What will we want from the forests?

Estimating the current and future demand for forest products and services

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CURRENT WORLD demand for the products and services of forests is a mix of static or only slightly increasing demand for wood, a steady but slowly increasing demand for non-timber forest products (NTFPs), and a burgeoning but largely unmonetised demand for environmental services.

Any estimate of future demand cannot safely be based on current and recent past demand. A large number of developments inside and outside the forest sector have to be incorporated and combined to produce a 'realistic' outlook. The estimate of future demand presented in this article does that and indicates, among other things, that the global economic importance of forests will increasingly lie in their non-timber products and especially in their environmental functions.

'Forests are more than wood factories' could become a slogan of the future. Wood in that future will increasingly be a by-product of sustainable management for forest conservation.

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Current demand

The estimate of the current demand for forest products and services presented here is based on the following premises:

1) the Food and Agriculture Organization of the United Nations (FAO) series of global forest products' statistics is the main data source for timber products;
2) industrial roundwood (IRW) plus fuelwood constitute timber products' demand (all other significant timber products are derived from IRW);
3) production is an adequate proxy for current demand for timber products at the world level;
4) demand, wherever the data allow, is measured in volume terms as a better indicator of the effect on the forest resource than demand measured in monetary terms;
5) demand for value-added timber products and NTFPs is measured in value terms because of the inability to aggregate the various physical units involved. For value-added timber products, the lack of global production values necessitates the use of export values as a proxy, meaning that total production/demand for these products is likely to be significantly higher than indicated here;
6) quantities are expressed as the mean of data available for the most recent two successive years in order to reduce the effects of unknown annual changes in stocks and governing economic conditions; and
7) demand for the very diverse range of environmental services is, at present, only partially quantifiable either in physical or value terms and is therefore based on recent estimates of the economic value of such services. Actual financial transactions involving such services are currently a tiny fraction of the estimated value of demand.

On that basis, the current demand for forest products and services is estimated to be at the levels summarised in *Table 1*.

Three features of current demand are brought out by these estimates. They are that:

- at a little over 1 m³/hectare/year, demand for timber and wood products presents no great threat to the sustainability of the world's forests;

Current demand

Table 1: Current (2003) world demand for the products and services of forests

CATEGORY	SUB-CATEGORY	BY VOLUME *billion m³ roundwood*		BY VALUE *billion US$*		SOURCE	APPROXIMATE LEVEL OF CONFIDENCE IN ESTIMATE
Timber products	**TOTAL**	**3.5**		**150***		*FAO (2004)*	70%
	IRW		1.6				
	Fuelwood		1.9				
Value-added products, world trade	**TOTAL**			**33**		*ITTO (2004 & 2005)*	80%
	Furniture				27		
	Doors/joinery/other				6		
NTFPs, world trade	**TOTAL**			**9**		*Scherr et al. (2004; Table 8)*	40%
Environmental services**	**TOTAL**			**900**		*Scherr et al. (2004; Table 8)*	5%
	Watersheds				30		
	Recreation				90		
	Biodiversity***				200		
	Climate				450		
	Miscellaneous				130		

*Value of world trade of all primary timber products (thus a lower limit in value of demand)
**Estimated as value/hectare/year multiplied by the 3 billion hectares of forest estimated to exist globally in 2000
***Calculated from total minus other sub-categories

- the global importance of forests apparently derives from the environmental services they provide, not from their so-called productive functions; and
- the essentially social valuation of environmental services is not reflected in the financial calculations which control the monetary accounts and flows relating to forest utilisation and management. In other words, despite the high apparent value of environmental services they are not being paid for and therefore have little impact on forest-related cash flows.

Future demand

Current demand does no more than set a baseline. It tells us nothing about the much more relevant and crucial question for the formulation of forest policy, conservation policy and management, which is how demand is likely to develop in the future. The required demand forecasting can be approached in any or all of three ways:

1) by the projection of trends detected in demand data covering the recent past;
2) by derivation from estimated or given future levels of demand determinants such as population and income growth; and
3) by derivation from a broader scenario of the future pieced together not only from trends and the demand determinants but also including clues about supply, alternative materials, consumer tastes and socioeconomic development.

By trend projection

Estimating the future level of demand by trend projection depends heavily on the period covered by the recent past. *Table 2* illustrates the effect on future demand for IRW. The method is of limited validity other than to 'justify' almost any pre-determined desired level of future demand.

By demand determinants

In a working paper prepared by FAO in 1999, demand for industrial roundwood in 2010 based on expected future economic and population growth was estimated to be 1.8 billion m^3. The implied average annual rate of growth in demand of 1.2% per year is well above anything recorded over the recent past. The likelihood of such a reversal of or impetus to recent trends is not high. The estimate of the future level of demand can, of course, be varied by applying other rates of change to the demand determinants. But that leaves the method open to the same indictment of manipulation that applies to trend projection.

