

## **Transformations of the Global Forest Products Sector: Drivers, Effects and Response**

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### **1. Drivers of Change in the Global Forest Sector**

The global forest sector has witnessed tectonic shifts over the past quarter of a century. The transformations have been driven, at a macro level, by the combined forces of population growth and urbanization, economic globalization, advances in information and communication technologies, the surge of climate change and sustainable energy uses as burning issues, and an array of environmental and social trends.

**Table 1. The World's Population in Benchmark Years and Annual Growth Rates**

	Population (million)						Annual growth rate during the period (%)				
	1980	1990	2000	2005	2025*	2050*	1980-1990	1990-2000	2000-2005	2005-2025	2025-2050
Africa	470	622	796	906	1349	1969	2.86	2.49	2.63	2.01	1.52
Asia	2632	3168	3680	3921	4759	5325	1.87	1.51	1.28	0.97	0.45
Europe	692	722	728	730	716	660	0.41	0.09	0.06	-0.10	-0.33
Oceania	23	27	31	33	41	46	1.57	1.52	1.23	1.09	0.46
Northern America <sup>1</sup>	256	284	316	329	386	457	1.02	1.09	0.81	0.80	0.68
Latin America <sup>2</sup>	361	442	520	559	702	805	2.02	1.65	1.45	1.15	0.55
Developed countries	1126	1198	1249	1268	1314	1306	0.62	0.41	0.31	0.18	-0.02
Developing countries	3308	4065	4822	5210	6639	7956	2.08	1.72	1.56	1.22	0.73
World	4435	5264	6071	6477	7952	9262	1.73	1.44	1.30	1.03	0.61

<sup>1</sup>Northern America includes Canada and USA.

<sup>2</sup>Latin America includes Mexico, Central America and South America.

\*Projected.

Data source: 2005 World Population Data Sheet. Annual growth rates were calculated by the author. The numbers may not add up, due to rounding.

Demand growth for forest products and services is determined by multiple factors, and demographic change is one of the most important drivers. As shown in Table 1, from 1980 to 2005, the world's population increased by 46%, or an annual growth rate of 1.53%. The growth rates in the developing world were significantly higher than those of the developed countries, with Africa witnessing an annual increase of 2.67%, Latin America 1.76%, and Asia 1.61%. At present, the world's population has surpassed 6.5 billion and is expected to exceed 9.3 billion by the middle of the 21<sup>st</sup> century. The demographic effect alone will bring about significant changes in global demand for forest based goods and services.

The 20<sup>th</sup> century witnessed a rapid urbanization of the world's population. Globally, the urban population increased from 220 million (13%) in 1900 to 732 million (29%) in 1950, and 3.2 billion (49%) in 2005, thus more than quadrupling since 1950. The year 2008 represents a milestone because, for the first time in human history, more than half of the world's population are living in urban centres (see Figure 1). It is projected that 4.9 billion people, or some 60% of the world's population, will be living in cities by 2030 (United Nations 2006). With these unprecedented urbanization trends, first in the industrialized countries, and now among emerging economies, forest related development and utilization have been shifting in the interests of meeting the growing demand of city dwellers for a great variety of forest based products and services.

