GLOBAL FIBER RESOURCES SITUATION "THE CHALLENGES FOR THE 1990s"

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Forest Industry Lecture Series

Forestry Program
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Edmonton, Alberta
CANADA
T6G 2H1

28 February 1995

FOREST INDUSTRY LECTURE NO.34

THE FOREST INDUSTRY LECTURERS

The forest industry in western Canada cooperates with Alberta Environmental Protection to provide funds to enrich the Renewable Resources program at the Faculty of Agriculture, Forestry and Home Economics at the University of Alberta through sponsorship of noteworthy speakers.

The Forest Industry Lecture Series was started during the 1976-77 term as a seminar course. The late Desmond I. Crossley and Maxwell T. MacLaggan presented the first series of lecturers. The contribution of these two noted Canadian foresters is greatly appreciated.

Subsequent speakers in the series have visited for periods of up to a week, with all visits highlighted by a major public address. Visitors have come from throughout North America, Europe, Africa and Asia. Their talks have dealt with a wide range of topics, such as forest ecology, forest science, silviculture, wildlife, forest management, ecosystem management, industry, services and trade, economics and social issues. Speakers have been drawn from among scientists, industry and business leaders, senior government officials, academics and forestry alumni. A full list of these electric topics and speakers is included at the end. Copies of most of their papers are available on request.

This paper contains James A. McNutt's major public address given on 28 February 1995.

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JAMES A. McNUTT

Dr. James A. McNutt has been affiliated with the paper industry since 1975 when he was a Professor of Forest Engineering at the University of Washington. Since then he has held positions as Corporate Forest Economist and Senior Financial Analyst at Potlatch Corporation; Manager of Regional and Corporate Planning for field level timber and wood products at Container Corporation of America; Senior Line Manager for all timber and wood products operations at Jefferson Smurfit Corporation; and Director of Corporate Planning at Great Northern Nekoosa Corporation. Dr. McNutt joined Jaakko Poyry Consulting, Inc. in June of 1990 as Executive Vice President, and in the summer of 1993, Dr. McNutt assumed his current position as President andCEO.

Dr. McNutt received a BS degree in Industrial Engineering from the University of Wyoming; an MBA from the College of William and Mary; and an MA and a PhD in Forest Managerial Science from Oregon State University.

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THE GLOBAL FIBER RESOURCES SITUATION

"THE CHALLENGES FOR THE 1990s

KEY OBSERVATIONS AND CONCLUSIONS

The world's forests are under ever increasing pressures to provide fiber. At the same time, there are major changes in the volumes and types of wood available to meet these demands. The combination of factors is seen in localized and, less frequently, regional timber supply shortages or supply and demand discontinuities. These emerging discontinuities are projected to continue on in to the 21st Century, and will be the result of a range of factors including:

withdrawal or reductions of cutting rights,

- past overcutting and alternative land use impacts,

lack of investments to increase productivity, including required reforestation, and

lack of infrastructure to cost effectively harvest and transport timber.

These imbalances will be especially evident in the Asia Pacific region. The changing timber supply and demand picture will affect the basic structure of the forest products industry around the world. More specifically:

Growing populations will increase demands for fiber and forest products.

- The theoretical cutting potential for the world's forests exceeds the projected demand for timber.

However, the noted limitations with respect to the available harvest and transportation infrastructure and continuing environmental pressures have and will continue to reduce the area of forest land that is

economically available for harvesting and will constrain management of timber resources that are available. This will in turn escalate the supply/demand discontinuities over the long-term.

The availability of wood from the major supply areas of the North American Pacific Coast (softwood), and South East Asia (hardwood), which have historically provided a significant proportion of fiber to the Asia Pacific market, is declining and the impact is beginning to affect this key market.

Russia's vast softwood supply potential is restricted because the country lacks an efficient harvest and transportation infrastructure making it unlikely that the level of harvest will increase significantly over the time frame of this study. Consequently, these resources will not be available to satisfy the increased demand from European and Asian Pacific markets. As well, the required investments to effectively utilize this resource are substantial, an indication that the long-term cost of supply from this area will be much higher than is indicated by the apparent low cost environment.

Population growth in Asia Pacific, as well as increasing per capita consumption of forest products will together stimulate solid demand growth in this market over the long-term. This will compound an existing significant domestic fiber deficit.

