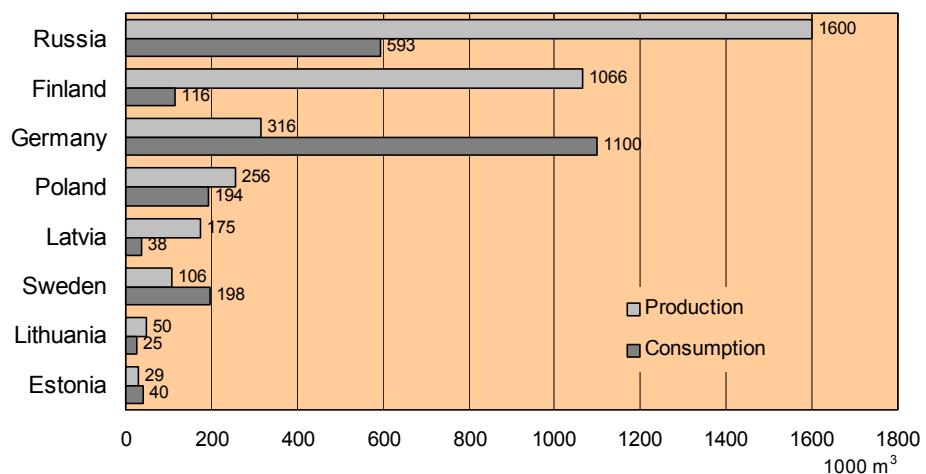
**Figure 17.** Sawnwood export in the Baltic Sea countries in 1995 and 2001  
(Eurostat Forestry Statistics 1995-2001).

The apparent sawnwood consumption per capita is greatest in Finland, where consumption increased during 1995-2001 and over half of the increase in production went to supply domestic consumption. In Russia, where sawnwood production has decreased but its export has increased, the sawnwood consumption per capita is the lowest in the Baltic Sea area. The consumption per capita is also low in Poland. In Germany the GDP per capita is on the same level as in Finland and Sweden, but the per capita sawnwood consumption is 0.21 m<sup>3</sup> compared with 0.59 m<sup>3</sup> in Sweden. Sawnwood consumption in Estonia is at the same level with the Swedish consumption.

Finland and Russia are major producers of plywood in the Baltic Sea area. Both countries produce more than is domestically consumed and they export the majority of their production. Latvia is also a plywood exporter in the Baltic Sea area. Germany is the biggest plywood importer, while Sweden also imports plywood.

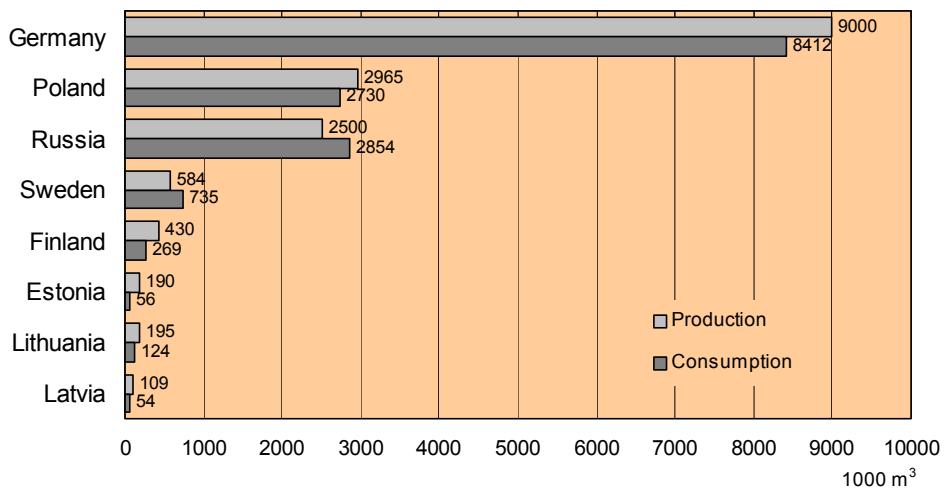


**Figure 18.** Apparent sawnwood consumption per capita in the Baltic Sea countries (Eurostat Forestry Statistics 1995-2001).

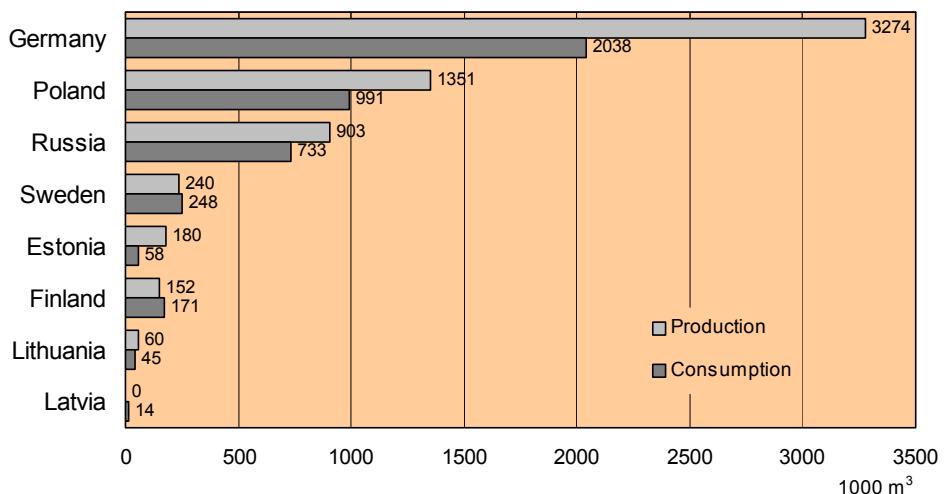


**Figure 19.** Plywood production and consumption in the Baltic Sea countries in 2001 (Eurostat Forestry Statistics 1995-2001).

Germany is clearly the biggest producer of particle board, while the second biggest producers are Poland and Russia. Overall, particle board production is quite home-market oriented, as it almost equals the domestic consumption. Estonia, Latvia and Lithuania are the only exceptions, because they export about half of their particle board production.



**Figure 20.** Particle board production and apparent consumption in the Baltic Sea countries in 2001 (Eurostat Forestry Statistics 1995-2001).



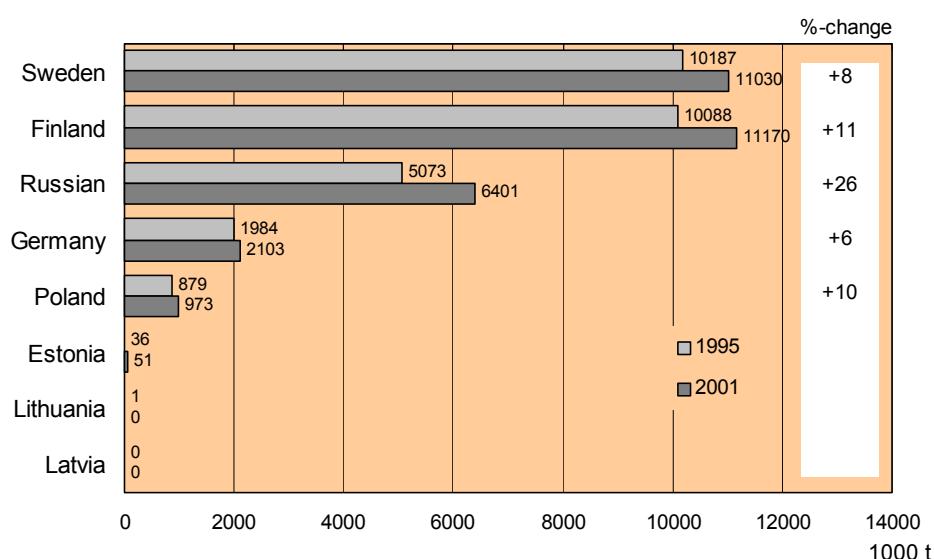
**Figure 21.** Fibre board production and apparent consumption in the Baltic Sea countries in 2001 (Eurostat Forestry Statistics 1995-2001).

Germany is the biggest producer of fibre board (about 3 mill. m<sup>3</sup>) in the Baltic Sea area, as well as being a big exporter. Poland also exports about one million m<sup>3</sup> fibre board.

