Are we too concerned about wood production?

As forest managers we are often accused of being too concerned about wood production. We are told we should pay far more attention to non-wood aspects, especially such aspects as:

- the protection of fauna and flora;
- bio-diversity;
- soil protection (especially the prevention of degradation);
- the quantity and quality of water;
- recreation;
- the carbon cycle;
- climatic aspects, (micro and macro);
- indigenous people’s rights.

Taking both a global and a long-term view, I want to review the question of wood production.

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**Presidential address**

* by Dr Wink Sutton

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**WORLD WOOD PRODUCTION**

Over the last 40 years FAO statistics show that the world’s wood harvest has gone from less than 1.5 billion m³ in 1950 to nearly 3.5 billion m³ by 1989. This represents an annual increase of 2.3%. Consistently through this period almost equal quantities of fuel wood and industrial wood were consumed annually.

Over the same period the world’s population has gone from 2.53 billion in 1950 to over 5.18 billion in 1989. As this represents an annual growth increase of 1.8% it implies that the per capital consumption of wood is rising. It is. It has gone from less than 0.6 m³ per person per year in 1950 to 0.67 m³ per person per year in 1989.

The forecast is for demand to increase even further. Earlier this year FAO released projections of wood demand by major end uses to the year 2010 (FAO, 1991(a)). Values are given in Table 1. Also given in Table 1 are the UN’s medium projections of world population for the year 2010. In Figure 1 these pro-

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**TABLE 1**

PROJECTIONS OF WOOD DEMAND (in billion m³) AND POPULATION (in billions) TO 2010

<table>
<thead>
<tr>
<th></th>
<th>1989 PRODUCTION</th>
<th>2010 PROJECTED</th>
<th>INCREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Wood</td>
<td>1.68</td>
<td>2.68</td>
<td>1.00</td>
</tr>
<tr>
<td>Fuel Wood</td>
<td>1.78</td>
<td>2.39</td>
<td>0.61</td>
</tr>
<tr>
<td>All Wood</td>
<td>3.46</td>
<td>5.07</td>
<td>1.61</td>
</tr>
<tr>
<td>Population</td>
<td>5.1</td>
<td>7.2</td>
<td>2.1</td>
</tr>
</tbody>
</table>

SOURCE: FAO, 1991(a)

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**FIGURE 1**

TOTAL WORLD WOOD HARVEST AND WORLD POPULATION
(With Projections to 2010)

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*Presented to the combined meeting of the NZ Institute of Forestry and the Institute of Foresters of Australia (ANZIF) at Christchurch, on October 4, 1991.
jections to the year 2010 are given together with the annual world harvest of wood from 1950 (as published in the FAO yearbooks).

In the period 1989 to 2010 the annual wood harvest is predicted to increase by 1.61 billion m$. The world population is expected to increase by 2.1 billion over the same period.

At these levels of production and population the per capita consumption will have increased to over 0.7m$ per person per year by the year 2010.

An increase of 1.6 billion m$ over 21 years is a huge extra volume. It represents an annual increase of 77 million m$.

To achieve this increased production the world has, each year, to harvest the equivalent of another British Columbia or six current New Zealand harvests.

A review of the world’s forest resources shows that we are nearing the limits of forest exploitation. For those countries where production is based on virgin natural forest or managed natural forests there is little potential to increase harvest levels in the USA, USSR or Canada. Europe has some potential to increase harvest (e.g. Sweden and France) but the increase cannot be large (at most an extra 100 million m$ 3/yr by about 2010).

For the remaining natural forests in much of the rest of the world (Africa, Asia, Central and South America, Oceania) there are doubts that the present level of supply can be sustained, let alone increased. This is especially so for the supply of tropical hardwood sawlogs.

<table>
<thead>
<tr>
<th>TROPICAL REGIONS</th>
<th>VOLUME</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>Total</td>
<td>16</td>
</tr>
<tr>
<td>Brazil</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>23</td>
</tr>
<tr>
<td>Asia</td>
<td>Total</td>
<td>87</td>
</tr>
<tr>
<td>Malaysia</td>
<td>41</td>
<td>31</td>
</tr>
<tr>
<td>Indonesia</td>
<td>36</td>
<td>27</td>
</tr>
<tr>
<td>Others</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>134</td>
</tr>
</tbody>
</table>

**MAJOR WORLD GROUPINGS**

| Total tropical hardwoods | 134 | 13 |
| Other hardwoods          | 158 | 16 |
| Total hardwoods          | 292 | 29 |
| Total comifers           | 714 | 71 |
| All sawlogs              | 1,006| 100|

**SOURCE:** FAO, 1991(b)

**FIGURE 2**

1989 WORLD SAWLOG SUPPLY WITH NON-CONIFER VOLUME FROM THE TROPICS
(In Million m$^3$)

- Africa (134)
- Central & South America (19)
- Asia (41)
- Malaysia (36)
- Indonesia (36)
- Brazil (19)
- Others (10)

**TROPICAL HARDWOOD SAWLOGS – A CASE STUDY**

Concerns, especially by environmentalists, have raised awareness of the rate at which the tropical forest is being cleared. While authorities seem to agree that logging is neither a major nor a prime source of tropical forest destruction, the use of tropical harvest sawlogs is now being vigorously discouraged. The assumption is that the lower the sawlog demand the slower will be the loss of the tropical forest.

