

## Criterion 6, Indicator 32—Value of Wood and Non-Wood Products Production as Percentage of GDP

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The purpose of this report is to provide information on the rationale and data provided for Indicator 32 for the U.S. *National Report on Sustainable Forests—2003*. Information on the rationale for the Indicator and recommended data to be developed are taken from the report of the Technical Advisory Committee of the Montreal Process<sup>1</sup> and from reports from the technical workshops of the U.S. Roundtable on Sustainable Forests Criteria and Indicators. Data that have been developed are displayed and sources are provided. The data are summarized in the *National Report on Sustainable Forests—2003*.<sup>2</sup>

### A. Rationale for use of the Indicator

#### 1. Rationale from the Technical Advisory Committee (TAC)

This indicator is one measure of the contribution and importance of the forest sector to the national economy.

**Approaches to measurement**—Data outlined in Indicators 29 and 30 apply to Indicator 32. These should be expressed as a percentage of national gross domestic product (GDP). As outlined for Indicator 30, each nation will determine its own list of ‘non-wood’ products. Indicator 32 can be measured by comparing current data for wood and non-wood products with data for national GDP. Trends can be established by using historic data.

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<sup>1</sup> See [http://www.mpci.org/tac/mexico/tn1-6\\_e.html](http://www.mpci.org/tac/mexico/tn1-6_e.html)

<sup>2</sup> See <http://www.fs.fed.us/research/sustain/>

## **2. Interpretation of the indicator as proposed by the TAC**

Increasing value of wood and non-wood products as a percentage of GDP often indicates growth in the contribution of these products to the national economy. Value of wood products may fluctuate due to changes in general economic conditions, availability of supply, or societal preferences. A trend in the value of non-wood products over time may be a partial indicator of diversification in use of forests and diversity of local economies. Reductions in this measure may reflect substitution of non-wood materials for wood products.

Issues raised under interpretation of Indicator 29 also apply here.

## **3. U.S. Clarification from the Roundtable Workshops**

The group felt that it was possible to describe the market contribution of only some non-timber forest products (NTFPs). Estimating the value associated with NTFPs is difficult. Household effects should be considered.

This indicator does not necessarily capture changes in individual products or market segments, which could be significant (e.g., engineered wood products).

This indicator says nothing about the Forest Products Sector. It does not have a straightforward interpretation. If the forest products sector were declining, the indicator implies that the relative importance of wood and non-wood products in the economy is declining. Either an upward or downward trend is consistent with several interpretations.

## **B. Data provided to quantify the Indicator**

### **1. Definitions of GDP and industry contribution to GDP**

Gross domestic product (GDP), the featured measure of U.S. output, is defined by the USDOC Bureau of Economic Analysis as the market value of the goods and services produced by labor and property located in the United States.<sup>3</sup>

Gross product, or gross product originating (GPO), by an industry is the contribution of each private industry to the Nation's output (GDP). An industry's GPO, often referred to as its "value added," is equal to its gross output (sales or receipts and other operating income, commodity taxes, and inventory change) minus its intermediate inputs (consumption of goods and services purchased from other industries or imported).<sup>4</sup>

### **2. Wood products**

From the interpretation of this indicator provided by the TAC, it is not clear if the committee intended a comparison of product values to GDP or the more conventional comparison of value

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<sup>3</sup> See page M-5 in USDOC. *A Guide to the NIPA's* <http://www.bea.gov/beat/nipaguid.pdf> under <http://www.bea.gov/beat/nipaguid.htm> accessed May 12, 2003.

<sup>4</sup> See Yuskavage (1998), p. 18.  
<http://www.bea.gov/beat/ARTICLES/NATIONAL/Inputout/1998/0398gpo.pdf>

added by an industry to GDP. We provide information on both value added and value of products compared to GDP.

The contribution of the forestry sector to gross domestic product is defined as the value added by businesses that contribute to making wood and paper products. We define the forestry sector to include forestry services (SIC 08), lumber and wood products (SIC 24), paper and allied products (SIC 26), and, to the extent that data are available, wood furniture (parts of SIC 25).

Forestry services (SIC 08) include firms that may produce some non-wood forest products as well as provide management services. These firms may be primarily engaged in managing timber tracts, tree farms, forest nurseries, reforestation services, and gathering of gums, barks, balsam needles, maple sap, Spanish moss, ginseng, and huckleberry greens.

Value added by an industry includes value the industry adds to raw materials and other inputs. For forest products firms that own forest land, value added would include the value these firms add by applying forest management activities on land to produce roundwood for products or for sale. But to the extent that forest land is owned by firms outside the forest products industry, value added by forest management is not included in the value added by wood, paper, and furniture firms. Value added for these industries also includes value added in making any products other than wood and paper products

Data are provided on the value added by primary wood and paper products industries and wood furniture industries, the percentage of all GDP, and the percentage of value added by all manufacturing industries (Table 32-1).