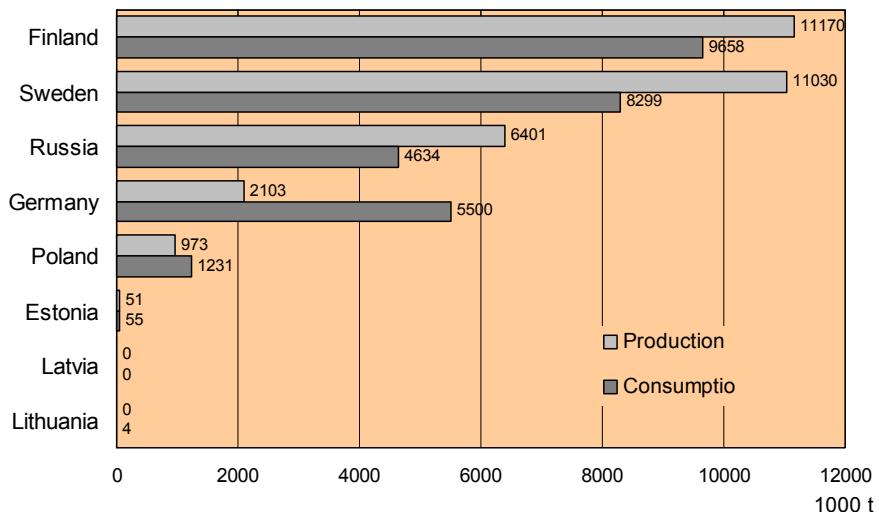
In 2001, wood pulp production in the Baltic Sea states was about 31 million tons, which represents an increase of about 3 million tons since 1995.

Finland and Sweden are two big wood pulp producers, together accounting for over 70% of all wood pulp production in the Baltic Sea states. In both Finland and Sweden wood pulp production has increased since 1995. Estonia, Latvia and Lithuania no longer produce wood pulp and hence do not export it. However, it is planned to build a pulpmill in Latvia in the near future.

Wood pulp is a raw material in the papermaking industry. In Finland and Sweden, most wood pulp production is used in paper making. Despite the huge paper production volume, both Finland and Sweden export some of their produced wood pulp mainly to the paper mills of Finnish and Swedish companies situated abroad. Germany is a major wood pulp buyer and uses also recycled paper extensively in its paper production.



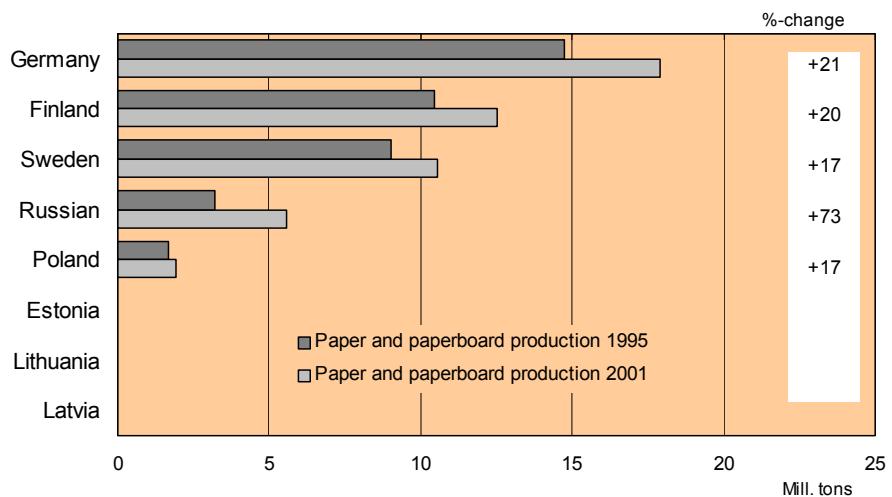
**Figure 22.** Wood pulp production in the Baltic Sea countries in 1995 and 2001 (Eurostat Forestry Statistics 1995-2001).



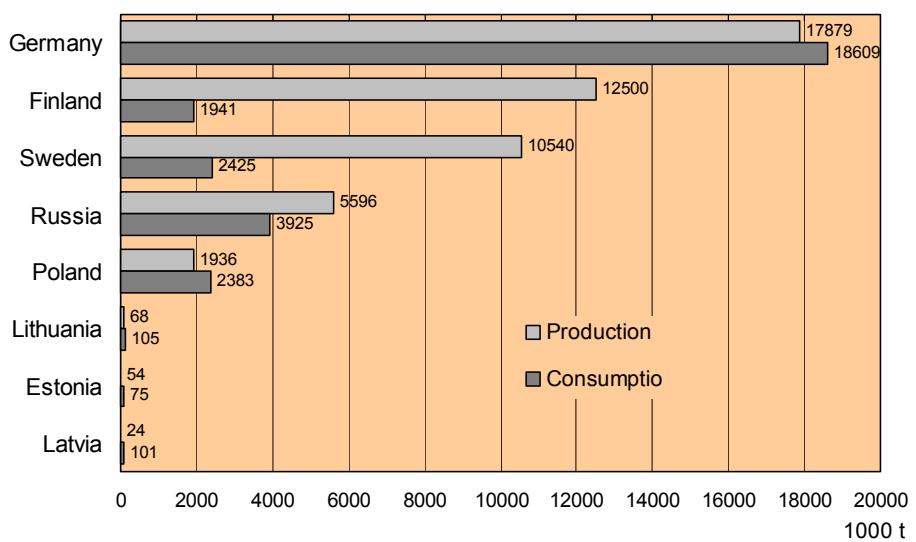
**Figure 23.** Wood pulp production and apparent consumption in the Baltic Sea countries in 2001 (Eurostat Forestry Statistics 1995-2001).

Paper and paperboard production has considerably increased in the Baltic Sea states, from about 39 million tons in 1995 to over 48 million tons in 2001. This is almost 20 million tons more than the total paper and paperboard consumption of the Baltic Sea states.

Germany is the biggest paper and paperboard producer in the Baltic Sea area. The next two biggest producers are Finland and Sweden. All these three countries have increased their paper and paperboard production since 1995. The biggest increase in production has taken place in Germany. In one way the three countries differ from each other: while the apparent consumption in Germany is at about the same level as the production, Finland and Sweden export 80-90% of their production. Poland, Estonia, Latvia and Lithuania are importers of paper and paperboard.

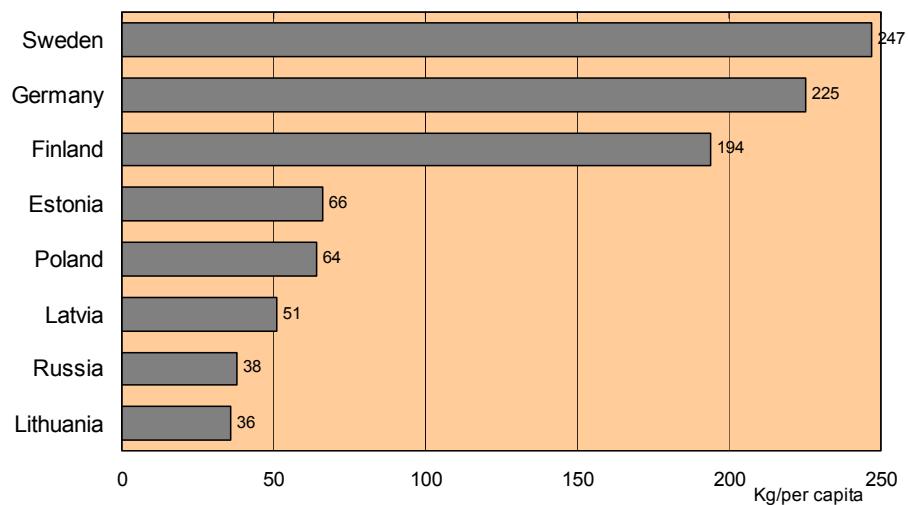


**Figure 24.** Paper and paperboard production in the Baltic Sea countries in 1995 and 2001 (Eurostat Forestry Statistics 1995-2001).



**Figure 25.** Paper and paperboard production and apparent consumption in the Baltic Sea countries in 2001 (Eurostat Forestry Statistics 1995-2001).