Timber supplies from fast growing plantations are increasing, however these increases are roughly equal to the projected marginal increases in demand, and therefore will not compensate for projected declines in the availability of fiber from the traditional supply centers.

Higher levels of recovered fiber have reduced demand increases for virgin fiber in the pulp and paper industry over the past several years. However, long-term, growth in the use of recovered fiber will be limited to meeting only the anticipated growth rates in marginal demand for end products. Consequently, recycled fiber will not mitigate timber cost increases

as has been the case over the past decade.

Accelerating changes in historical tariff and trade barriers resulting from new trade agreements (NAFTA, GATT, the EU) and relaxed trading constraints will further stimulate the trend toward a true global trading economy for fiber.

Together, these changes will elevate the relative importance of fiber supply, quality, cost, and control. In this light, these developments will have a long lasting and significant affect on the structures and directions of the global forest products industry.

THE PRESENT SITUATION — SUPPLY

The world's forest resource base is facing steady demand pressures as a consequence of the increase in human population. Trendlines indicate the world's population could double over the next 35 years. Within the long-term time frame of this study, expectations are for an increase of about 20 percent, with the greatest growth in the developing nations (Figure 1).

The demands for wood and forest products will increase with rising populations and as standards of living improve within the next decade. As the economies of these emerging nations develop, Asia Pacific in the short-term and Eastern Europe in the long-term, there will be an increase in per capita consumption of forest products and growth in demand. At the same time, new supply discontinuities have been emerging. Increasingly, the resulting resource conflicts will affect the forest industry's ability to secure low cost supplies of quality timber on into the next decade and beyond.

FOREST RESOURCES, LOCATION AND TRENDS IN UTILIZATION.

Closed forests cover an area of nearly three billion hectares (1 hectare = 2.5 acres) (Figure 2). There are a few recognizable major supply regions for industrial wood:

- Coniferous forests, located mainly in Eastern Europe (primarily Siberia), Canada, and the US, comprise only 40% of the total area of closed forests (Figure 3), but supply approximately 70% of the global supply of industrial wood (Figure 4).
- Hardwood forests make up 60% by area and yield 30% of industrial wood supplies. These mainly tropical forests are located in South East Asia, South America and Africa.

FOREST UTILIZATION.

The theoretical cutting potential[1] of the world's forests greatly exceeds the rate at which timber is being harvested. For example, in the northern temperate and boreal zones alone, the cutting potential exceeds removals by 600 million m^3 annually. However, this theoretical potential cannot be realized because of the influence of competing demands on forests and logistical problems (Figures 5 and 6).

Increasingly strict environmental codes and other institutional constraints, rather than biological yields, now limit the level of harvest from the Pacific Coast of North America. Increased wood removals are possible in the US South. However, additional investments are required to increase the

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1 Cutting Potential = The theoretical annual volume of logs and pulpwood available for harvest from productive forest land minus volumes from areas formally set aside due to legislative, regulatory and other types of constraints.

productivity of non-industrial private (NIP) forests before the level of harvest can be increased substantially. And, even if this is possible, such increases would not likely materialize for 10-20 years.

In Europe, cutting potentials and removals are relatively balanced, although there is some potential to increase removals from the Nordic countries in the short-term and Western Europe in the long-term.

In contrast, while Siberian Russia has substantial unrealized cutting potential, it will remain largely untapped because of environmental, institutional, infrastructural, social and management related constraints. Over the past 3-4 years these problems have actually reduced the volume harvested in Russia and other CIS countries. Also compounding this situation is the need for massive capital investments to effectively tap this supply source, which in turn will affect the long-term cost competitiveness of fiber supplies from this region.

Most of the 150 billion m^3 of growing stock in the tropical hardwood forests either has low productive potential, or is presently commercially inaccessible. For areas once considered accessible, such as South East Asia, the volume of hardwood logs harvested from tropical forests has already been greatly reduced, and this trend is predicted to continue over the foreseeable future. Environmental pressures to limit harvesting in the Latin American tropical forests have been effective in reducing the level of harvesting in these forests as well. Existing plantations will be the only significant source of increased future removals from this region.

Little uncommitted surplus fiber is available in the immediate- to short-term from fast growing plantations, located mainly in the Southern Hemisphere (Oceania, Asia Pacific and Latin America). Therefore, fiber from these emerging supply centers will not significantly compensate for diminishing supplies from the traditional supply sources (Figure 6). The emerging role of these plantations as a fiber supply source requires careful examination. For example, while over 100 million

hectares of plantations have been established (Figure 7), the vast majority are small, or off-site plantings in China that are very unlikely to contribute significantly to long-term fiber supplies in the next decade. (Figure 8).

