Globalization in the Wood Products Industry: Some Important Trends

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Dynamic Changes Occurring in the Global Forest Economy

- Changes occurring are often not favorable to much of North American forestry in the long-run.
- Change inherently generates disruptions and dislocations.
- But, likely to be broad economic and environmental benefits and some newly emerging “niche” market opportunities in the long-run.
Provide an Overview

- Of Production Changes Effecting the Global Supply of Forest Resources
- Global demand for wood products
- Some environmental implications
- Issues and implications for the wood industry both regionally and nationally
Major Changes: Supply and Demand

- Forestry in transition from foraging to cropping mode
- Opportunity to introduce technologies, both growing and harvesting
- Are seeing locational restructuring of the Forest Industry
  
  also

- Major Changes in the Market: Damping of Growth
# Table 1: Long-term Transition in Forest Management and Harvests

<table>
<thead>
<tr>
<th>Type</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild forests</td>
<td>10,000 BC – present</td>
</tr>
<tr>
<td>Managed forests</td>
<td>100 BC – present</td>
</tr>
<tr>
<td>Planted forests</td>
<td>1800 – present</td>
</tr>
<tr>
<td>Planted, intensively-managed forests</td>
<td>1960 – present</td>
</tr>
<tr>
<td>Planted, superior trees, traditional breeding techniques</td>
<td>1970 – present</td>
</tr>
<tr>
<td>Planted, superior trees, clonal forestry, genetic modification</td>
<td>2000 - future</td>
</tr>
</tbody>
</table>
## Table 2: Estimated Global Harvests by Forest Management Condition, Circa 2000

<table>
<thead>
<tr>
<th>Forest Situation, Industrial Wood Harvest</th>
<th>Percent of Global Harvest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old-growth</td>
<td>22</td>
</tr>
<tr>
<td>Second-growth, minimal management</td>
<td>14</td>
</tr>
<tr>
<td>Indigenous second-growth, managed</td>
<td>30</td>
</tr>
<tr>
<td>Industrial plantations, indigenous</td>
<td>24</td>
</tr>
<tr>
<td>Industrial plantations, exotic</td>
<td>10</td>
</tr>
</tbody>
</table>
Table 3: Worldwide Timber Yields

<table>
<thead>
<tr>
<th>Site</th>
<th>Yield (m³/ha/yr)</th>
<th>Rotation (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperate and boreal softwood forests</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada average</td>
<td>1.0</td>
<td>-</td>
</tr>
<tr>
<td>British Columbia</td>
<td>1.5-5.3</td>
<td>-</td>
</tr>
<tr>
<td>Sweden average</td>
<td>3.3</td>
<td>-</td>
</tr>
<tr>
<td>Finland</td>
<td>2.5</td>
<td>60-100</td>
</tr>
<tr>
<td>Russia</td>
<td>1.0-2.9</td>
<td>-</td>
</tr>
<tr>
<td>Siberia</td>
<td>1.0-1.4</td>
<td>70-200</td>
</tr>
<tr>
<td><strong>Softwood Plantations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Britain (Sitka Spruce)</td>
<td>14</td>
<td>40</td>
</tr>
<tr>
<td>South Africa (Pine spp.)</td>
<td>10-25</td>
<td>20-35</td>
</tr>
<tr>
<td>New Zealand (Monterey Pine)</td>
<td>18-30</td>
<td>20-40</td>
</tr>
<tr>
<td>East Africa (Pine spp.)</td>
<td>25-45</td>
<td>20-30</td>
</tr>
<tr>
<td>Brazil (Pine spp.)</td>
<td>15-35</td>
<td>15-35</td>
</tr>
<tr>
<td>Chile (Monterey Pine)</td>
<td>20-30</td>
<td>15-35</td>
</tr>
</tbody>
</table>
Harvests Projected to rise about one-third over 50-year period and about one-half over a 150 year period. *Sohngen et al 2001*
Hypothetical Logging Costs: Alternative Site Conditions

Logging and Transportation Costs

- Old Growth Inaccessible
- Old Growth Difficult Terrain
- Old Growth Accessible Flat Terrain
- Second Growth: Unmanaged
- Second Growth: Managed
- Exotic High Yield Plantation

Site Conditions
Industrial Roundwood Production, 2001  (Countries producing greater than 15 million cubic meters)

This shape represents 100 million cubic meters. Areas shown are directly proportional to volume.

FAST-GROWING PLANTATIONS

- Million Hectares Hardwood -

Thailand 0.3
China 1.5
Vietnam 0.4
Malaysia 1.2
Indonesia 1.1
Australia 0.2
Chile 0.3
Argentina 0.4
Portugal 0.5
Spain 0.5
Brazil 2.9
Uruguay 0.2
South Africa 0.8

1/ Incl. 600 M ha of slow growing teak
2/ Mostly medium and slow growing

Source = Jaakko Pöyry
FAST-GROWING PLANTATIONS

- Million Hectares Softwood -

Vietnam 0.3
Indonesia 0.2
Australia 1.1
Portugal 0.6
Brazil 1.6
Argentina 0.5
New Zealand 1.5
Chile 1.5
South Africa 0.8

Source = Jaakko Pöyry
LAND AREA REQUIREMENTS
- Truly a Significant Contrast -

Fast-growing trees and short harvest times result in significantly less land area in the fast growing plantations regions required to support a world class pulp mill with today’s biological technologies
Tree Breeding and Biotechnology

- Traditional Tree Breeding has Yielded Substantial Productivity Increases
- The Potential of Hybrids
- Genetically Engineered Trees?
### Table 4: Gains from Various Traditional Breeding Approaches: Loblolly Pine