In Sweden, Germany and Finland paper and paperboard consumption per capita is clearly higher than in the other Baltic Sea countries. The per capita consumption in these three countries is 200-240 kg, compared with about 60 kg in Poland and Estonia. The lowest level of paper and paperboard consumption is in Lithuania and Russia.



**Figure 26.** Paper and paperboard consumption per capita in the Baltic Sea countries (*Pulp & Paper International*, July 2002).

## **8. SUMMARY AND CONCLUSIONS**

### **Purpose of the study**

The aim of the study was to describe the Baltic Sea region regarding the following factors:

- forest resources,
- the utilisation of forest resources,
- the forest ownership structure,
- roundwood markets,
- roundwood trade flows and
- forest industry development during the late 1990s and early 2000s.

With this work we have analysed how roundwood production, roundwood trade flows and forest industry production have developed in the Baltic Sea area since 1995. An important aspect of this study was to describe the forest ownership structure and roundwood markets in the Baltic Sea countries, and to attempt to identify differences and similarities in between them.

The examined countries were Finland, Sweden, Germany, Poland, Lithuania, Latvia, Estonia and Northwest Russia. Northwest Russia consisted of seven regions: Arkangel, Karelia, Leningrad, Vologda, Novgorod, Pskov and Tver. The main information sources in this paper have been Eurostat, FAO and national forest statistics.

### **The largest forest resources in the Baltic Sea region are in Northwest Russia**

In the Baltic Sea area there are about 120 million hectares of forest land, of which about 100 million hectares comprises forest available for wood supply. The growing stock volume of the forest available for wood supply is about 14 billion cubic metres. The Baltic Sea region share is over half of the European forest area and growing stock (in Europe 186 million hectare forests and 26 billion cubic metres).

The largest forest resources in the Baltic Sea area are situated in Northwest Russia, where the growing stock volume of forest available for wood supply is about 4 billion cubic metres. This is twice as big as in Finland. The greatest forest area as a proportion of all land area is found on the

northern and eastern part of Baltic Sea (Finland, Sweden and Northwest Russia), and this proportion decreases when moving to the south (Germany, Poland). The mean volume of growing stock shows the opposite trend. In Germany and Poland the mean volume per hectare is over 200 cubic metres and in Finland and Sweden about 100 cubic metres. Forests in the Baltic Sea area are dominantly coniferous.

### **Forest resources in Germany and Northwest Russia are the least intensively utilized**

Roundwood production in the Baltic Sea region has increased from 256 million cubic metres in 1995 to 280 million cubic metres in 2001. This production volume is still less than the net increment of forest available for wood supply in the Baltic Sea states. Northwest Russia and Germany have the lowest roundwood production as a proportion of the net increment, consequently, these countries have the best potential to increase roundwood production. Poland and Lithuania also have a possibility to increase roundwood production. In Finland and Sweden, however, it is unlikely to happen any great changes in the roundwood production volume in the future. In Estonia and Latvia roundwood production has increased over the net annual increment in forest available for wood supply and so the roundwood production volume could therefore even decrease in the future.

In Germany the difference between the net increment and roundwood production is over 40 million cubic metres. Despite the harvesting potential, roundwood production has remained unchanged since 1995. However, the year 2000 was an exception, as a lot of storm-felled wood was harvested in Germany. Nevertheless, wood use by the German forest industry has increased since 1995, the increased need has been covered by imported wood. One reason for this could be that domestic wood has been relatively more expensive than imported wood. However, another reason could be the insufficient domestic wood supply. In Germany, values in forestry other than roundwood production are very important, which can reduce the roundwood supply. It is highly unlikely that any big changes would occur in the future roundwood production in Germany.

In practice, the best opportunities to increase roundwood production are in Lithuania, Poland and especially in Northwest Russia. Roundwood production in Poland and Lithuania could be increased by ten million cubic metres at most, but wood resources in Northwest Russia make it possible to

increase roundwood production by as much as 20-30 million cubic metres. Forests in Northwest Russia are mostly mature, which means that a roundwood production level in excess of the net increment could be sustainable. In 2001, the roundwood production level in Northwest Russia was 42 million cubic metres. If this production will increase by about 30 million cubic metres it would increase the roundwood production of the whole Baltic Sea area by about 10 per cent.

It is not evident that roundwood production will increase in Northwest Russia in the future. The system for utilising wood resources has not worked as hoped, the economic position of roundwood procurement companies is weak and the harvesting technology is old, the infrastructure in Russia is poor and there is a lot of corruption in Russian society. An increase in roundwood production necessitate new investments in the forest industry, in western wood harvesting technology and in infrastructure.

### **Roundwood markets in the Baltic States will resemble the structure in the Nordic countries**

The Baltic Sea countries can be classified into three groups based on roundwood market structure. First in Finland and in Sweden, the state's role as a forest owner and wood seller is small and the role of private non-industrial forest owners is big: In Finland and Sweden, respectively, 85 per cent and 60 per cent of domestic roundwood used by the forest industry comes from private forests. The difference between Finland and Sweden is that in Sweden the forest industry's own forests are a bigger supply source of wood than in Finland.

The second group is formed by the Baltic states, Estonia, Latvia and Lithuania. In these countries, private forest ownership has increased considerably because of the process of returning and privatisation of forests. In Baltic states the state still remains quite a significant forest owner. When the privatisation process in the Baltic states will be completed, the state will still own about half of the forestland and thus play a notable role in the wood market.

The third group includes Poland and Russia, where practically taken all wood in the roundwood markets is supplied from state-owned forests. In Poland, non-industrial private forest owners have an approximately 20 per cent share of the forestland but private forests mostly supply household use because of the low average growing stock and small size of units.

There are differences between the various forest owner groups in the utilisation of wood resources and their behaviour in wood markets. Private non-industrial forest owners in Finland, Sweden and the Baltic states use their wood resources more effectively than the state. The state as a forest owner sells wood for about the same amount despite changes in wood demand or wood prices. Private forest owners sell wood for amounts that vary yearly in response to changes in wood demand and wood prices. Therefore the most effective way to rapidly increase the roundwood production volume in Russia might be to privatise the wood resources.

States market share of wood supply vary between 40-60 per cent in the Baltic states. The state sells its wood by auction at roadside or the forest authorities gives out felling licences. In Latvia, a proportion of the state-owned forests are leasing forests where the leasing time can be very long. The state has no notable wood-harvesting organisation of its own and the harvesting work is contracted out. Probably states wood selling stiffen the functioning of roundwood markets in some way in the Baltic states.

In Poland the state sells nearly all wood in the market. The state sells wood on the roadside to the forest industry using its own workers in harvesting. In Poland the state can transfer the self-determined stumpage price and wood harvesting costs to the roadside price so that the impetus to affect wood harvesting is weakened. The dominating role of the state in roundwood supply has probably led to the increase in wood imports to Poland.

In Russia the effect of the state monopoly on the roundwood market function is difficult to estimate. Forest management and utilisation in Russia is organised under a forest leasing system and by the sale of felling licences. The stumpage price determined by regional authorities for leasing forests and for felling licences is very low compared to the market price of the wood. The stumpage price of wood is a form of utilisation payment and the market price of wood is mostly determined by other factors than the stumpage price.

The structure of roundwood demand differs also between the Baltic Sea countries. In Finland and Sweden the demand side is highly concentrated because of the fusion that has occurred in the forest industry. Due to the great number of non-industrial private forest owners a middleman system has been created to take care of private forest owners' interests and help them with wood selling. This middleman in Finland is the forest owners' association and regional co-operatives in Sweden.

In the other Baltic Sea countries the structural change in forest industry has not yet occurred as strong as in Finland and Sweden and so the demand side is quite diverse. This is one reason why many forest industry companies in the Baltic states and in Germany buy the wood from middlemen. However, at the Baltic states the demand side is going to be more concentrated and wood buying companies establish their own delivery departments. In the Baltic States do not yet have a Nordic middleman system that takes care of private forest owners' interests.

Middlemen also exist in Russian wood markets guiding wood flows to the domestic forest industry and to foreign exporters. The corruption occurring in Russia deteriorates also the roundwood market functioning and transparency.