The long-term, projected 1.7 billion cubic meters of industrial roundwood removals will only partially be provided for from fast growing plantations. In terms of actual removals, these new supply arenas presently provide around 8-10 percent. Therefore, although the yield from fast growing plantations will meet a proportion of predicted future roundwood requirements (Figure 9), the volumes available will not overcome the emerging world-wide timber supply/demand discontinuities (Figure 10).

PRESENT SITUATION -- DEMAND

More than half (55%) of all roundwood removals is used as fuelwood, mainly in the developing regions of Asia, Africa and Latin America Figure 11). Of the remainder, sawlogs and roundwood pulpwood account for 30% and 15%, respectively. Most demand for solid wood and paper products comes from the developed regions of the world.

FIBER BASED PRODUCTS DEMAND DRIVERS.

The key demand drivers, (Figure 12), for fiber based products for today can be identified as:

persistent global population growth and related new consumption pressures,

forecasts of rapid economic growth for the Asia Pacific region and associated per capita consumption of forest products,

• emergence of other developing countries with new demand requirements,

fundamental changes in the economic growth of Eastern Europe, ultimately leading to higher consumption levels,

stability of developed countries' economies and associated incremental growth in demand, and

•development of new wood fiber based products, and therefore new markets and associated their demands.

Between 1960 and 1990, the total production of logs, pulpwood and fuelwood increased by 1.3 billion m^3 (around 48 billion cb ft) which is equivalent to an average annual growth rate of 1.8%. An average annual growth rate of 1.3% is predicted over the long-term (Figure 12), with the fuelwood component accounting for most of the growth (Figure 13).

Softwood log production is expected to increase by approximately 90 million m^3 (4 billion cb ft) through the long-term. (Figure 14). Major trade flows of pulpwood are presently from the Pacific Coast of North America to the Asia Pacific market, (Japan), which also draws relatively minor inflows from Siberia and Oceania. Current European demand is met from inter-regional flows (Figure 15). A similar pattern is shown for existing pulpwood trade flows (Figure 16). Over the course of this study's time frame, demand for pulpwood is predicted to increase by 2.5 % per annum (Figure 14).

Higher rates of use of recovered fiber have moderated the rate of increase in pulpwood demand over the past several years. Since the 1980s, recovered fiber has increased as a proportion of the total fiber used to make paper (Figure 17). However this trend will abate during the next few years for technical reasons, as recovered fiber reaches approximately 40% of the furnish (Figure 18). Even though wood has recently decreased as a proportion of the fiber

input per unit of paper produced, overall demand for pulpwood has still increased, because demand for paper has increased at higher rates.

Hardwood log production is expected to remain relatively stable over the long-term (Figure 13). Figure 19 underscores the significant supply role played historically by the tropical hardwood forests in South East Asia and Africa in meeting demands in Asia Pacific and Europe respectively.

Relative timber costs are also changing. Aside from recent rises in real prices for delivered timber in most regions, there has been a narrowing of worldwide regional log prices since the early 1970s. The gap between high and low cost producers is closing. Consequently, timber, as a primary raw material, is beginning to be traded worldwide as a commodity, much like market pulp, where price differences are increasingly dictated by transportation and handling issues and costs (Figure 20).

This directional trend is also being stimulated by the continued relaxation of historically restrictive tariffs and other related trade barriers. For the low cost softwood pulpwood regions, the current situation highlights the current relative cost advantage of the new supply regions of the fast growing plantations. These differences are expected to diminish over the long-term as trade barriers relax further and demand for timber in these emerging supply regions stimulates more open market related increases in delivered wood costs (Figure 21).

Other changes will occur as a consequence of environmental issues. Increasingly, producers will have to demonstrate "sustainability of origin" certification. In addition, voluntary initiatives and declarations will affect specific timber supply arenas, such as the tropical hardwood areas of the world.

These ***official*** processes are being compounded and stimulated by unofficial processes promoted by Non-Governmental Organizations (NGOs) (Figure 22). NGO actions are affecting the way products are being manufactured, how forests are managed, and where, how, and when timber

can be removed for industrial use. The combined effects of official and unofficial processes are at the root of many of the current timber supply and demand discontinuities, and they will play an increasingly important and restrictive future role.