By scenario-building

Both trend projection and demand determinants are conditional on nothing else changing in the future other than the factors specifically allowed for in the calculations. But this would be fiction: many clues that portend a vastly different future for forests are already visible. Within the sector, for example, the world's existing plantation resource has the potential capacity to meet a demand for industrial roundwood approaching 2 billion m^3 per year. Technological advances are enhancing the in-use performance, reliability and uniformity of timber products to help regain markets lost to non-renewable substitutes—although such substitution will continue for some time to act as a check on overall timber demand. Improved efficiency of production and utilisation of by-products means that the production of finished products can increase without increasing demand for industrial roundwood. Demand for fuelwood as a feedstock for bio-energy could reverse the declining trend in fuelwood demand that accompanies economic and social development.

Outside the sector, changes associated with economic globalisation, trade liberalisation, global warming, declining oil reserves, rising demand for hydrological services and reforms in governance systems will have vast impacts on what happens to and within the sector.

Predicting future demand by past trends

Table 2: Future world demand for industrial roundwood by trend projection

RECENT PAST	TREND	AVERAGE ANNUAL RATE OF CHANGE	DEMAND IN YEAR *(billion m^3 roundwood)*		
			2010	2020	2030
1992–2002	Stagnant	0	1.6	1.6	1.6
1987–2002	Declining	-0.06%	1.5	1.4	1.3
1982–2002	Rising	+0.06%	1.6	1.7	1.8

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Scenario-building is a deliberate attempt to incorporate such changes into the demand outlook. But it is still a conditional method, the condition being that the changes occur and act in the way assumed in the scenario. However, it at least recognises the high probability of situational change rather than just ignoring it. Another crucial feature is that the dimensions and structure of the scenario have to be built up more by subjective judgement than by econometric calculation. Finally, there are few data on recent trends or demand determinants for value-added products, NTFPs or forest environmental services, leaving no choice but to use scenario analysis to make projections.

From this background, a plausible scenario from which to derive future demand would include, among other things, the following key components:

- almost static demand for IRW (impact of growing populations offset by increased processing efficiency and substitution by competing products);
- initially declining demand for fuelwood with the decline halting and then slowly reversing several decades hence;

Predicting future demand by scenario-building

Table 3: Estimated future demand for the products and services of forests to the year 2040 based on scenario-building

CATEGORY	UNIT	DEMAND IN YEAR			
		2010	2020	2030	2040
IRW total	$m^3 \times 10^9$	1.6	1.7	1.7	1.8
Saw & veneer logs		0.9	0.9	0.8	0.8
Pulpwood		0.5	0.6	0.7	0.8
Other		0.2	0.2	0.2	0.2
Fuelwood total	$m^3 \times 10^9$	1.9	1.7	1.8	1.9
Domestic & commercial		1.9	1.5	1.5	1.4
Industrial bio-energy		0	0.2	0.3	0.5
Value-added products	$US x 10^9	40	60	100	140
NTFPs	$US x 10^9	10	15	20	35
Environmental services					
Total	$US x 10^9	1050	1420	1960	2600
Watersheds		50	80	140	200
Recreation		100	110	120	140
Biodiversity		250	350	500	700
Climatic		500	700	1000	1300
Miscellaneous		150	180	200	220

- a continuing increase in processing efficiency, especially for paper and value-added products;
- plantations becoming a main global source of timber and wood products in 10–20 years;
- an accelerating rate of transfer of trade from primary processed timber products to value-added products;
- rapid acceleration and widening of the demand for environmental services and gradual extension of quantitative valuation of them (eg the 'ecosystem marketplace' initiative of the Katoomba Group);
- intensified price competition in export markets as plantation sources tend towards over-supply of commodity-grade timbers; and
- decreasing availability of natural forests for timber production.

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The accumulation of that partial set of scenario components results in the demand outlook presented in *Table 3*.

It must be stressed that this outlook is largely subjective and completely dependent on the set of assumptions listed above. Nevertheless, it does provide an informed judgement of how demand could and is likely to evolve over the first decades of this century. It also illustrates the huge challenge in converting the enormous demand potential and social valuation of forest environmental services into an effective demand based on adequate financial flows to pay for providing those services.

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This article is based on material prepared for ITTO as a contribution to a background paper for the Country-led Initiative in Support of the United Nations Forum on Forests on the Future of the International Arrangement on Forests, which was convened in Guadalajara, Mexico, on 25–28 January 2005.