Despite the structural differences between the Baltic Sea countries, roundwood markets function quite satisfactorily in all countries except maybe Russia. This can be concluded from the high level of utilisation of forest resources and international wood trade. If a country carries out wood export trade, it could be expected to mean that there is no strong market power in either the supply or the demand side. If there is market power in the demand side and the wood price is below the market price, the supply side could increase wood export. Conversely, if market power in the supply side exists the wood price is above the market price, the demand side could increase roundwood import.

### **Roundwood flows from east to west**

The international trade of roundwood has increased in the Baltic Sea region. In 1995 the volume of wood trade was 16 million cubic metres and by 2000 trade had increased by 50 per cent to 24 million cubic metres. At the same time, roundwood production in the Baltic Sea region increased by only 9 per cent.

Roundwood trade flows originate from Northwest Russia and the Baltic states and end to Finland, Sweden and Germany. Finland has been the biggest import country, but quite a lot of wood has also exports to Sweden. Since 1995 coniferous roundwood trade has increased strongly. Germany undertakes roundwood trade mainly with central European countries not with states of the Baltic Sea.

Pulpwood trade has been a major part of the roundwood trade in the Baltic Sea region. Exports from Estonia, Latvia and Lithuania to Sweden and

also to Finland have mainly been pulpwood. In the Baltic states the strongly expanding sawmilling industry uses today all domestically produced sawlogs. However, Russia exports both sawlogs and pulpwood.

Roundwood tradeflows in the Baltic Sea region will probably change in the future. The transportation of roundwood increases its mill price, and in the long term the forest industry will build mills close to forest resources and thereby avoid wood transportation.

### **The Baltic Sea region does not yet form a single roundwood market**

The transition of Russia, Poland and the Baltic states to a market economy, the increase in roundwood buying in the several Baltic Sea region states by international forest industry companies and the increase in international roundwood trade in the Baltic Sea region has raised a question what Baltic Sea region forms a single roundwood market? In a single roundwood market, changes in wood demand are reflected in the whole market and increases and decreases in roundwood prices go in approximately the same direction and are equally strong. This kind of wood price co-movement can at least to some extent be seen between different regions in Finland (Tilli et al. 1999), where roundwood price development in different areas is the same for both pulpwood and especially sawlogs.

Mäki-Hakola (2002,2004) has studied wood price co-movement in the Baltic Sea area. The studies included wood prices from Finland, Estonia, Lithuania and Germany. According to research results the wood price co-movement has not been so consistent that the Baltic Sea area could form a single wood market, such as, Finland. However, results indicated that pine pulpwood and spruce sawlogs markets form to some extent an integrated market. Mäki-Hakola's (2004) study shows also that wood price levels have approached to each other in the late 1990s which can imply to a development towards a single market. Overall, roundwood markets in Baltic states, Poland and Russia are still under development and comparison with the Finnish and German markets does not give a true comprehension of the market integration. Also wood price statistics are not available in all East-European countries which make comparing impossible.

The comparison of roundwood price levels between the Baltic Sea states is quite difficult. Prices in Germany and Finland are over bark and in Sweden, Estonia and Lithuania under bark. In Germany, Estonia and Lithuania, price statistics cover only state-sold wood, although the amounts sold by private

forest owners are growing. In all countries except Finland, price statistics cover only delivery prices (prices at roadside). There are also differences between countries in both measure and quality standards in wood markets. However, the price level of roundwood in the Baltic Sea countries seems to be highest in Finland, except for spruce sawlogs, whose price is highest in Germany. The wood price level in the Baltic states is lower than in Finland, Sweden and Germany, but the difference seems to be decreasing all the time.

Roundwood prices differ between Finland and Sweden, although the structure of forest ownership and the forest industry is quite similar. One reason for the differences in price levels could be that in Finland a relatively greater proportion of the domestic wood comes from private forests than in Sweden where the industry is bigger forest owner.

#### **The Baltic Sea region: net export area for forest industry products**

Paper and paperboard production exceeded 48 million tons in the Baltic Sea area in 2001. The production has increased by about 23 per cent, or 9 million tons, since 1995. The biggest paper and paperboard producer in the Baltic Sea area is Germany, which is nevertheless a net importer. Finland and Sweden are the next biggest paper and paperboard producers. In addition to paper production, pulp production has also increased in the Baltic Sea area. Production was about 28 million cubic metres in 1995 and increased by 10 per cent to 31 million cubic metre in 2001. Finland and Sweden produce about 70 per cent of all pulp in the Baltic Sea region.

Sawnwood production in the Baltic Sea region has increased only slightly since 1995, reaching 75.2 million cubic metres in 2001. Behind this poor development has been a decline in production in Russia and Poland. In other countries, however, sawnwood production has increased. In relative terms, wood based panels industry production has been the most strongly increasing forest industry sector in the Baltic Sea region since 1995. Wood based panels production was 22 million cubic metres in 1995 and increased by 40 per cent to 31 million cubic metres in 2001. Germany accounts for about half of all wood based panels production in the Baltic Sea region. Another significant wood based panels producer is Poland. The production of board has considerably increased in both Germany and Poland.

The production of forest industry products is higher than the consumption in the Baltic Sea region and the area is net exporter. In 2001,

the production of paper and paperboard was over 20 million tons greater than the consumption, while sawnwood production exceeded consumption by over 29 million cubic metres.

The forest industry products from the Baltic Sea region are mostly exported to Western European markets. For paper and paperboard the biggest export countries are Finland and Sweden, and all Baltic Sea countries except Germany are net exporters of sawnwood. Despite the unchanging production, sawnwood export has increased from 29 million cubic metres in 1995 to 36 million cubic metres in 2001. Increasing production in Estonia and Latvia has been behind this increase in sawnwood export, and sawnwood export has also increased in Russia despite the decreasing production. The biggest sawnwood export countries in the Baltic Sea region are Sweden, Finland and Russia.

#### **The trend of growth will continue in the future, but in new areas**

The consumption of forest industry products will increase in the Baltic Sea region together with the expected growth in the economy (Kangas & Baudin 2003). According to the forecasts, the biggest increase in consumption in many products will occur in Northwest Russia, Poland and the Baltic states, where the present level of consumption is very low. While the per capita consumption of paper in Sweden, Germany and Finland is over 200 kg, in Russia, Poland and the Baltic states it is only 36-66 kg. In addition to paper products, the consumption of sawnwood will also increase in Russia, Poland and the Baltic states as the better economic situation leads to improvements in the currently weak condition of houses. Overall, the consumption of forest industry products will not only increase in former eastern European countries but will also continue to increase in Finland, Sweden and Germany. In Germany, the area of the former East Germany in particular is going to achieve the same standard of living as in western Germany.

In addition to consumption growth, also the production of forest industry products will probably increase in the Baltic Sea region. Especially in Northwest Russia there are still under utilised roundwood resources. Also in some other Baltic Sea states there are possibilities to increase roundwood production but values other than roundwood production limits the possible growth. The greatest increase in roundwood production will probably only take place in Northwest Russia.

In the future, as previously, it is likely that Northwest Russian wood will probably be processed both in Russia and in the other Baltic Sea states. Sawnwood production in the coming years will increase most strongly in Russia. This can be seen from investment plans by sawmilling companies. Hence, in the Baltic Sea area the importance of Russia as a sawnwood producer will increase. Instead, in the paper industry the increase in production, at least in the next 5-6 years, will happen mostly elsewhere than in Russia. The production of paper and pulp will probably grow in Finland and Sweden, where the capacity is not in full used. In Finland and Sweden a significant proportion of the increasing wood demand will probably be met by imports from Russia. In the Baltic States the import of sawnwood from Russia is also probably going to increase in the future.

Although both the consumption and production of forest industry products will increase in the Baltic Sea area, it will remain a net export area in the future. However, forest industry products trade flows are probably going to change in the next 5-10 years so that Russia, Poland and the Baltic States need to increasingly import paper products because their own production cannot cover the increase in consumption. In the long term, paper industry production may increase in at least some of these countries and domestic production will satisfy the increased consumption. For sawnwood, the domestic production in Russia, Poland and the Baltic states is sufficient to cover the increase in consumption and there is enough sawnwood to export.

The future development outlined above is the one that is the most probable in the Baltic Sea region. Alternative development paths are determined mainly through unexpectedly strong or weak development in Russia. Under stronger development the Russian economy grows more strongly than assumed, there is considerable investment in Russia, it remains a politically stable country and the level of corruption decreases. As a result the production of the forest industry grows very rapidly and there are, for example, a strong increase in foreign investment. Rapid economic development also increases the consumption of forest industry products strongly. The export of forest industry products from the Baltic Sea region could also grow.

