Responses to Global Fuelwood and Fiber Insecurity

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Growing Danger to World’s Wood-Based Fuel and Fiber Security

- Global forest cover dropped 24.4% (by 0.94 B ha) in 1990-2000; 19% in previous 10 years; net forest cover dipping in all regions, except Europe (FAO 2003)

- Global forest area per capita now down to 0.60 ha (FAO 2003)


- Worldwide wood consumption up 64% since 1961; fuelwood & charcoal consumption up 80% in same period; more than 50% of world’s wood fiber supply burned for fuel (Matthews & Hammond 1999)

Production of fuelwood & industrial roundwood dropped in last 10 years: fuelwood (include. Charcoal) by 0.4%, from 1.86 B m³ in 1990 to 1.77 B m³ in 2000; per capita paper consumption in most developing countries remains low at around 15 kg/yr [< than 0.5% the 30-40 kg/yr considered minimu to meet basic needs for communication & literacy (FAO 2003, 1997; Matthews & Hammond 1999)
## Forests and Population

<table>
<thead>
<tr>
<th>Population (x100 million)</th>
<th>AF</th>
<th>EU</th>
<th>LAC</th>
<th>AP, WA</th>
<th>NA</th>
<th>PR</th>
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<td>&gt;8</td>
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</tbody>
</table>

AF: Africa  
EU: Europe  
LAC: Lat Am/Car  
AP: Asia-Pacific  
WP: West Asia  
NA: North Am  
PR: Polar Region

*Forest Degradation Trends*

1: Not applicable; 2: Improving quality/quantity; 3: Remaining relatively stable; 4: Continuing to deteriorate (from UNEP 1997)

Responses

- Human actions taken to alter and modify toward acceptable ends, the changed conditions and trends in ecosystem services and human well-being

- The diversity of actions intended to address drivers of ecosystem changes and human well-being

- E.g., plantations as response to worsening security in fuelwood and fiber
Expanding Forest Plantations

Table 1. Total forest cover and plantation forest areas by region of the world, 1990-2000.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total Cover 2000 (‘000 ha)</th>
<th>Plantation Forests 2000 (‘000 ha)</th>
<th>Total Cover 1990 (‘000 ha)</th>
<th>Plantation Forests 1990 (‘000 ha)</th>
<th>% Total Cover Change (1990-2000)</th>
<th>% Plantation of Total Cover (2000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>3 869 455</td>
<td>186 733</td>
<td>5 120 227</td>
<td>68 232*</td>
<td>-24.4</td>
<td>5</td>
</tr>
<tr>
<td>Africa</td>
<td>649 866</td>
<td>8 036</td>
<td>1 136 676</td>
<td>4 416</td>
<td>-42.8</td>
<td>4</td>
</tr>
<tr>
<td>Asia</td>
<td>547 793</td>
<td>115 847</td>
<td>657 361</td>
<td>56 051</td>
<td>-16.7</td>
<td>62</td>
</tr>
<tr>
<td>Europe</td>
<td>1 039 251</td>
<td>32 015</td>
<td>174 340</td>
<td>n.d.</td>
<td>496.1</td>
<td>17</td>
</tr>
<tr>
<td>North/Central America</td>
<td>549 304</td>
<td>17 533</td>
<td>958 312</td>
<td>501</td>
<td>-42.6</td>
<td>9</td>
</tr>
<tr>
<td>Oceania</td>
<td>197 623</td>
<td>2 848</td>
<td>200 971</td>
<td>n.d.</td>
<td>-1.66</td>
<td>2</td>
</tr>
<tr>
<td>So. America</td>
<td>885 618</td>
<td>10 455</td>
<td>1 050 695</td>
<td>7 264</td>
<td>-15.71</td>
<td>6</td>
</tr>
</tbody>
</table>

*Less Europe and Oceania
Source: FAO 2003, 1995

3 FAO 2000 assessment included more categories of cover in its definition of plantations than in previous assessments; thus, its 2000 plantation data cannot be directly compared to previous ones (see http://www.fao.org/docrep/003/y0900e/y0900e05.htm, p 12); but even if correcting for different data definitions by 50% of indicated cover in the 2000 assessment, plantation cover change indicated in Table 1 should still be positive, by about 60-65% in 10 years.
Uneven, but high. . .

- Plantations: 5% of world’s total forest cover in 2000
- Largest in Asia: 62%
- 60% of global total in only 4 countries: China, India, Russian Federation, US
- Plantation-sourced industrial wood today accounts for 25% of world supply

Source: FAO 2003; WRI 2003
It would seem that in the face of increasing threats to global wood-based fuel and fiber security, human responses have been more toward expanding tree plantings rather than on reducing fellings.

Global net cover loss will likely continue to occur until cover recovery from plantations exceeds cover losses from fellings.
Fellings and Substitution

Fellings may be reduced by substitution (FAO 2003). But substitution, even if it had intensified in recent years (Table 2), apparently has not been sufficient to reverse global pressures on forests, with losses in last 10 years climbing even higher by about 5.4 percentage points than in the previous 10.
Table 2. Global consumption of materials versus world population, 1971-1990.

(Ratios of per capita consumption in latter years of period to initial year; a value of 1.00 indicates that consumption is increasing at exactly the same rate as population; values larger or smaller than 1.00 indicate growth rates in raw materials that are greater or less than the rate of population growth respectively).

<table>
<thead>
<tr>
<th>Period</th>
<th>Cement</th>
<th>Steel</th>
<th>Aluminum</th>
<th>Wood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971-1980</td>
<td>1.21</td>
<td>1.05</td>
<td>1.21</td>
<td>0.98</td>
</tr>
<tr>
<td>1981-1990</td>
<td>1.11</td>
<td>0.93</td>
<td>1.13</td>
<td>1.03</td>
</tr>
<tr>
<td>1971-1990</td>
<td>1.33</td>
<td>0.95</td>
<td>1.29</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Source: Forest Products Management Development Institute, University of Minnesota (2003).
Policy Drivers of Plantations

- In theory, world’s current demand for industrial wood for fuel & fiber may be met from plantations covering an area of <10% of today’s natural forests[^4], if:
  - Legal protection for old-growth were strengthened
  - Forestry management standards were tightened
  - Financial incentives for plantations & good forest management were increased
  - Community plantations for fuelwood encouraged, until shifts to other alternatives

[^4]: 78% of industrial wood is from plantations in oceania; >40% in Africa and Asia (Matthews & Hammond 1999 c.f. Brown 1998)
Other Drivers

- Improved technology to:
  - Increase the efficiency of fuelwood and fiber utilization
  - Overcome limiting factors on plantation cropping: low yields, high juvenile mortality in tropical countries (as much as 70%), low planting successes, high production costs, high ecological toll from fast growing non-native species (Matthews & Hammond 1999 c.f. Hall 1997, FAO 1997, Boonstra et al. 1998)

- Supportive institutional arrangements: stronger tenure, more/closer sectoral partnerships (CIFOR 2003; Edmunds & Wollenberg 2002; Fortmann 2003; others)
Recommendations

- Stronger policy support for plantations
- Better technologies
- More effective institutional arrangements
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