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Long-Run Demand for Wood - Trends in World Population and Wood Use

It is useful, every so often, to examine and document critical underlying assumptions. This is especially true for assumptions that are based on information that is not updated frequently. Here we look at trends in world population and the impact of those trends on timber demand.

KEY ASSUMPTIONS

Timberland appraisal makes up a large portion of the work we do in the natural resources group at Sewall. While our appraisal work is generally concentrated in the eastern United States, we have also appraised timberland in Canada, Australia and Brazil and reviewed appraisals from a number of other countries. One of the fundamental assumptions held by the market is that demand for wood will generally increase faster the supply of wood in the future, thus providing upward pressure on timber prices over time. Our appraisals usually contain the following paragraph:

“There is broad consensus that the demand for roundwood will continue to increase globally. Increasing population and improving standards of living in both developing and developed countries are expected to drive the growth of demand for wood for both solid wood and pulp products.”

A fundamental assumption is that world population will increase over time. Is this true?

POPULATION TRENDS

The short answer is that our assumption is correct and that world population is expected to increase through 2050, and the trend up to that time suggests further increases after that. (2050 sounds like it is a long time in the future, but most seedlings planted in the US Pacific Northwest next summer will barely be ready for harvest at that time.)

We found three sources of population projections. The United Nations Population Division provides official UN projections. Their most recent projections were developed in 2000 and extend through 2050. The US Bureau of the Census provides its own projections of world population, the most recent in 2000. The Population Reference Bureau produces a third set of projections. Its most recent forecast was in 2002.

The UN Population Division produced four forecasts: a forecast based on recent historical growth which brought world population to 13 billion by 2050; a high growth rate (11 billion by 2050); a medium growth rate (over 9 billion by 2050) and a low rate, which calls for population to level off by about 2040, and perhaps decline after that. We use the medium growth rate in our analysis.

Figure 1 shows the most recent world population forecast from each source.

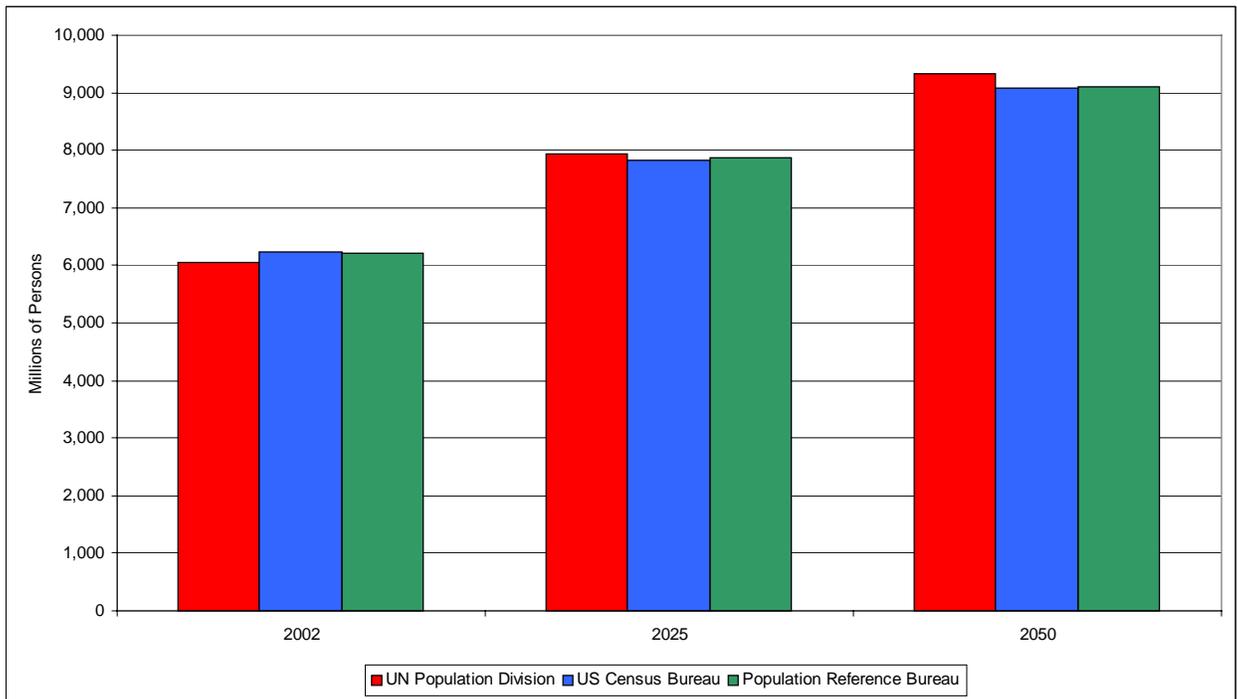


Figure 1. Comparison of World Population Forecasts

There are no major differences between the forecasts. The US Bureau of the Census projected just under 9.1 billion people in 2050, while the UN Population Division projected just over 9.3 billion people. For all practical purposes, the numbers are the same.