The development in Russia could also be weaker than in the base development path. In this case, due to political and societal problems, Russian economy starts to decline and foreign investment ceases. There is also a risk that some restrictions will be placed on wood export. In this kind

of development the consumption and production of forest industry products will increase slowly, and will remain at a lower level in the whole Baltic Sea area than in the base development path. Because the consumption of forest industry products still grows in the other Baltic Sea countries, this leads to a decrease in the export development of forest industry products from the Baltic Sea area.

**Finland's relative share of the wood sector in the Baltic Sea area may decrease even though growth would continue**

Finland's share of wood resources in the Baltic Sea region is about 13 per cent. In 2001 Finland's share of production in the Baltic Sea region was about 21 per cent for roundwood, 17 per cent for sawnwood, 26 per cent for paper and paperboard and 34 per cent for pulp. Finland has thus used its wood resources more effectively than the Baltic Sea countries on average. In addition, Finland has increased its forest industry in excess of its own wood resources with the help of wood imports.

In the future, Finland's relative share of all roundwood and sawnwood production in the Baltic Sea region will probably diminish because the increase in roundwood and sawnwood production will occur mostly in Northwest Russia. However Finland's share of pulp and paper production will remain at about the current level for at least the next 5-6 years because building new capacity in the pulp and paper industry takes longer than new capacity in the sawnwood industry. In addition, pulp and paper production in Finland will continue to grow, in some part helped by the import of roundwood and chips. If the development in Russia turns out to be weaker than expected, Finland's share of all roundwood and forest industry production in the Baltic Sea region could stay at current level. The growth of the forest sector would be slower in the whole Baltic Sea region in this case.

Future development paths in the forest sector of the Baltic Sea region need to be studied more closely in the future research. Also the effects of this on the forest sector in Finland need to be examined in more detail.

## **10. YHTEENVETO JA JOHTOPÄÄTÖKSET SUOMEKSI**

### **Tavoite**

Tutkimuksessa tarkasteltiin Itämeren alueen maiden

- puuvaroja,
- puuvarojen käytön intensiteettiä,
- metsänomistuksen rakennetta,
- puumarkkinoiden toimintaa,
- puun kulkuvirtoja ja
- metsäteollisuuden tuotantoa 1990-luvun lopulla ja 2000-luvun alussa.

Tarkastelun avulla luotiin käsitys siitä miten hakkuut, puun kulkuvirrat ja metsäteollisuuden tuotanto ovat alueella vuoden 1995 jälkeen kehittyneet. Keskeisenä asiana oli metsänomistuksen ja puumarkkinoiden rakenteen tarkastelu. Tarkastelussa selvitettiin rakenteissa olevia eroja.

Tarkasteltavia maita olivat Suomi, Ruotsi, Viro, Latvia, Liettua, Puola, Saksa ja Luoteis-Venäjän alue. Luoteis-Venäjän alue käsitti Arkangelin, Karjalan, Leningradin, Pihkovan, Volognan, Novgorodin ja Tverin alueet Venäjältä. Pääasiallisina lähteinä tutkimuksessa ovat olleet Eurostat, FAO ja kansalliset metsätalastokirjat.

### **Itämeren suurimmat metsävarat sijaitsevat Luoteis-Venäjän alueella**

Itämeren alueen maiden metsäpinta-ala on noin 120 miljoonaa hehtaaria, mistä 100 miljoonaa hehtaaria on talousmetsää. Talousmetsien puuvaranto on noin 14 miljardia kuutiometriä. Koko Euroopan talousmetsien pinta-alasta ja puuvarannosta (186 miljoonaa hehtaaria ja 26 miljardia kuutiometriä) Itämeren alueen maiden osuus on yli puolet. Laskelmanissa Eurooppaan on luettu myös Valko-Venäjä ja Ukraina.

Itämeren alueella suurimmat metsävarat ovat Luoteis-Venäjän alueella, missä puuvarannon suuruus on 4 miljardia kuutiometriä. Suomen puuvarantoon verrattuna määrä on kaksinkertainen. Metsän osuus maapinta-alasta on suurin Pohjois-Itämeren valtioissa (Suomi, Ruotsi, Luoteis-Venäjä) ja etelään tultaessa metsän suhteellinen osuus laskee (Saksa, Puola).

Puiston keskitilavuus kehittyy pääinvastoin. Saksassa ja Puolassa hehtaarilla olevan puumäärän keskitilavuus on yli 200 kuutiometriä ja Suomen, Ruotsissa ja Luoteis-Venäjällä noin 100 kuutiometriä. Itämeren alueen metsät ovat havupuuvaltaisia.

### **Puuvarojen vajaakäyttöä Saksassa ja Luoteis-Venäjällä**

Hakkuut ovat nousseet Itämeren alueella vuoden 1995 noin 256 miljoonan kuutiometrin tasolta vuoden 2001 noin 280 miljoonan kuutiometrin tasolle. Hakkuut ovat kuitenkin edelleen selvästi alle Itämeren alueen talousmetsien noin 380 miljoonan kuutiometrin nettokasvun. Puiston kasvua ja hakkuita verrattaessa parhaat mahdollisuudet hakkuiden lisäämiselle olisivat Saksassa ja Luoteis-Venäjällä. Myös Puolassa ja Liettuassa hakkuita olisi mahdollista hiukan kasvattaa. Suomessa ja Ruotsissa hakkissa ei luultavimmin tapahdu mitään merkittäviä muutoksia tulevaisuudessa. Virossa ja Latviassa hakkuut ovat menneet jo yli talousmetsien nettokasvun ja siten hakkuut voivat jopa tulevaisuudessa laskea.

Saksassa talousmetsien puiston nettokasvun ja hakkuiden välinen ero on yli 40 miljoonaa kuutiometriä. Metsien hakkuumahdollisuksista huolimatta hakkuut ovat pysyneet liki muuttumattomia vuoden 1995 jälkeen. Tosin vuosi 2000 oli poikkeus. Tällöin Saksassa korjattiin runsaasti myrskyn kaatamaa puuta. Saksan metsäteollisuuden puun käyttö on kuitenkin vuoden 1995 jälkeen kasvanut, mutta lisääntynyt puun tarve on katettu puun tuontia lisäämällä. Puun kysyntä siis näyttää Saksassa lisääntyneen, mutta se ei ole kohdistunut kotimaiseen puuhun. Taustalla voi olla se, että kotimainen puu on ollut tuontipuuhun verrattuna kalliimpaa. Toinen mahdollinen syy voi olla tarjonnan puute: Saksassa metsien muut kuin puuntuotannolliset arvot ovat metsätaloudessa korostuneita, mikä voi hillitä puun tarjontaa. Hyvin todennäköisesti Saksassa ei tapahdu merkittävää hakkuiden nousua lähitulevaisuudessaakaan.

Käytännössä parhaat mahdollisuudet hakkuiden lisäämiselle ovat Liettuassa, Puolassa ja erityisesti Luoteis-Venäjällä. Puolassa ja Liettuassa hakkuiden kasvu voi olla suuruusluokaltaan noin kymmenen miljoonaa kuutiometriä, mutta Luoteis-Venäjällä puuvarat antavat mahdollisuuden jopa 20-30 miljoonan kuutiometrin hakkuiden kasville. Luoteis-Venäjällä puusto on pääosin hakkukypsyyden saavuttanutta vanhaa metsää, jossa metsätalouden kestävyyttä vaarantamatta hakkuut voivat ylittää puiston

kasvun. Vuonna 2001 Luoteis-Venäjän hakkuut olivat 42 miljoonaa kuutiometriä. Mikäli hakkuut kasvaisivat 30 miljoonalla kuutiometrillä, se lisäisi Itämeren alueen hakkuita noin 10 prosentilla.

Luoteis-Venäjällä hakkuiden kasvu ei ole itsestään selvää. Hakkuiden kasvua haittaavat metsävarojen hyödyntämisjärjestelmän heikko toimivuus, puun korjuualan yritysten heikko taloudellinen tilanne ja vanhentunut puunkorjuuteknologia, heikko infrastruktuuri ja yhteiskunnan korruptoitu-neisuus. Metsävarojen hyödyntämisen selvä lisääntyminen edellyttää metsä-teollisuuden investointeja, länsimaista puun korjuuteknologiaa ja investointeja infrastruktuuriin.