Data available for non-wood forest products are usually for the value of products rather than value added. In order to compare the size of wood, paper, and furniture industries in the economy to the size of non-wood forest products industries, we show the value of shipments, which may be loosely compared to the value of non-wood forest products Table 32-2). The value of shipments includes the value added by other industries that provide inputs to making wood, paper, and wood furniture.

### **3. Non-wood products**

Non-wood forest products fall into several categories whose values are discussed under Indicator 30. These include (1) medicinals, (2) food and forage specie, (3) floral and horticultural species, (4) resins and oils, (5) arts and crafts, and (6) game animals and fur-bearing animals.

The only nationwide estimates of value available are for medicinals—in excess of \$4 billion (Table 32-3). Partial estimates for food and forage species, for floral and horticultural species, and for hunting and trapping indicate values that may be several hundred million dollars (Tables 32-4 and 32-5).

A conservative estimate of the value of non-wood products is \$5 billion or more based on values suggested above and in Indicator 30. This would be 0.05% or more compared to GDP. The value added contribution by non-wood products industries to GDP would be a portion of this percentage.

### **C. Interpretation of data relative to rational from TAC**

The data provided—value added and value of products compared to GDP—meet the intent of the rationale by providing “one measure of the contribution and importance of the forest sector to the national economy.” Data also show the contribution of the forest products sector compared to that of all manufacturing industries.

### **D. Limitations of data**

Data on value added by forest products industries include value added in making some non-wood fiber products. Data on value added include some, but not all, the value added by forest management activities.

Data on value of non-wood forest products are limited to a portion of the product categories; the portion that is value added is not available.

### **E. Options available for remedy if current data are not adequate to measure the indicator**

To define the contribution of non-wood forest products to GDP in terms of value added, the value of and employment in each industry must first be defined. Estimates of value added can be made by estimating average wage rates, production costs, etc. for each industry. Some industries are scattered throughout the United States (such as medicinals); others are very regionally based (such as florals and some wild foods). Industry size and contribution to the economy would best be estimated by segment and by region, much as has been done in forest products industries.

### **F. F. Cross-cutting issues/relationships with other indicators**

Data from this indicator are being constructed to be consistent with indicators on production (29) and consumption (30) and (31), by using consistent data sources and data categories to allow comparisons.

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**Table 32-1. Measure 1: Value added contribution of lumber, wood products, paper and allied products sector to U.S. GDP, 1947–1987, in million current dollars**