WORLD SUPPLY DEMAND BALANCE -- THE EVOLVING STORY

Viewed globally, current removals are well below theoretical cutting potentials. However, there are considerable differences when viewed regionally. Despite gradually improving cutting potentials around the world, the continued growth in log and pulpwood removals will close the gap between the actual cut and any projected levels of theoretical cutting potential (Figure 13).

Major changes in global forest utilization and business approaches will be needed over the long-haul to meet the expanded harvest of logs and pulpwood.

Major changes in supply sources and trade flows will evolve, as fiber from emerging and under-utilized sources is substituted and/or added to that from traditional supply arenas (Figures 23 and 24).

The current fiber supply problems of the Pacific Coast of North America, continued failure of the Russian/CIS supply system, sharp declines in the South East Asian harvests of tropical hardwoods, and other major discontinuities in supply have created the need for new fiber sources. These additional supplies will need to come from non-traditional, less accessible and/or less economically attractive sources in the future.

Increasing pressures on the traditional sources of supply, coupled with intensified utilization of other un affected areas.

• The production of softwood logs is expected to grow to a level exceeding 720 million m^3 (155 billion bf) over the long-term, which is close to the peak level of 1990. Predicted increases in the level of removals will further narrow the gap between actual cuttings and the cutting potential.

Regions will vary significantly in their capacities to sustain increased removals. The Nordic countries, Western and Eastern Europe, and Oceania have the theoretical capacity to significantly increase removals. Japan also has a theoretical capacity to increase removal levels, but this is not likely to materialize for reasons discussed later. In other regions of the world, the Pacific Coast of North America included, additional constraints on fiber supply are projected within the next decade.

The growing shortfall in North American softwood log supplies will be made up by increased harvesting in other major wood producing regions, particularly in Western and Eastern Europe, the Nordic countries and softwood resources in the Southern Hemisphere. The Japanese resource, though presenting the potential for increased utilization, is not expected to account for a major increase in the production of softwood logs during the monitored time period. This is due to high log costs, forest ownership patterns and labor constraints.

The impact of the expected shortfall in the North American softwood log production is significant in the world trade perspective. Of particular importance is the log supply situation in Japan and the other Asian Pacific countries that are highly dependent on North American log exports, with a softwood log deficit in 1993 of 24 million m^3 (5.3 billion bf).

Removals of hardwood logs are expected to increase above 300 million m^3 (65 billion bf) over the long-term, exceeding the peak level of 1990. However, despite the predicted increase, removals will still not exceed theoretical cutting potentials. Major regional variations in hardwood log

production are expected. Forests in South America and Eastern Europe will be required to increase their share of world production.

The South East Asian countries have historically been the only region in the world with a significant hardwood log surplus. Therefore, the anticipated reduction in removals from these regions will have a considerable impact on the world hardwood log supply/demand balance and trade flows. This will be especially evident in the Asia Pacific region, which is the major hardwood log deficit area and has few alternative sources of supply.

In general then, major changes are predicted for the production and global trade of logs, which will result in:

increasing delivered wood costs,

increasing global trade to offset regional imbalances in supply and demand, and

increasingly constrained supplies of hardwood logs to the Asia Pacific region.

REGIONAL SUPPLY BALANCE

ASIA **PACIFIC REGION -** AN INCREASING **WOOD** DEFICIT AREA.

The net fiber supply/demand balance within the Asia Pacific region will begin to deteriorate rapidly in the next few years, as the commercial forest land base of traditional supply regions is reduced. At the same time, consumption of forest products is increasing because of the expanding population and booming economies in countries outside the major economic centers of Japan, Taiwan and Korea (Figure 25). In fact, the net projected wood product demand in the Asia Pacific region, as

measured against known supply sources, indicates a significant deficit for forest products and fiber-based raw materials (Figure 26).

When put into the context of the entire Pacific Rim, the predicted deficit of roundwood alone goes from nearly 40 million cubic meters early in the immediate-term, to a deficit of more than 60 million cubic meters in the long-term (Figure 27).

However, with many of the traditional supply areas reducing harvest levels, and the fast growing plantations only able to meet a proportion of this growing demand, the Asia Pacific market will be forced to draw on an ever widening supply zone. In the end, meeting the demand in this market will have repercussions for local and regional wood products markets around the world.