#### **Baltian maihin muodostumassa Pohjoismaiden kaltainen puumarkkinoiden rakenne**

Metsänomistuksen ja puumarkkinoiden rakenteen perusteella Itämeren maat voidaan jakaa kolmeen osaan. Suomessa ja Ruotsissa valtion merkitys metsänomistajana ja puun myyjänä on pieni ja vastaavasti yksityisy-metsänomistajien merkitys on suuri. Suomessa 85 % ja Ruotsissa 60 % teollisuuden käyttämästä kotimaisesta puusta tulee yksityismetsistä. Erona Ruotsin ja Suomen välillä on se, että Ruotsissa metsäteollisuuden omien metsien merkitys puun tarjontalähteenä on selvästi Suomea suurempi.

Toisen ryhmän muodostavat Baltian maat. Näihin maihin on syntynyt metsien palautus- ja yksityistämisprosessin seurausena merkittävä metsien yksityisomistus, mutta valtio jäänee edelleen varsin merkittäväksi metsänomistajaksi. Baltian maissa valtion omistukseen jää noin puolet metsämaasta ja valtion merkitys puumarkkinoilla on edelleen merkittävä.

Kolmannen ryhmän muodostavat Venäjä ja Puola, missä puun tarjonta perustuu lähes yksinomaan valtion metsien puuhun. Puolassa metsistä noin viidennes on yksityisessä omistuksessa, mutta yksityismetsien vähäpuusto-suudesta ja pienestä tilakoosta johtuen metsät toimivat lähinnä kotitarve-metsinä.

Metsänomistajaryhmien välillä on eroja hakuumahdollisuksien käytössä ja käyttäytymisessä puumarkkinoilla. Yksityismetsänomistajat Suomessa, Ruotsissa ja Baltian maissa käyttävät metsiensä hakkuumahdollisuksia valtiometsänomistajaa tehokkaammin. Valtio myy puuta liikimain samansuuruisen määrän vuodesta toiseen puun kysynnässä ja puun hintatasossa tapahtuvista muutoksista huolimatta. Yksityismetsänomistajien

puun myyntimäärität vaihtelevat vuosittain reagoiden puun kysynnässä ja hinnassa tapahtuviin muutoksiin. Mikäli Venäjällä haluttaisiin nopeasti lisää hakkuita, tehokkain tapa olisikin luultavasti metsien yksityistäminen.

Baltian maissa valtion osuus puun myyntimääristä (hakkuista) vaihtelee 40-60 prosentin välillä. Valtion omistamien metsien puun myynti tapahtuu pääosin huutokaupoin. Valtio huutokauppa sekä hakkuuoikeuksia että tienvarteen korjattua puuta. Latviassa osa valtion metsistä on myös pitkäaikaisilla vuokrasopimuksilla vuokrattuja. Valtiolla ei ole merkittävää omaa puunkorjuuorganisaatiota ja puun korjuupalvelu ostetaan pääosin urakoitsijoilta. Valtion puun myyntien vaikutusta markkinoiden toimintaan on vaikea arvioida. Todennäköisesti valtion puun myynnit jälkistävät markkinoiden toimintaa ainakin jossain määrin.

Puolassa valtio vastaa lähes täysin markkinoille tulevasta puusta. Valtio myy puunsa tienvarsikauppana hoitaen itse oman organisaationsa avulla myös korjuun. Puolassa valtio voi siten siirtää itse määrittämänsä kantohinnan ja puun korjuukustannukset puun tienvarsihintaan, jolloin esimerkiksi kannuste tehostaa puun korjuuta on pieni. Mahdollisesti valtion lähes tarjontamonopoliksi luonnehdittava asema kotimarkkinoilla on johtanut puun tuonnin Puolaan kasvuun vuoden 1995 jälkeen.

Venäjällä valtion tarjontamonopoliaseman vaikutusta puumarkkinoiden toimintaan on vaikea arvioida. Venäjällä puuvarojen hyödyntäminen tapahtuu metsien vuokrausjärjestelmän ja hakkuuoikeuksien kaupan avulla. Aluehallinnon myymistä vuokraoikeuksista ja hakkuuluvista perimä kantohinta on hyvin alhainen verrattuna puun markkinahintaan. Puun kantohinta on eräänlainen käyttömaksu ja puun hinta muodostuu pääosin muista tekijöistä kuin valtion saamasta kantohinnasta.

Puun kysyntärakenteen ja puumarkkinoilla esiintyvien välittäjien toiminnan perusteella Itämeren alueen maat voidaan myös jakaa ryhmiin. Suomessa ja Ruotsissa puun kysyntä on hyvin keskittynyt, johtuen metsäteollisuuden fusoitumisesta isompiin yrityskokoihin. Puun kysynnän keskittyminen ja toisaalta puun tarjonnan muodostuminen lukuista pienmetsänomistajista on tuonut sekä Suomen että Ruotsin puumarkkinoille yksityismetsänomistajien etuja valvovan välittäjäportaan. Tämä on Suomen puumarkkinoilla metsänhoitoyhdistyskenttä, joka yksityismetsänomistajien antamien valtakirjojen perusteella kilpailuttaa osan yksityismetsänomistajien puukaupoista. Ruotsissa välittäjänä esiintyvät alueelliset osuuskunnat, jotka

välittävät jäsentensä puuta sekä omistamalleen metsäteollisuudelle että myös muille puunjalostajille.

Muualla Itämeren alueen maissa Suomea ja Ruotsia vastaavaa metsäteollisuusyritysten fuusioitumista ei ole toistaiseksi yhtä mittavasti tapahtunut ja puun kysyntäpuolen rakenne on hajanainen. Osin kysyntä-rakenteesta johtuen monet metsäteollisuusyrityksistä Baltian maissa ja Saksassa ostavat puun joko kokonaan tai osittain puumarkkinoilla toimivilta välittäjiltä. Baltian maissa puun kysyntä on kuitenkin koko ajan keskittyvä ja puun ostajat perustavat myös omia hankintaosastoja. Sen sijaan pohjoismaalaista metsänomistajien etujärjestöyyppistä välittääjää Baltian puumarkkinoille ei ole vielä toistaiseksi tullut.

Venäjällä on myös välittäjäporras, joka ohjaa puuvirtoja kotimaan teollisuudelle ja puun viejille. Muihin Itämeren alueen maihin verrattuna Venäjän puumarkkinoilla esiintyy selvemmin myös korruptiota, joka jääkisää markkinoiden toimintaa ja heikentää ennustettavuutta. Tämä selittää osin sitä suurta eroa, mikä vallitsee kantohinnan ja puunvientihinnan välillä.

Rakenteellisista ja maakohtaisista eroista huolimatta puumarkkinat toiminevat kohtuullisesti Itämeren alueella. Tähän viittaa esimerkiksi metsävarojen korkea hyödyntämistaste ja puun ulkomaankauppa. Mikäli maa harjoittaa puun ulkomaankauppaan, sen voi olettaa merkitsevän sitä, että puun hintaa kotimaan puumarkkinoilla ei voida asettaa esimerkiksi markkinoiden epätäydellisyystä johtuen markkinahintaa korkeammaksi tai matalammaksi. Mikäli puun ostajapuolella olisi markkinavoimaa ja hintataso asetettaisiin markkinahintaa matalammaksi, puun myyjäpuoli voisi lisätä puun vientiä. Mikäli taas puun myyjäpuolella olisi markkinavoimaa ja hintataso asetettaisiin markkinahintaa korkeammaksi, puun tuonti lisääntyisi.

### **Puu virtaa idästä länteen**

Puun kansainvälinen kauppa on kasvanut Itämeren alueella. Vuonna 1995 puukaupan määrä oli 16 miljoonaa kuutiometriä ja vuoteen 2000 mennessä puukauppa oli kasvanut 50 prosentilla 24 miljoonaan kuutiometriin. Samaan aikaan hakkuut Itämeren alueella kasvoivat vain 9 prosentilla.