<table>
<thead>
<tr>
<th>Technique</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orchard mix, open pollination, first generation</td>
<td>8% increase in yields</td>
</tr>
<tr>
<td>Family Block, best mothers</td>
<td>11%</td>
</tr>
<tr>
<td>Mass pollination (control for both male and female)</td>
<td>21%</td>
</tr>
</tbody>
</table>

*Source: Westvaco Corporation*
Table 5: Biotechnology Tree Improvement Potentials

Important Attributes:

- Growth rates
- Disease and pest resistance
- Climate range and adaptability
- Tree form and wood fiber quality:
  - straightness of the trunk
  - absence of large or excessive branching
  - amount of taper in the trunk.
- Desired fiber characteristics may relate to ease in processing
  - e.g., the break-down of wood fibers in chemical processing.
<table>
<thead>
<tr>
<th>Innovation</th>
<th>Benefits</th>
<th>Additional Operating Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clone superior pine*</td>
<td>20% yield increase after 20 years</td>
<td>$40/acre or 15-20%</td>
</tr>
<tr>
<td>Wood density gene</td>
<td>Improved lumber strength</td>
<td>None</td>
</tr>
<tr>
<td>Herbicide tolerance gene in eucalyptus (Brazil)</td>
<td>Reduce herbicide and weeding costs, saving $350 or 45% per ha</td>
<td>None</td>
</tr>
<tr>
<td>Improve fiber characteristic</td>
<td>Reduce digester cost $10 per m$^3$</td>
<td>None</td>
</tr>
<tr>
<td>Reduced amount of juvenile wood</td>
<td>Increase value $15 per m$^3$ (more useable wood)</td>
<td>None</td>
</tr>
<tr>
<td>Reduce lignin</td>
<td>Reduce pulping costs $15 per m$^3$</td>
<td>None</td>
</tr>
</tbody>
</table>

*Source: Context Consulting. * non transgenic
Sobering Potential: Brazil

- Use Traditional Superior Tree
- Insert gene to increase pulp content
- Increases pulp content by 40%
- Use 6 year rotations
  But
- Brazil doesn’t allow transgenics
- Legal Changes??
Demand Considerations
Figure 2: World Industrial Roundwood Production

Source: FAO, Rome, selected years
**Table 6: Worldwide Annual Percent Growth in Consumption of Industrial Wood, 1950-2000**

<table>
<thead>
<tr>
<th>Period</th>
<th>Production/consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950 – 1960</td>
<td>3.54</td>
</tr>
<tr>
<td>1960 – 1970</td>
<td>2.20</td>
</tr>
<tr>
<td>1970 – 1980</td>
<td>1.10</td>
</tr>
<tr>
<td>1980 – 2000</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Figure 2: UN World Population Projections
(High, Medium & Low)

Stagnating Wood Demand

- Stabilizing and aging populations
- Wood Substitutes
  - Nonpaper packaging
  - Nonwood Construction
  - Newspaper substitutes, electronic

Not quite the “paperless” office, but ...
Summary of the World Situation: Supply expanding with stagnate demand

- More wood from less, but more intensively managed forest land.
- More low cost off shore competition.
- Potential future increased supplies from more plantations, biotechnical change, other innovations.
- Stagnant Global Market for raw wood: Will it continue?
### Table 7: Forests Today and Tomorrow: One View

<table>
<thead>
<tr>
<th></th>
<th>Circa 2000</th>
<th>Potential for 2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest area</td>
<td>3.2 billion ha</td>
<td>3.4</td>
</tr>
<tr>
<td>Industrial forests</td>
<td>0.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Croplands</td>
<td>1.5</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Source: Victor and Ausubel, *Foreign Affairs*, 2000
ISSUES: How should society manage these lands?

- INDUSTRIAL: How does the NA remain competitive in timber?
- ENVIRONMENTAL: For what ends do we manage the large areas of natural forest that increasingly will have low timber values?
  - For What Uses? Bioreserves? Dispersed housing?
  - What are the long-term implications for Canadian Forestry?
### Table 8: Industrial: Exchange Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>1 EU</th>
<th>US $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>1 EU</td>
<td>$ 1.15</td>
</tr>
<tr>
<td>2002</td>
<td>1 EU</td>
<td>$ 0.86</td>
</tr>
<tr>
<td>2003</td>
<td>1 EU</td>
<td>$ 1.17</td>
</tr>
</tbody>
</table>

Note: Lower $ provides cost advantage
US $ declined roughly 37% since 2002
Good news is that we are producing more agricultural and forestry products from less and less land. Overall eases pressures on the environment and opens options for other types of land uses including those devoted to the environment.
THE BALANCING ACT

- Although Boreal Forest Growth Conditions Are Far Outpaced by Fast-growing Plantation Regions --
  - There is more than one roadway to a balanced tomorrow
  - Significant growth rates have been achieved in Northern cottonwood plantations & new biotechnology is emerging for southern pine
  - The US South, PNW, US North & Canada can all show much improved growth with enhanced forest management
  - Are the economics there?
Forestry in Canada

- Low cost (often naturally regeneration) resource
- Much accessible terrain, but..
- Often well developed infrastructure, can make for low cost harvesting

- Almost sure to be a player in wood resource market.
But, to conclude, in Canada and elsewhere

- forestry will be competing with other foreign low cost producers
- other uses, e.g., reservation, recreation and dispersed development
- Opposition to tree cutting by some “greens”
- Will there be enough land provided for recreation, development and forestry?
- And, can producers make a sufficient profit?