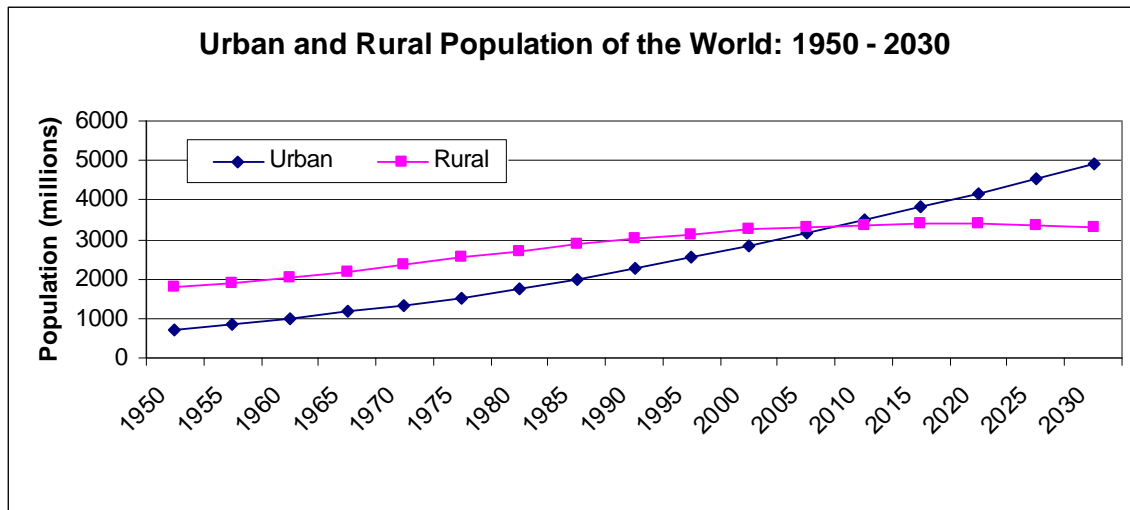


Figure 1. The world's urban and rural population trends: 1950 – 2030.

Another important agent of change is globalization. Broadly, globalization is described as '...a widening, deepening and speeding up of worldwide interconnectedness in all aspects of contemporary social life...' (Held et al. 1999: 2). The term 'globalization' is often used to refer to economic globalization, which means a greater global connectedness of local livelihoods and production processes through trade in goods and services across international borders. The significant growth of international trade in major forest products is a clear indication of an accelerated pace of globalization. As a result, tree farms, lumber yards, pulp and paper mills, and other forest businesses are increasingly knit into a global economy.

## 2. Global Forest Products Sector in Transformation

The major shifts of the global forest products sector have unfolded over the past quarter-century, as indicated in Table 2. Since 1980, the world's forest products production has witnessed the following trends: (i) a marginal increase, by some 20%, in roundwood production, and an 18% increase in industrial roundwood; (ii) stagnant levels of sawnwood output; (iii) a moderate increase in wood pulp production; (iv) a significant growth in wood-based panels and paper products, more than doubling over a two-decade period.

**Table 2. The World's Forest Products Production and Exports**

	1980		1990		2000		2005	
	Output (million m <sup>3</sup> /tons)	Exports- output ratio (%)	Output (million m <sup>3</sup> /tons)	Exports- output ratio (%)	Output (million m <sup>3</sup> /tons)	Exports- output ratio (%)	Output (million m <sup>3</sup> /tons)	Exports- output ratio (%)
Roundwood	2,928.9	4.0	3,506.6	3.4	3,352.5	3.5	3,502.7	3.8
- Ind. RW	1,451.5	7.9	1,672.5	6.9	1,586.5	7.2	1,710.6	7.5
Sawnwood	451.3	17.7	505.7	17.6	421.0	30.4	428.5	31.7
W-B panels	101.0	16.2	123.4	24.7	189.3	29.5	234.8	34.3
Wood pulp	125.8	16.8	155.6	16.2	171.3	22.1	173.9	24.5
P&P	170.3	20.6	239.1	23.3	323.1	30.2	354.1	31.9

Source: FAO Forest Products Yearbook, various editions. The ratios of exports over output are calculated by the author.

In terms of regional distributions, North America and Europe remained as the dominant producing regions for wood pulp, sawnwood and industrial roundwood. Asia has gained importance in the production of wood-based panels and paper products, accounting for one third of the world's output in these two categories in 2005. South America and, to a lesser extent, Oceania have increased their respective share of the world's production of wood pulp, industrial roundwood and sawnwood.

Table 3 shows that, proportionally speaking, Europe as a continent has declined in virtually every major category of products, while North America has made a slight gain in sawnwood and industrial roundwood only. The production of wood-based panels and paper products has gravitated towards Asia where demand growth has been strong over the past two decades. The production of pulp and other wood-based materials has been shifting to the southern hemisphere where production costs are lower than in the northern hemisphere. This shift is known as 'Pulping the South' in the circle of forest industries. Meanwhile, economies in transition have invested heavily in local manufacturing in an effort to derive more value from their forest resources. Furthermore, end products are increasingly made with inputs from different geographical regions.

Global patterns of forest products consumption have also experienced significant changes. On a per capita basis, the production of industrial roundwood, lumber and wood pulp has either stagnated or declined since the 1990s, while wood-based panels and paper products have grown steadily, on account of a rising standard of living in many parts of the world.