Puuvirrat tulevat Luoteis-Venäjältä ja Baltiasta ja kulkeutuvat Suomeen, Ruotsiin ja Saksaan. Suomi on ollut suurin määränpää, mutta myös Ruotsiin on suuntautunut paljon puuta. Merkillepantavaa on ollut havupuun viennin

voimakas kasvu vuoden 1995 jälkeen. Saksa ei käy niinkään puukauppaa Itämeren maiden kanssa vaan Keski-Euroopan maiden kanssa.

Valtaosa Itämeren alueella käytävästä puukaupasta on kuitupuukauppaa. Baltian maista lähinnä Ruotsiin, mutta myös osin Suomeen suuntautuvat puuvirrat ovat lähes yksinomaan kuitupuuta. Baltian maissa voimakkaasti laajentunut sahateollisuus käyttää kaiken tukkipuun. Sen sijaan Venäjältä viedään sekä tukki- että kuitupuuta.

Puun kulkuvirrat tulevat tulevaisuudessa luultavimmin muuttumaan Itämeren alueella. Puun kuljettaminen lisää sen hintaa ja pidemmällä aikavälillä ensisijaiseksi vaihtoehdoksi tulee teollisuudella rakentaa puuta jalostava tehdas puun sijaintimaahan eikä viedä puuta jalostettavaksi jonnekin muualle.

### **Itämeren maista ei ole ainakaan vielä muodostunut yhtenäistä puumarkkina-alueetta**

Venäjän, Puolan ja Baltian maiden siirtyminen markkinatalouteen, kansainvälisen suuryritysten puun ostotoiminnan lisääntyminen useissa Itämeren maissa ja puun kansainvälisten kaupan kasvu Itämeren alueella ovat herättäneet ajatuksen siitä, että Itämeren alueesta olisi muodostunut yhtenäinen puumarkkina-alue. Yhtenäisellä puumarkkina-alueella puun kysynnässä tapahtuvat muutokset heijastuvat koko alueelle ja puun hinnan laskut ja nousut ovat suunnilleen yhtä voimakkaita. Tällainen puun hintakehityksen yhtenevyys vallitsee esimerkiksi Suomessa (Tilli ym. 1999), jossa eri maakunnissa puun hintakehitys on erityisesti tukkipuilla, mutta pitkälti myös kuitupuilla yhtenevää.

Puun hintakehityksen yhtenevyttä Itämeren alueella on tutkittu Mäki-Hakolan (2002, 2004) tutkimuksissa, joissa on ollut mukana Suomen, Viron, Liettuan ja Saksan puun hintoja. Tutkimustulosten mukaan puun hintakehitys tarkasteltavissa maissa ei ollut niin yhtenevää, että voitaisiin puhua Suomen kaltaisesta yhtenevästä markkina-alueesta. Sen sijaan tutkimukset antoivat viitteitä sekä mäntykuidun että kuusitukin osalla jossain määrin yhtenevistä markkinoista. Mäki-Hakolan (2004) tutkimuksessa puun hintatasojen havaittiin lähentyneen 1990-luvun loppupuolison aikana, mikä voi olla merkki kehityksestä kohti yhtenevämpiä raakapuumarkkinoita. Kaikkiaan entisen Baltian maiden, Puolan ja Venäjän puumarkkinat elävät kuitenkin vielä murrosvaihetta ja hintakehityksen

vertaaminen vakiintuneiden maiden puumarkkinoiden hintakehitykseen ei luultavimmin anna oikeaa käsitystä markkinoiden integraatiosta. Kaikista entisen Itä-Euroopan maista ei lisäksi ole saatavissa puun hintatietoja.

Puun hintataso tien varressa näyttää tutkimuksessa tehdyn vertailun perusteella olevan Suomessa kuusitukkia lukuunottamatta Itämeren alueen korkein. Kuusitukin hinta Saksassa on Suomea korkeampi. Baltian maissa hintataso on Saksaa, Suomea ja Ruotsia alhaisempi, muuta ero näyttää vuoden 1995 jälkeen koko ajan kaventuvan. Kaikkiaan hintatasojen vertaaminen Itämeren eri maiden välillä on kuitenkin hankalaa. Suomessa ja Saksassa hinnat tilastoidaan kuoren päältä ja Ruotsissa, Virossa ja Liettuassa kuoren alta. Saksassa, Virossa ja Liettuassa tilastot kattavat vain valtion myymän puun, vaikka yksityisten myymä puumäärä on myös hyvin merkittävä. Kaikkialla muualla paitsi Suomessa tilastoidaan vain hankinta-hintoja. Lisäksi puun mitta- ja laatuvaatimuksissa sekä mittaustavoissa on eroja eri maiden välillä.

Puun tilastoiduissa hintatasoissa Suomen ja Ruotsin välillä on selkeää eroa, vaikka metsänomistuksen ja metsäteollisuuden rakenne ovat hyvin samanlaiset. Yhtenä syynä hintatasojen eroon voi olla se, että Suomessa metsäteollisuuden käytämästä kotimaisesta puusta tulee suhteellisesti tarkastellen Ruotsia suurempi osuus yksityismetsistä.

### **Itämeren alue on metsäteollisuustuotteiden nettovientialue**

Paperin ja kartongin tuotanto oli Itämeren alueella vuonna 2001 yli 48 miljoonaa tonnia. Vuodesta 1995 tuotanto on kasvanut 23 prosentilla eli 9 miljoonalla tonnilta. Alueen suurin paperin ja kartongin tuottaja on Saksa, joka suuresta tuotantomäärästä huolimatta on paperin nettotuaja. Seuraavaksi suurimmat paperin ja kartongin tuottajat ovat Suomi ja Ruotsi. Paperin lisäksi myös sellun tuotanto on kasvanut Itämeren maissa. Vuonna 1995 tuotanto oli 28 miljoonaa tonnia ja vuonna 2001 tuotanto oli kasvanut 10 prosentilla 31 miljoonaan tonniin. Suomi ja Ruotsi tuottavat noin 70 prosenttia Itämeren alueen sellusta.

Sahateollisuuden tuotanto on noussut vain hiukan vuoden 1995 jälkeen Itämeren alueella. Tuotanto oli vuonna 2001 75,2 miljoonaa kuutiometriä. Tuotannon vaisun kehityksen taustalla on tuotannon erittäin voimakas lasku Venäjällä ja selvä lasku myös Puolassa. Muualla sahatavarana tuotanto on noussut. Levyteollisuuden tuotanto on suhteellisesti ottaen kasvanut

metsäteollisuuden tuotannonaloista voimakkaimmin Itämeren alueella vuoden 1995 jälkeen. Vuonna 1995 levyteollisuuden tuotanto oli 22 miljoonaa kuutiometriä ja vuonna 2001 31 miljoonaa kuutiometriä. Tuotannon kasvuksi tulee noin 40 %. Noin puolet Itämeren alueen levyistä tuotetaan Saksassa. Toinen suuri levyjen tuottaja on Puola. Levyjen tuotanto sekä Puolassa että Saksassa on kasvanut voimakkaasti.

Itämeren alueella tuotetaan metsäteollisuustuotteita selvästi kulutusta enemmän. Paperin ja kartongin tuotanto oli vuonna 2001 noin 20 miljoonaa tonnia suurempi kuin kulutus. Sahatavaraa tuotettiin vuonna 2001 noin 29 miljoonaa kuutiometriä kulutusta enemmän.

Metsäteollisuustuotteiden vienti Itämeren alueelta suuntautuu lähinnä läntisen Euroopan markkinoille. Paperin- ja kartongin osalla suurimmat viejämaat ovat Suomi ja Ruotsi. Sen sijaan sahatavaran osalla kaikki Itämeren alueen maat ovat Saksaa lukuunottamatta nettoviejä. Sahatavaran vienti on noussut vuoden 1995 jälkeen huolimatta siitä, että tuotanto on pysynyt lähes paikallaan. Vuonna 1995 vienti oli 29 miljoonaa kuutiometriä ja vuonna 2001 36 miljoonaa kuutiometriä. Viennin kasvun taustalla on sahatavaratuotannon voimakas nousu Virossa ja Latviassa. Myös Venäjällä sahatavaran vienti on kasvanut voimakkaasti huolimatta tuotannon laskusta. Suurimpia viejiä ovat Ruotsi, Suomi ja Venäjä.

