

## **Indicator 39. Level of expenditure on research, development, and education**

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### **I. Indicator Presentation**

#### **A. Rationale for use of the indicator**

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

New knowledge through research and development, and its communication, extension, and education to practitioners and the public will improve the practice of forest management in economic, social, and environmental terms.

**Approaches to measurement.** Countries will need to identify and categorize expenditures against each of the components of this indicator – research, development, and education. Data for measuring this indicator might include national expenditure on the following:

- Forest related research and development (report natural forest and plantations separately, where possible)
- Skills and professional training related to the forest sector
- Formal public education and awareness programs, e.g., school programs
- Informal public education to improve awareness of forestry issues

Measurement of this indicator may include collection and analysis of data from government, universities or equivalent institutions, nongovernment organizations, research organizations and industry sources. Relevant information might be available from existing surveys by data collection agencies, or it might be necessary to arrange new surveys.

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

Increasing expenditure may indicate an increasing commitment to forest-related research and development, training, extension and education. Interpretation of trends should take account of national and management objectives and policies. This indicator does not address the specific benefits flowing from expenditure in these three areas.

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

The Rationale of the TAC notes needs to be broadened to include not just forest management but the processing of wood products and nonwood products as well.

- In the TAC notes Interpretation there is the phrase, “should take account of national and management objectives and policies,” but these objectives and policies do not exist in the United States.
- Increasing expenditure of resources does not necessarily mean investment quality.

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

To meet the intent of the indicator to provide data on research we provide data on funding for forestry-related research at U.S. universities and the USDA Forest Service. To meet the intent of the indicator to provide information on education we provide data on staff years devoted to forest land extension efforts at U.S. universities.

- Forestry research funding at U.S. universities that are partially funded by the Cooperative State Research, Education, and Extension Service by RPA Region, 1995–2000 (thousand 1996 dollars) (Table 39-1)
- Funding for Forest Service Research, 1978–2000 (million 1996 dollars) (Table 39-2)
- University Extension staff years devoted to forest land related activities, selected years 1989–2004 (Table 39-3)
- Extension staff years on forest land related activities per million acres of forest land, selected years, 1989–2004 (Table 39-4)

## **C. How should the data be interpreted relative to the rationale from the TAC**

Data on funding for forestry related research and development at universities has increased 8.3 percent between 1995 and 2000. Over this time Federal funds decreased 4.2 percent, while non-Federal sources, primarily State and industry sources increased 7.5 percent. Overall funding increased most in the South, somewhat less in the Rocky Mountains, was stable in the North and declined in the Pacific Northwest. Data are not available indicating the portions of funding for development versus research.

Data on funding for forestry related research and development by the Forest Service in the form of appropriated funds (does not include outside funding) increased 18 percent between 1990 and 2000. In recent years outside funding has added about 11 percent to this total.

Data on University Extension education efforts related to forest land management indicates staff years increased 22 percent between 1989 and 1999. Staff years have increased in all regions. The largest number of staff years is related to Production followed by Utilization, Environmental education, Environmental Quality, then continuing education. The largest number of staff years per million acres of forest land is in the North and South, followed by the Pacific Coast then the Rocky Mountains.

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

The data on research and development related to forest land management at universities only includes universities that obtained some funding through the USDA Cooperative State Research, Education, and Extension Service. This includes most of forest land management research funding but not all. The data includes industry funding of research at universities but we do not show data on research funded and conducted by industry.

The data on extension education is for efforts focused on forest land management and does not include funding for extension that may partly include forest land such as outdoor recreation, fish and wildlife or the environment and public policy.

**E. If current data is not adequate to measure the indicator, what options are available for remedy?**

Additional data may be obtained on research funded and conducted by industry.

**III. Cross-cutting issues/relationships with other indicators**

The data from Indicators 63-67 on capacity to conduct and apply research should also be studied to understand the amount of effort devoted to research and extension.

## References

Smith, W.B., J.S. Vissage, R. Sheffield, and D.R. Darr. 2001. Forest resources of the United States, 1997. Forest Service, General Technical Report, NC-219, St. Paul, MN. 109 p.

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USDA, CSREES. 2001. Renewable resources education – Improving the environment and productivity of forests and rangeland through extension education – a report to Congress on the 1996-2000 Renewable Resources Extension Program, PL-95-306, and Renewable Resources Extension Act of 1978. Washington, DC.

USDA, CSREES. 2002. Personal communication with Eric Norland. Washington, DC.

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Table 39-1. Forestry research funding at U.S. universities that are partially funded by the Cooperative State Research, Education, and Extension Service by RPA Region, 1995–2000 (thousand 1996 dollars)