**Table 3. Regional Distribution of the World's Total Forest Products Output (%)**

	Nordic Europe <sup>1</sup>	Russia <sup>2</sup>	Canada	ABC countries <sup>3</sup>	Oceania <sup>4</sup>
<b>Industrial roundwood</b>					
1980	6.0	19.1	10.6	5.1	1.9
1990	5.2	17.8	10.2	5.4	1.9
2000	6.7	6.7	11.5	8.5	3.0
2005	8.1	8.2	11.5	9.4	2.9
<b>Sawnwood</b>					
1980	4.8	21.8	9.8	4.0	1.3
1990	3.9	20.8	10.9	4.3	1.1
2000	6.8	4.8	16.5	6.0	1.9
2005	7.1	5.1	14.1	7.8	2.2
<b>Wood-based panels</b>					
1980	3.6	10.5	4.8	2.9	1.2
1990	2.1	10.3	5.2	2.9	1.4
2000	1.5	2.5	7.7	5.4	1.9
2005	1.2	3.5	7.2	4.7	1.8
<b>Wood pulp</b>					
1980	12.7	7.0	15.9	3.3	1.4
1990	12.2	6.7	14.8	3.7	1.5
2000	14.1	3.5	15.5	6.1	1.5
2005	13.4	4.0	14.6	7.9	1.6
<b>Paper and paperboard</b>					
1980	7.1	5.1	7.9	2.6	1.2
1990	7.2	4.5	6.9	2.6	1.2
2000	7.5	1.6	6.5	2.6	1.2
2005	6.8	2.0	5.6	3.1	1.2

Source: Calculated on the basis of FAO's Forest Products Yearbook, various editions.

<sup>1</sup> Referring to Finland and Sweden.

<sup>2</sup> Referring to the former USSR for the 1980 and 1990 benchmark years.

<sup>3</sup> Referring to Argentina, Brazil and Chile.

<sup>4</sup> Referring mainly to Australia and New Zealand.

The newsprint market in the United States saw a structural break in the late 1980s. It is the first major example of a communication paper market where the long-term positive relationship between paper consumption and economic growth no longer holds. In recent years, many OECD countries have witnessed a trend toward favouring digital media at the expense of print media, and the substitution effects will likely strengthen with time (Hetemäti 2005).

International trade in forest products has become increasingly globalized since the early 1990s. As shown in Table 2, the trends of globalized trade are especially evident with respect to sawnwood, wood-based products, paper and paperboard, and wood pulp. Global trade in forest products has shifted in such a way that traditional exporting countries such as Canada, Sweden and Finland are now competing with emerging forestry powerhouses like New Zealand, Chile and Brazil in virtually all major markets. As Table 4 shows, while Finland and Sweden still retain their competitive advantage in paper products, as does Canada in lumber, the emerging forest nations in the southern hemisphere are becoming increasingly competitive in wood pulp and solid wood products. While the United States and Europe are two of the largest markets for forest products, East Asia has become the world's largest net importing region for forest products and, within this context, China has surpassed Japan to become the world's largest log importing nation since 2000. Thanks to its unprecedented economic growth, China has seen rapid demand growth for imported lumber and wood pulp.

**Table 4. Ratio of Net Exports or Net Imports over Total Output (%)**

	Industrial roundwood	Sawnwood	Wood-based panels	Wood pulp	Paper & paperboard
Canada					
1980	0.7	62.5	23.1	35.6	69.4
1990	-0.7	66.3	30.2	33.5	66.3
2000	-1.1	69.6	64.3	43.6	61.2
2005	-0.5	63.8	69.8	40.5	64.8
Finland					
1980	-4.5	67.3	57.9	26.3	81.3
1990	-13.6	54.8	51.1	15.5	85.5
2000	-18.7	60.5	66.8	12.3	83.5
2005	-32.4	58.3	62.6	15.8	86.2
Sweden					
1980	-7.2	49.4	22.2	34.5	71.9
1990	-7.8	49.9	-19.7	26.0	74.5
2000	-18.4	72.2	-28.5	24.0	77.0
2005	-6.1	64.2	-103.2	25.3	83.1
Brazil					
1980	-0.1	2.3	9.5	26.9	-1.9
1990	-0.2	1.2	19.8	22.5	12.5
2000	0.7	12.3	17.5	36.5	0.0
2005	0.1	14.0	38.5	48.5	11.2
Chile					
1980	12.8	56.5	27.8	54.5	9.0
1990	40.7	38.7	34.1	72.3	12.6
2000	2.8	30.2	36.6	70.8	6.6
2005	0.8	30.9	67.2	80.3	12.0
New Zealand					
1980	14.1	28.9	35.7	41.5	41.4