As tropical hardwood sawlogs are desirable products the success of such a worthy objective depends upon substitution by an alternative product(s). Before considering possible substitutes it is necessary to establish the volume of tropical sawlogs currently being used. The FAO production statistics for 1989 (FAO, 1991 (b)) show that the world’s total sawlog harvest was 1006 million m$. Of this 291 (or 29%) were hardwoods and of those just under half (134 million m$, or around 13% of the total sawlog harvest) came from tropical countries. (See Table 2 and Figure 2). The largest producers of tropical hardwood logs are Malaysia, Indonesia and Brazil, with respectively 41, 36 and 19 million m$^3$ harvested in 1989.

**PLANTATION AND SUBSTITUTION ALTERNATIVES**

The tropical hardwood sawlog harvest is large. It represents more than 10 times
the current total harvest of all New Zealand wood, or about 10 million m$^3$ more than the current total sawlog harvest of either Canada or all of Western Europe. To suddenly stop using such a volume would involve a major dislocation of the world economy. Disruption would be reduced if alternative supply sources of suitable quality wood could be identified. Another alternative would be to quickly switch to suitable wood substitutes. There is little possibility of the tropical sawlog deficit being made up from other remaining natural forests (either virgin or managed). There are few areas left in the tropics and all of those are under environmental pressure. Those outside the tropics are, or soon will be, under similar conservation and environmental pressures. They offer no prospect of increased supplies. At best, the areas outside the tropics can sustain production. It is more likely that production levels will decrease.

Plantations, especially those of fast-growing species, are proposed as an alternative source of supply. Indeed, within the tropical countries much is made of the plantation efforts as an alternative supply source to the tropical forest. However, to replace the tropical hardwood sawlogs, the plantations, even those of fast-growing species, must be intensively managed to produce large quality sawlogs. While few reliable figures are available it is doubtful (apart from the already established teak plantations) that any (but a token of effort) of the plantations now being established will be managed for the production of quality sawlogs. Almost all plantation efforts in the tropics are aimed primarily at short rotation pulpwood crops. In no way can the plantation effort within the tropics be regarded as an alternative source of quality tropical hardwood (and that is without taking into account the time required to grow large trees).

Estimates of plantation area are not readily available. My own work suggests that there are around 100 million hectares of plantations in the world. Of these, nearly 14 million are fast growing (defined as having a mean annual increment of 14m$^3$/hectare/year). The distribution of those plantations by region, by hardwood/softwood, and by management intention is given in Table 3 and Figure 3. The area of pruning has been included as pruning is probably the only means of achieving a high-quality sawlog which in any way equates to the quality of the current harvest of tropical hardwood sawlogs. (Although a maximum of 2 million hectares has been pruned only about half these stands have been specifically managed for clearwood production.)

To put the tropical hardwood in perspective, we can calculate the area of pruned radiata needed to replace it. The volume of pruned radiata sawlogs represents about a third of the radiata crop. As radiata averages around 20m$^3$/hectare/year then pruned log growth represents about 7m$^3$/hectare/year. To achieve an annual yield of 134 million m$^3$ we would need the sustained yield from a plantation of about 19 million hectares (134 ÷ 7). That represents an area 18 times the current area of radiata pruned around the world (most of which is in New Zealand). It also represents an area 75% of the total land area of New Zealand. In other words we need a managed plantation, equivalent in area to the total area of all the land in New Zealand capable of sustaining forest growth, just to sustain a harvest of quality logs of a

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**TABLE 3**

<table>
<thead>
<tr>
<th>REGION</th>
<th>CONIFERS</th>
<th>HARDWOODS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PULP**</td>
<td>SAWLOGS</td>
</tr>
<tr>
<td>Africa</td>
<td>0.4</td>
<td>0.6(0.5)</td>
</tr>
<tr>
<td>Asia</td>
<td>0.4</td>
<td>-</td>
</tr>
<tr>
<td>Cen &amp; Sth</td>
<td>2.0</td>
<td>1.9(0.3)</td>
</tr>
<tr>
<td>Europe</td>
<td>0.05</td>
<td>0.2</td>
</tr>
<tr>
<td>Oceania</td>
<td>0.2</td>
<td>1.9(1.2)</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>3.05</strong></td>
<td><strong>4.6(2.0)</strong></td>
</tr>
</tbody>
</table>

*Fast growing is defined as having mean annual increment greater than 14m$^3$/ha/yr.
**Pulp includes all non-sawlog objectives (other than fuel).

Volumes in brackets are estimates of areas pruned.

**FIGURE 3**

**FAST GROWING PLANTATIONS - 1990**

(In million hectares)

- CONIFERS 7.65
- HARDWOODS 5.95

of which

- CONIFERS 7.65
- HARDWOODS 5.95

managed for

- PULP 3.05
- SAWLOGS 4.6
- SAWLOG PRUNED 2.0

(Continued on page 30)