	Total GDP	Manufacturing GDP <sup>a</sup>	Forestry SIC 08	Lumber and wood products SIC 24	Paper and allied products SIC 26	Wood furniture SIC 25	Lumber and wood products (% GDP)	Paper and allied products (% GDP)	Wood furniture SIC 25 (part) (% total GDP)	SIC 24 + 26 (% total GDP)	SIC 08, 24, 26, + part of 25 (%total GDP)	SIC 24 + 26 (%manufacturing GDP)
1947	244442	65814		2632	2510		1.1%	1.0%		2.1%		7.8%
1948	269573	74823		3047	2641		1.1%	1.0%		2.1%		7.6%
1949	267651	72337		2634	2468		1.0%	0.9%		1.9%		7.1%
1950	294292	84152		3295	3079		1.1%	1.0%		2.2%		7.6%
1951	339511	99163		3713	3865		1.1%	1.1%		2.2%		7.6%
1952	358625	103452		3511	3605		1.0%	1.0%		2.0%		6.9%
1953	379912	112523		3469	3836		0.9%	1.0%		1.9%		6.5%
1954	381089	106914		3324	3956		0.9%	1.0%		1.9%		6.8%
1955	415209	121430		3905	4453		0.9%	1.1%		2.0%		6.9%
1956	437952	127502		3969	5035		0.9%	1.1%		2.1%		7.1%
1957	461490	132097		3564	4884		0.8%	1.1%		1.8%		6.4%
1958	467941	124625		3528	4871		0.8%	1.0%		1.8%		6.7%
1959	507448	140324		4184	5450		0.8%	1.1%		1.9%		6.9%
1960	527380	142538		3930	5546		0.7%	1.1%		1.8%		6.6%
1961	545661	143002		3789	5802		0.7%	1.1%		1.8%		6.7%
1962	586528	156796		4091	6136		0.7%	1.0%		1.7%		6.5%
1963	618681	166226		4523	6361		0.7%	1.0%		1.8%		6.5%
1964	664383	178114		4946	6789		0.7%	1.0%		1.8%		6.6%
1965	720108	196567		5460	7240		0.8%	1.0%		1.8%		6.5%
1966	789292	215773		5500	8048		0.7%	1.0%		1.7%		6.3%
1967	834073	221311		5655	8206		0.7%	1.0%		1.7%		6.3%
1968	911451	241752		6572	8914		0.7%	1.0%		1.7%		6.4%
1969	985331	254642		7357	9687		0.7%	1.0%		1.7%		6.7%
1970	1039674	249789		7044	9719		0.7%	0.9%		1.6%		6.7%
1971	1128571	263190		7834	9912		0.7%	0.9%		1.6%		6.7%
1972	1240409	290499		9474	11146	2338	0.8%	0.9%	0.2%	1.7%		7.1%
1973	1385527	321927		11480	12742	2536	0.8%	0.9%	0.2%	1.7%	2.0%	7.5%
1974	1501010	337128		11484	14011	2663	0.8%	0.9%	0.2%	1.7%	2.0%	7.6%
1975	1635165	354770		10466	13852	2341	0.6%	0.8%	0.1%	1.5%	2.0%	6.9%
1976	1823917	405834		13300	16508	2896	0.7%	0.9%	0.2%	1.6%	2.0%	7.3%
1977	2031387	462751	2890	16206	17917	3388	0.8%	0.9%	0.2%	1.7%	2.0%	7.4%
1978	2295897	517534	3211	19566	19597	3906	0.9%	0.9%	0.2%	1.7%	2.0%	7.6%
1979	2566398	571038	3532	21623	21866	4116	0.8%	0.9%	0.2%	1.7%	2.0%	7.6%
1980	2795561	587481	3912	19222	22817	4264	0.7%	0.8%	0.2%	1.5%	1.8%	7.2%
1981	3131342	652217	3780	17605	24901	4594	0.6%	0.8%	0.1%	1.4%	1.6%	6.5%
1982	3259224	650748	3856	16676	26470	4543	0.5%	0.8%	0.1%	1.3%	1.6%	6.6%
1983	3534934	693310	4079	21344	27516	5057	0.6%	0.8%	0.1%	1.4%	1.6%	7.0%
1984	3932722	782519	4201	24033	31238	5864	0.6%	0.8%	0.1%	1.4%	1.7%	7.1%
1985	4213016	804377	3976	24357	32464	5973	0.6%	0.8%	0.1%	1.3%	1.6%	7.1%
1986	4452851	829494	3832	27192	34575	6256	0.6%	0.8%	0.1%	1.4%	1.6%	7.4%
1987	4742462	888592	4339	32096	37753	7306	0.7%	0.8%	0.2%	1.5%	1.7%	7.9%
1988	5108325	979902	4710	32973	43750	7422	0.6%	0.9%	0.1%	1.5%	1.7%	7.8%
1989	5489061	1017673	4922	33762	45498	7347	0.6%	0.8%	0.1%	1.4%	1.7%	7.8%
1990	5803246	1040589	5062	32175	45027	7421	0.6%	0.8%	0.1%	1.3%	1.5%	7.4%
1991	5986208	1043541	4790	30338	44649	6801	0.5%	0.7%	0.1%	1.3%	1.4%	7.2%
1992	6318934	1081998	5877	32284	45604	7746	0.5%	0.7%	0.1%	1.2%	1.4%	7.2%
1993	6642328	1131403	6782	35714	46934	7746	0.5%	0.7%	0.1%	1.2%	1.5%	7.3%
1994	7054315	1223210	6999	39806	50104	8929	0.6%	0.7%	0.1%	1.3%	1.5%	7.4%
1995	7400534	1289069	6989	42316	58939	8861	0.6%	0.8%	0.1%	1.4%	1.6%	7.9%
1996	7813170	1316049	6542	39922	55890	8969	0.5%	0.7%	0.1%	1.2%	1.4%	7.3%
1997	8318376	1379609	5786	41176	53832		0.5%	0.6%		1.1%		6.9%
1998	8781527	1431499	5690	41896	55724		0.5%	0.6%		1.1%		6.8%
1999	9268604	1496784	6207	46273	57970		0.5%	0.6%		1.1%		7.0%
2000	9872938	1566579	5316	44443	59911		0.5%	0.6%		1.1%		6.7%

<sup>a</sup> Manufacturing contribution to GDP does not include GDP contribution from Forestry Services, SIC 08.

Sources: SIC 24 and 26, 1977–2000, USDC BEA (2002a, b); SIC 25, 1977–1992, USDC BOC (1995a,b); SIC 25, 1993–1996, USDC BOC (1998).