1990	24.5	26.0	50.8	49.7	28.8
2000	30.5	38.3	48.3	41.8	20.7
2005	26.9	41.3	49.4	52.2	20.0

Source: Calculated on the basis of FAO's Forest Products Yearbook, various editions. Numbers represent percentage, with a negative sign indicating a ratio of net imports over total output.

### **3. Response to Change from Traditional Forest Nations**

The scale of transformations in the global forest sector has far-reaching implications for forest nations in the northern hemisphere, especially Canada, Finland and Sweden. In response to these major shifts, the Nordic countries have moved quickly to enhance their global competitiveness by intensifying the clustering of forest research capacities and operations, increasing investment in higher value added products, as well as securing new markets.

Overall, the contributions of the forest industry to the national economy have been declining in the traditional forest nations. For example, in Finland the downward trend is clear, due to a so-called "Nokia effect". The IT sector has grown tremendously in the past decade or so, and a few years ago Nokia alone accounted for about 3% of Finland's GDP. In response to the changes, leaders of the Finnish forest sector recognized the importance of intensifying investments in innovation. In the late 1990s, a forest cluster research program called Wood Wisdom was launched, which was funded through the Ministry of Agriculture and Forestry, the Ministry of Trade and Industry, as well as the National Technology Agency of Finland. The objective of the program was to strengthen the knowledge base in the forest cluster across national borders and to promote the transfer of knowledge and technology for improving the competitiveness of the whole cluster (see <http://www.woodwisdom.fi/>). The success of the Wood Wisdom program set the stage for a Finnish-Swedish Wood Material Science and Engineering Research Program (2003-2007), which aimed at enabling development of innovative sustainable products, processes and services. These initiatives are good examples of Nordic Europe's efforts to keep the forest sector moving forward.

Finland's success may be attributed to a number of factors, including 1) the continuous process and product innovation since the 1980s that gave the forest industry the economies of scale; 2) the strategy to move from bulk products to value-added ones, which benefited from efforts in product innovation; and 3) the strategy to start relocating production capacities to major customer countries (initially Germany, UK, France and, more recently, China and other places).

Compared to Nordic Europe, Canada has faced similar but, perhaps, greater challenges. Apart from a global shift in production bases and markets, social and environmental trends have increased the costs of timberland management and forest products manufacturing. In recent years, the softwood lumber dispute with the US and a high

Canadian dollar, along with high energy costs, have undercut the advantages of the Canadian forest industry by lowering the competitiveness of many Canadian companies.

The Canadian response is characterized by repositioning the country's forest products sector through programs that seek to boost investment in research and development, with a focus on transformative technologies. The recent merging of Feric, Forintek and Paprican into a single national forest products research institute known as FPInnovations and the creation of the Canadian Wood Fibre Centre serve as public-private-partnership vehicles for implementing a new strategy that aims at enhancing the innovative capacity of Canada's forest sector and increasing economic efficiency along the entire forest products value chain (Bruemmer 2008).

#### **4. Concluding Remarks**

The global forest products sector has been transformed, thanks to the dramatic changes that have taken place over the past quarter of a century. Rapid population growth and increasing urbanization, economic globalization and technological advances have reshaped the patterns of global forest products production, consumption and trade. Recently, an increasing number of countries view forest biomass as a partial substitute for declining supplies of geologically stored fossil fuels (Salonius 2007). While wood is becoming the new oil in some parts of the world, the markets for food, fibre and fuel begin to reveal signs of rapid convergence (Roberts 2007).

Leaders of the global forest sector are facing a great challenge of seeking to respond to the population's greater needs for forest products while striving to maintain the many functions of forest ecosystems. It is clear that forest industries will have to climb the technology ladder to compete successfully. Specifically, companies will need to pay close attention to the ongoing global readjustment in relations between the world's forests, the producers of intermediate and end products, the consumers, and the markets through which various products flow. Changing public perceptions and environmental values will greatly influence the way forests are managed and products and services are delivered.

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