The increasingly global nature of these developments can be illustrated by evaluating the options open to Japan to replace softwood supplies previously obtained from the Pacific Coast of North America. The impending softwood pulpwood fiber deficit is unlikely to be met from Russia because of myriad supply problems, or from the fast growing plantation resource, because these resources are mostly committed. The US South then emerges as among the most attractive sources of softwood fiber to meet this increased demand (Figure 28). Similar trends are likely for hardwood pulpwood (Figure 29). This can have significant implications for the efficient open-market fiber supply sources of the US South, especially those of the NIP forests.

The consequences for markets that have experienced this type of intervention can be illustrated by the New Zealand softwood log price index experience (Figure 30). The index shows the volatility of the market since the Japanese entered the market aggressively in 1987. Similarly, the more traditional timber markets, such as that for North America, will also become more volatile in the in the near future, with higher real price trend lines and disruptions in raw material supply.

As the traditional markets, such as in North America, begin to reflect such price movements, other global timber supply arenas with export potentials will experience increased prices for the same reasons. Therefore, the increasing globalization of these demand pressures will likely limit any major relative changes over the long term.

Furthermore, the evolution of new trade agreements (NAFTA, GATT, the new EU) and the relaxation, in general, of historically restrictive tariffs and other related trade barriers will work in concert with the global spread of more uniform demand pressures. The net effect will be that any local supply/demand/ price discontinuities will tend to abate over time, as demand reaches other major competing global timber basins and begins to drive prices upward more uniformly.

KEY REGIONS/PRODUCTS/FOCUS/IMPLICATIONS

The major supply areas for the Asia Pacific markets, as has been noted, have been the Pacific Coast of North America (softwood logs) and South-East Asia (hardwood logs). Reductions in raw material supply from these areas will impact local, domestic, and global markets. These impacts will result in or from:

- significant reductions in the volumes of timber considered to be economically available at current price levels,
- more complex commercial timber management structures,
- more multiple end-use demands,
- increasing land and timber values/costs,
- new Southern Hemisphere supply areas with existing plantations are helping somewhat in the immediate- and short-term to moderate discontinuities, but in the longer-term their potentials

will be limited without significant new investments,

• evolution of substantial changes in world timber trade balances, and

• setting the stage for Asia Pacific to lead global fiber supply pricing.

GENERAL LESSONS TO BE LEARNED

Overall then, as the 21st Century approaches, the timber supply environment of the past several decades is expected to undergo major pressures and changes. The expected demand drivers (Figure 31) will encompass issues involving population growth, end-products developments in Asia-Pacific, per capita increases in developing countries, the emergence ultimately of Eastern Europe as a demand center, the stability of the developed countries' economies and demand structures, and the emergence of new technologies that will affect both markets and demand structures.

Yet, at the same time, the forest products industry will face serious new timber supply restrictors (Figure 32). Among them are the timber supply chaos of Western North America, continued failure of the Russian/CIS supply system, major declines in tropical hardwood supplies, exploding alternative land use demands, ever increasing costs of timber resource development, lost industry fmancial/balance sheet strength/flexibility, growing restrictions on public land uses, and inability to move non-industrial landowners towards better forest resource management practices in all corners of the world.

Some potential supply enhancers must also be considered, however (Figure 33). For example, the new, non-traditional supply arenas, such as the fast growing plantations, will mitigate certain levels of supply deficiencies. Also potentially important, will be new timber growth technologies, higher timber prices, continued emergence of recovered fiber supplies, developing countries investment

stimulators, new improved timber delivery infrastructures, continuation of privatization of selected timber basins, and the potential increased participation in the supply development process of the non-industrial private landowners.

These demand drivers, moving in concert with supply restrictors, are collectively creating serious global timber supply and demand discontinuities for the next 5-10 year period (Figure 34). The net effect is that the "certain" world of yesterday's timber supply environment will not exist for our expected tomorrow's. In short, in certain circles, the great fiber scramble already seems to be underway, as fiber control is emerging as a major forest products industry consideration for the next decade.

How the forest products industry positions itself in terms of timber supply, cost, and quality control issues may be crucial elements for success in the balance of the 1990's and on into the 21st Century (Figure 35). In short, timber is a now issue. Fiber ownership and control considerations will affect directly each company's potential successes over the next decade.

The various aspects of fiber control concessions will be affected by a wide variety of key issues (Figure 36). How the forest products industry responds to them will essentially compose its "Global Fiber Resources Challenge for the 1990's".

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