**Table 32-2. Measure 2: Value of shipments of lumber, wood products, paper and allied products, and wood furniture sector compared to U.S. GDP, 1977–2000, in million current dollars**

Year	Total GDP	Lumber and wood products			Paper and allied products		SIC 08 (% GDP)	SIC 24 (% GDP)	SIC 25 (part) (% GDP)	SIC 26 (% GDP)	SIC 24 + 26 (% GDP)	SIC 08, 24, 25 (part), + 26 (% GDP)
		Forestry SIC 08	SIC 24	SIC 25	SIC 26	SIC 26						
1977	2031387	2890	39943	9094	52086	0.1%	2.0%	0.4%	2.6%	4.5%	5.1%	
1978	2295897	3211	46521	10672	57001	0.1%	2.0%	0.5%	2.5%	4.5%	5.1%	
1979	2566398	3532	49854	11164	65201	0.1%	1.9%	0.4%	2.5%	4.5%	5.1%	
1980	2795561	3912	47144	11485	72794	0.1%	1.7%	0.4%	2.6%	4.3%	4.8%	
1981	3131342	3780	46807	12133	80236	0.1%	1.5%	0.4%	2.6%	4.1%	4.6%	
1982	3259224	3856	42935	11723	79845	0.1%	1.3%	0.4%	2.4%	3.8%	4.2%	
1983	3534934	4079	52006	13092	84979	0.1%	1.5%	0.4%	2.4%	3.9%	4.4%	
1984	3932722	4201	56163	15310	95679	0.1%	1.4%	0.4%	2.4%	3.9%	4.4%	
1985	4213016	3976	56351	15730	94698	0.1%	1.3%	0.4%	2.2%	3.6%	4.1%	
1986	4452851	3832	61111	16798	99705	0.1%	1.4%	0.4%	2.2%	3.6%	4.1%	
1987	4742462	4339	69690	18493	108993	0.1%	1.5%	0.4%	2.3%	3.8%	4.2%	
1988	5108325	4710	72046	18875	122883	0.1%	1.4%	0.4%	2.4%	3.8%	4.3%	
1989	5489061	4922	74409	19518	131896	0.1%	1.4%	0.4%	2.4%	3.8%	4.2%	
1990	5803246	5062	74228	19436	132425	0.1%	1.3%	0.3%	2.3%	3.6%	4.0%	
1991	5986208	4790	70491	18501	130131	0.1%	1.2%	0.3%	2.2%	3.4%	3.7%	
1992	6318934	5877	81767	20386	133063	0.1%	1.3%	0.3%	2.1%	3.4%	3.8%	
1993	6642328	6782	94270	21576	133262	0.1%	1.4%	0.3%	2.0%	3.4%	3.9%	
1994	7054315	6999	103503	23358	143649	0.1%	1.5%	0.3%	2.0%	3.5%	3.9%	
1995	7400534	6989	104945	24457	173718	0.1%	1.4%	0.3%	2.3%	3.8%	4.2%	
1996	7813170	6542	106520	25072	160662	0.1%	1.4%	0.3%	2.1%	3.4%	3.8%	
1997	8318376	5786	111378	27792	158493	0.1%	1.3%	0.3%	1.9%	3.2%	3.6%	
1998	8781527	5690	114620	30189	163813	0.1%	1.3%	0.3%	1.9%	3.2%	3.6%	
1999	9268604	6207	123062	31909	166936	0.1%	1.3%	0.3%	1.8%	3.1%	3.5%	
2000	9872938	5316	112512	33691	180157	0.1%	1.1%	0.3%	1.8%	3.0%	3.4%	

Sources: USDC BEA 2002a, b; SIC 25, 1977–1992, USDC BOC (1995a,b); SIC 25, 1993–1996, USDC BOC (1998).

**Table 32-3. Medicinal market, millions of dollars**

Year	Total herbal market (may overlap with medicinal plant-based products)	Retail, medicinal plant-based product (may overlap with total herbal market)	Retail, commercial herb species (portion of medicinal plant-based products)
1992	1,000 <sup>a</sup>	—	—
1996	2,500 <sup>b</sup>	1,800 <sup>c</sup>	—
1998	—	4,000 <sup>c</sup>	688 <sup>d</sup>

Sources: <sup>a</sup> Mater (1997); <sup>b</sup> Klink (1997); <sup>c</sup> Brevoort (1998); <sup>d</sup> Blumenthal (1999).

**Table 32-4. Value of floral greens and wild edible mushrooms in the Pacific Northwest, million current dollars**

Product	Location	1985	1989	1992	1994
Floral greens	Washington, Oregon, SW British Columbia	—	128.5	—	106.8
Wild edible mushrooms	Washington, Oregon, Idaho	21.5	38.6	41.1	—

Sources: Floral greens, Schlosser et al. (1991), Blatner and Schlosser (1997); mushrooms, McRobert (1985), Schlosser and Blatner (1995).

**Table 32-5. Hunting and trapping establishments, receipts, and payroll**

Year	Number of establishments	Receipts (million current dollars)	Payroll (million current dollars)
1992	179	—	—
1997	295	224.3	48.9
1998	345	—	58.6
1999	360	—	68.9

Source: USDC BOC (2002).

Note: 1992–1997 data are SIC 0971; 1998–1999 data are NAICS 1142.