WOOD CONSUMPTION

So the world is going to have more people under the most likely scenario. The second key assumption in our appraisal report paragraph is that people will keep using more wood.

Figure 2 shows historical and projected world population numbers from the Census Bureau and world roundwood production numbers from the UN FAO. The UN FAO defines roundwood as “wood in the rough”, a measure of harvest volumes or total wood production. The chart shows two roundwood numbers: total and industrial. Industrial roundwood is wood destined for further processing into lumber, panels or pulp and paper. The remaining (non-industrial) roundwood is almost all burned for cooking and heating. Figure 2 suggests that almost half of the wood produced in the world for the past 40 years has been burned.

Note that roundwood production is being used here as a proxy for wood consumption. They are not exactly the same thing. Roundwood will deteriorate relatively quickly (compared to live standing timber), so production must be tied closely to consumption by processing facilities. However, there can be significant short-term differences between the production of lumber and paper and the consumption of those products. So the use of roundwood production is not a perfect measure of wood consumption.

In an apparent contradiction of our assumption, world production of industrial roundwood flattened in 1990—world population has increased since then, but wood consumption has not. There are four factors that may help account for this discrepancy.

First, timber prices shot up sharply in the early 1990s as National Forests in the US PNW were shut down. This encouraged the substitution of other materials for wood. For example, steel studs made significant gains in residential construction as spot prices for 2x4s rose from under \$200/MBF in late 1992 to almost \$500/MBF in early 1993.

Second, production collapsed in the former USSR countries in the early 1990s. According to the UN FAO, industrial roundwood production averaged 290 million cubic meters (mmcm) per year from 1982 to 1991 and only 130 mmcm per year from 1992 to 2001. Market and political turmoil in these countries as they shifted from planned to market economies reduced demand and production and financial infrastructure.

Third, the collapse of Southeast Asian economies in the late 1990s reduced demand for wood in that region and prevented producers in the region from operating their mills at full capacity.

Fourth, improved technology and an increase in the use of recycled fibers has allowed an increase in production of lumber and pulp and paper without an corresponding increase in the use of roundwood.