### **Kasvutrendi jatkunee tulevaisuudessa, mutta painopisteet muuttuvat**

Metsäteollisuustuotteiden kulutus tulee talouskasvun myötä kasvamaan Itämeren alueella. Ennustusten valossa kaikkein reippainta kulutuksen suhteellinen kasvu tulee luultavasti olemaan transitotalouksissa eli Luoteis-Venäjällä, Puolassa ja Baltian maissa, joissa kulutuksen nykyinen taso on hyvin alhainen. Kun paperin kulutus Ruotsissa, Saksassa ja Suomessa on yli 200 kiloa asukasta kohden, on kulutus Venäjällä, Puolassa ja Baltian maissa vain noin 36-66 kiloa asukasta kohden. Paperituotteiden ohella myös sahatavaran kulutus tulee kasvamaan Venäjällä, Puolassa ja Baltian maissa. Taustalla on näiden maiden varsin heikossa kunnossa oleva asuntokanta, jota taloustilanteen parantuessa aletaan parantamaan. Metsäteollisuustuotteiden kulutus jatkanee maltillista kasvuaan lähivuosina myös Suomessa, Ruotsissa ja Saksassa. Saksassa erityisesti Itä-Saksan alue saavuttaa luultavasti läntisen Saksan elintasoa.

Myös metsäteollisuustuotteiden tuotanto tulee luultavimmin edelleen kasvamaan Itämeren alueella. Tämä johtuu siitä, että tuotteiden kulutus alueella kasvaa ja alueella on käyttämättömiä puuvaroja. Merkittävin osa Itämeren alueen käyttämättömistä puuvaroista sijaitsee Luoteis-Venäjän alueella. Hakkuita voitaisiin puuvarojen perusteella kasvattaa muuallakin, mutta metsien taloudellista käyttöä rajoittavat muut tekijät huomioiden erittäin merkittävä hakkuiden kasvu on mahdollista vain Luoteis-Venäjällä.

Eräs hyvin mahdollinen tulevaisuuden kuva on, että Luoteis-Venäjän puuvarojen jalostus tapahtuu jatkossa sekä Venäjällä että Itämeren alueen muissa maissa kuten tähänkin asti. Venäjällä voimakkaimmin tulee lähihuosina kasvamaan sahatavaratuotanto. Tähän viittaavat yritysten ilmoittamat sahateollisuuden investointisuunnitelmat. Sahauksen kasvun seurauksena Venäjän osuus Itämeren alueen sahatavaratuotannosta saattaa kasvaa tulevaisuudessa. Paperi- ja selluteollisuuden osalla tuotannon kasvu tapahtunee kuitenkin luultavimmin ainakin seuraavat 5-6 vuotta muualla kuin Venäjällä. Tuotanto kasvanee Suomessa ja Ruotsissa, jossa kapasiteetti on alikäytössä. Suomessa ja Ruotsissa osa tuotannon kasvuun tarvittavasta raaka-aineesta saatetaan tuoda Venäjältä. Myös Baltian maissa saatetaan alkaa tuoda yhä enenevässä määrin puuta Venäjältä lähinnä sahateollisuuden tarpeisiin.

Koska metsäteollisuustuotteiden kulutuksen kasvun lisäksi myös niiden tuotanto kasvaa Itämeren alueella, säilyy alue luultavimmin nettovientialueena myös tulevaisuudessa. Metsäteollisuustuotteiden kulkuvirrat kuitenkin muuttuvat 5-10 vuoden tähtäimellä siten, että Venäjä, Puola ja Baltian maat joutuvat tuomaan enenevässä määrin paperituotteita johtuen siitä, että niiden oma tuotanto ei riitä kattamaan kulutuksen kasvua. Pidemmällä aikavälillä paperiteollisuuden tuotanto ainakin osassa kyseistä maista kuitenkin kasvanee. Sen sijaan sahatavaran osalla kyseisten maiden oma tuotanto riittää luultavimmin kattamaan kulutuksen kasvun ja sahatavaraa riittää osin myös vientiin.

Edellä kuvattu kehitys kuvaa erästä mahdollista tulevaisuutta Itämeren alueella. Vaihtoehtoisia tulevaisuudenkuvia voivat olla tilanteet, joissa Venäjän taloudellinen ja poliittinen kehitys on edellä kuvattua parempi tai huonompi. Paremassa kehityskulussa Venäjän talous kasvaa ennakoitua voimakkaammin, Venäjälle tehdään paljon investointeja, Venäjä säilyy poliittisesti vakaana maana, korruptio vähenee jne. Tämän seurauksena metsäteollisuustuotteiden tuotanto kasvaa selvästi ennakoitua nopeammin

mm. ulkomaalaisten investointien turvin. Ennakoitua nopeampi taloudellinen kehitys lisää myös metsäteollisuustuotteiden kulutusta arvioitua enemmän. Kaikkiaan metsäteollisuustuotteiden kulutus ja tuotanto koko Itämeren alueella kasvavat perusvaihtoehtoa nopeammin. Myös metsäteollisuustuotteiden vienti Itämeren alueelta voi kasvaa.

Venäjän kehitys voi olla myös selvästi ennakoitua heikompi. Tällöin poliittisista ja yhteiskunnallisista ongelmista johtuen Venäjän yhteiskunta käännyy sisäänpäin, jolloin Venäjän talous alkaa supistua, investointeja Venäjälle ei tehdä jne. Tällöin on riski myös siitä, että puun vientiä aletaan rajoittaa. Tämän tyylisessä skenaariossa metsäteollisuustuotteiden kulutus ja tuotanto kasvavat hitaasti tai ei lainkaan. Kokonaisuutena Itämeren alueen metsäteollisuustuotteiden tuotanto ja kulutus jäävät Venäjän heikon kehityksen seurauksena perusskenaariota alhaisemmalle tasolle. Koska metsäteollisuustuotteiden kulutus muualla Itämeren alueella kuitenkin kasvaa, johtaa se metsäteollisuustuotteiden viennin vähenemiseen Itämeren alueelta.

### **Suomen metsäsektorin suhteellinen merkitys Itämeren alueella pienenee, vaikka sektorin kasvu Suomessakin jatkunee**

Suomen osuus Itämeren alueen puuvaroista on noin 13 %. Tästä huolimatta Suomen osuus alueen hakkuista oli vuonna 2001 noin 21 %, sahatavaran tuotannosta 17 %, paperin ja kartongin tuotannosta 26 % ja sellun tuotannosta peräti 34 %. Suomi on siten käyttänyt selvästi keskimääräistä tehokkaammin puuvarojaan. Lisäksi Suomi on osaksi puun tuonnin avulla kasvattanut metsäteollisuuttaan maan puuvaroja suuremmaksi.

Tulevaisuudessa Suomen osuus Itämeren alueen hakkuista ja sahatavaran tuotannosta tulee luultavimmin laskemaan. Suomen osuuden lasku johtuu siitä, että hakkuiden ja sahatavaratuotannon kasvu tulee luultavasti keskittymään lähinnä Luoteis-Venäjän alueelle. Sen sijaan sellun ja paperin tuotannossa Suomen osuus pysynee vielä 5-6 vuotta ennallaan, koska selluja paperiteollisuuden kapasiteetin rakentaminen Baltiaan ja Venäjälle tulee tapahtumaan selvällä viiveellä suhteessa sahateollisuuteen. Lisäksi Suomen sellu- ja paperituotanto kasvanee edelleen osin merkittävästi tuontihakkeen ja tuontipuun avulla. Mikäli Venäjän osalla toteutuisi heikomman kehityksen skenaario, Suomen osuus hakkuista ja metsäteollisuuden tuotannosta voisi

säilyä jotakuinkin ennallaan johtuen siitä, että Itämeren metsäsektorin kasvu aikalailla pysähtyisi.

Itämeren alueen metsäsektorin vaihtoehtoisia kehityskulkuja tullaan tarkastelemaan tarkemmin jatkotyössä, jossa arviodaan metsäsektorin kehitystä vuoteen 2010 mennessä. Tässä yhteydessä tarkastellaan myös vaihtoehtoisten kehityskulkujen vaikutusta erityisesti Suomen metsäsektorille.

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