FY	CSREES	Other Federal	State	Industry	Self-Generated	Other Non-Federal	Total	
North								
1995	4,662	4,841	21,179	2,449	321	2,466	35,917	
1996	4,977	4,960	20,651	2,597	337	2,607	36,129	
1997	4,964	3,959	20,632	2,212	323	2,515	34,604	
1998	4,997	4,780	20,886	2,278	246	2,303	35,490	
1999	4,818	4,624	21,083	2,459	462	2,389	35,835	
2000	4,881	4,700	20,286	2,180	307	2,678	35,034	
South								
1995	9,436	9,158	26,418	3,684	1,071	6,589	56,357	
1996	8,997	9,679	25,447	3,909	1,252	6,732	56,016	
1997	8,844	9,269	26,078	4,510	1,245	6,361	56,307	
1998	8,889	8,937	26,129	5,015	1,742	6,600	57,311	
1999	9,437	8,625	28,498	4,711	1,813	9,335	62,419	
2000	9,423	10,172	29,509	4,612	2,118	10,189	66,022	
Rocky Mountains								
1995	3,043	6,917	8,517	1,480	1,455	1,705	23,117	
1996	3,026	6,634	9,055	1,946	1,706	2,056	24,423	
1997	3,008	8,009	9,476	1,649	1,810	2,988	26,940	
1998	2,931	8,618	8,160	1,321	1,328	4,741	27,100	
1999	2,848	6,248	8,269	878	1,700	3,930	23,874	
2000	2,892	8,923	7,885	1,034	2,055	4,017	26,807	
Pacific Coast								
1995	5,280	15,117	16,764	2,778	2,702	4,105	46,746	
1996	5,308	14,189	16,666	2,863	3,556	4,734	47,316	
1997	4,942	12,672	17,953	3,456	4,032	3,960	47,014	
1998	3,876	13,049	16,766	3,628	3,988	3,086	44,394	
1999	4,102	14,506	16,570	3,846	6,591	3,344	48,960	
2000	4,116	12,955	17,639	3,739	5,953	3,124	47,526	
U.S. Total								
FY	Hatch	Multistate Hatch	McIntire Stennis	Other CSREES	Total CSREES	Other Fed	Non Fed	Total
1995	1,861	485	20,134	5,317	27,797	41,069	126,492	195,359
1996	1,859	576	19,347	5,928	27,710	40,854	128,884	197,448
1997	1,768	585	19,011	5,939	27,303	38,521	131,040	196,863
1998	1,415	484	18,782	5,302	25,983	40,224	130,047	196,254
1999	1,601	498	19,820	5,416	27,335	39,019	139,748	206,101
2000	1,589	403	19,328	5,321	26,641	44,185	140,862	211,689

**Regional fund categories**

CSREES: total forestry research funding from all CSREES sources

Other Federal: Funding from any Federal source other than USDA CSREES

State: funding provided by State government

Industry: funds from industry

Self generated: funds generated by universities

Non-Federal: funds from industry, State government, or self generated

**U.S. Total categories**

Hatch funds: from Hatch Act for Agricultural Experiment Stations.

Multistate: Hatch Act funds for multistate projects

McIntire Stennis funds: Funding from the Cooperative Forestry Research Act (McIntire Stennis)

Other CSREES: Funding from other CSREES programs (e.g., Evans-Allen, IFAFS)

Other Federal: Funding from any Federal source other than USDA CSREES

Source: (USDA CSREES 2002), dollars deflated by GDP implicit price deflator

Table 39-2. Funding for Forest Service Research, 1978–2000 (million 1996 dollars)

Fiscal Year	Appropriated Funding	External funds	General Administration funds
1978	221.2	25.2	
1979	216.3	21.1	
1980	201.8	20.4	
1981	207.5	24.8	
1982	201.9	17.8	
1983	186.4	14.7	
1984	181.4	11.7	
1985	194.5	11.0	18.6
1986	187.0	14.8	16.6
1987	200.2	20.1	18.2
1988	196.8	19.3	17.3
1989	192.0	20.4	18.7
1990	201.7	16.1	18.0
1991	215.1	22.1	21.1
1992	225.3	33.8	21.5
1993	223.2	30.2	19.5
1994	230.6	23.5	18.5
1995	225.5	27.6	19.3
1996	203.7	15.3	16.6
1997	206.5		16.1
1998	213.2		15.6
1999	220.9		14.1
2000	238.1		
2001	247.3		
2002	256.4		

Source: Personal communication, April 2002, Office of the Deputy Chief for Research, Forest Service

Table 39-3. University Extension staff years devoted to forest land related activities, selected years 1989–2004

Year	Production	Environmental Quality	Utilization	Environmental Education	Continuing Education	Total
North						
1989	29.1	9.2	19.2	7.1	9.2	73.8
1994	31.5	11.8	21	11.7	10	86
1999	31.4	17.8	20.5	16.6	9.9	96.2
2004	38	23.3	21.2	24.3	10.5	117.3
South						
1989	39.2	11.3	23.2	18.2	11.4	103.3
1994	42.1	15	27.4	18.5	10.5	113.5
1999	49.4	16.3	23	16.9	12.6	118.2
2004	55.2	21.2	25.6	18.8	14.6	135.4
Rocky Mountain						
1989	4.2	2.7	2.6	2.2	1	12.7
1994	4.5	2.7	2.9	3	0.9	14
1999	4.2	6.35	5.15	3.55	3	22.25
2004	4.6	6.45	5.4	3.75	3.2	23.4
Pacific Coast						
1989	24	4.6	15.3	8	2.1	54
1994	25.8	4.8	14.3	8.7	2.1	55.7
1999	23.3	6.3	18.4	9.5	3.8	61.3
2004	25.9	7	18.7	10	5	66.6
U.S. Total						
1989	96.5	27.8	60.3	35.5	23.7	243.8
1994	103.9	34.3	65.6	41.9	23.5	269.2
1999	108.3	46.75	67.05	46.55	29.3	297.95
2004	123.7	57.95	70.9	56.85	33.3	342.7

Source: (USDA CSREES 2002) and (USDA CSREES 2001)

Note: Forest land extension includes forest land management, use and sustainability. The most common topics were sustainability, taxation, stewardship, water quality, harvesting, and sources of landowner assistance.

Table 39-4. Extension staff years on forest land related activities per million acres of forest land, selected years 1989–2004

Year	North	South	Rocky Mountains	Pacific Coast	Total
1989	0.43	0.48	0.09	0.25	0.33
1994	0.50	0.53	0.10	0.25	0.36
1999	0.56	0.55	0.16	0.28	0.40
2004	0.69	0.63	0.16	0.30	0.46

Source: (USDA CSREES 2002) and (USDA CSREES 2001)