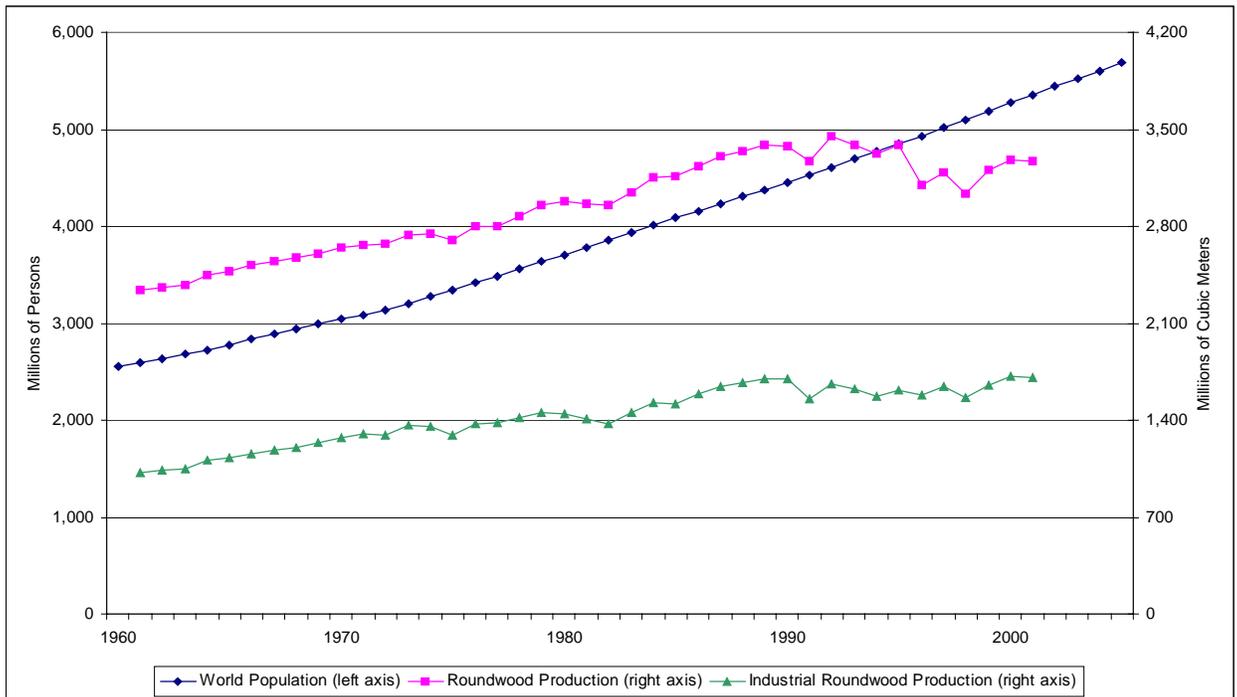


Figure 2. World Population and Roundwood Production

PER CAPITA WOOD CONSUMPTION

Figure 3 divides the production numbers in Figure 2 by the population numbers. Once again we are using roundwood production as a proxy for wood consumption. This chart indicates per capita consumption of industrial roundwood has been more or less stable from 1970 to 1990, at about 0.4 cubic meters per person. (For those of us who are metrically challenged, this is 14 cubic feet, or a block of wood that is about 2.4 feet on each side.) Continued growth in world population along with a slow-down in the global economy (and increased recycling?) caused average consumption of industrial roundwood to drop to just over 0.3 cubic meters (10.5 cubic feet) per person by the late 1990s.

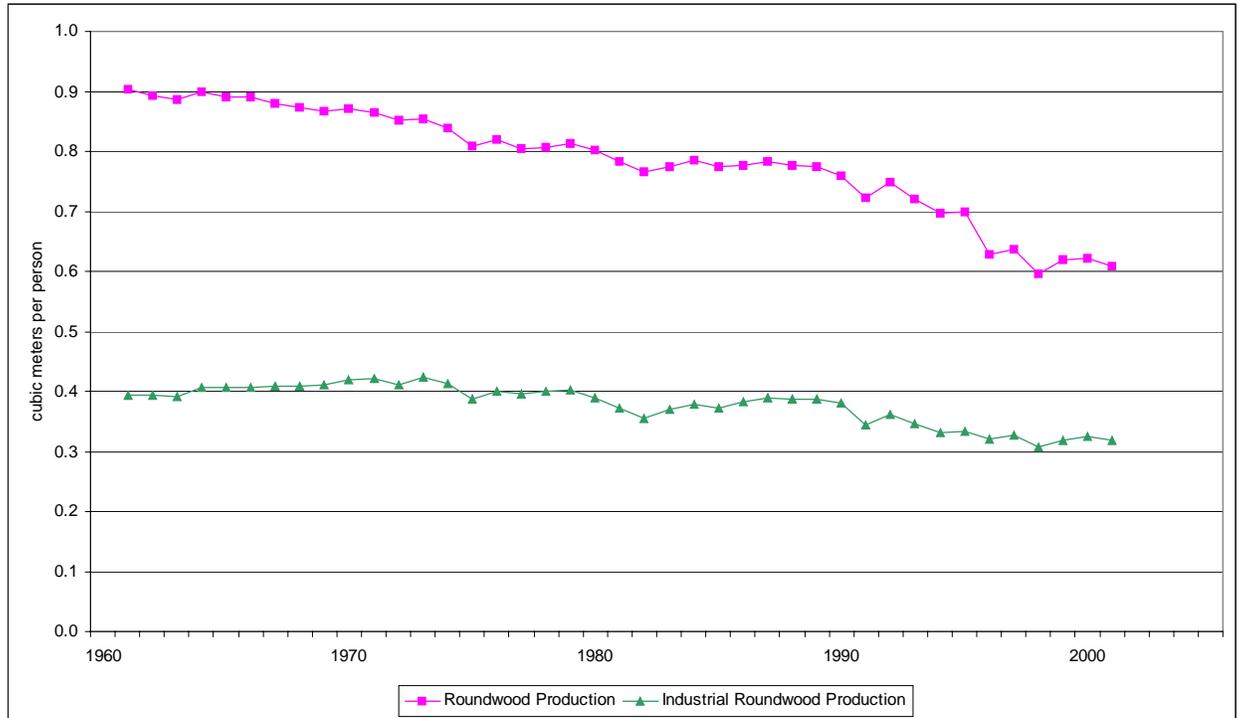


Figure 3. Per Capita Roundwood Production

ANALYSIS LIMITATION

This analysis compared total world population with total wood production. We don't look at supply at all. We might find industrial wood consumption in industrialized countries significantly outpaces industrial wood consumption in developing countries. However, roundwood *production* numbers are less useful when looking at individual countries because they do not provide a clear picture of wood flows. For example, a developing country could produce significant volumes of industrial roundwood that is all exported. In this case, production would *not* be a good indicator of consumption for that country.

The UN FAO *does* provide data on lumber, panel and pulp & paper production, and import and export estimates for these products and roundwood, which would allow a more detailed analysis of global wood flows. Perhaps in a future issue...

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