

Indicator 61. Capacity To Measure and Monitor Changes in the Conservation and Sustainable Management of Forests, Including Scope, Frequency, and Statistical Reliability of Forest Inventories, Assessments, Monitoring, and Other Relevant Information

What Is the Indicator and Why Is It Important?

Public discussion and decisions related to natural resource sustainability issues should be based on comprehensive, current, and sound data. Information regarding the frequency, coverage, and reliability of data provides analysts with critical information for evaluating and prioritizing sustainability needs.

What Does the Indicator Show?

Data for the 67 indicators range from full, current coverage to one-time studies, to very anecdotal information. By looking at a cross-section of the information in three broad categories, a brief overview of the situation for each criterion can be seen. Few

indicators have a full suite of data that is current, national in scope, and collected frequently. The most persistent gap is the lack of systematic national data collection for many indicators. Given the numerous gaps, all data presented are considered reliable as the best data currently available. The following table summarizes the status of each indicator.

Criterion	Indicator	Data status			
		Coverage	Currency	Frequency	
1 Conservation of Biological Diversity	1	Extent of area by forest type relative to total area			
	2	Extent of area of forest by type and by age-class or successional stage			
	3	Extent of area by forest type in protected area categories as defined by IUCN or other classification systems			
	4	Extent of area by forest type in protected areas as defined by age-class or successional stage			
	5	Fragmentation of forest types			
	6	Number of forest-dependent species			
	7	Status (threatened, rare, vulnerable, endangered, or extinct) of forest-dependent species at risk of not maintaining viable breeding populations as determined by legislation or scientific assessment			
	8	Number of forest-dependent species that occupy a small portion of their former range			
	9	Population levels of representative species from diverse habitats monitored across their range			
2 Maintenance of Productive Capacity of Forest Ecosystems	10	Area of forest land and net area of forest land available for timber production			
	11	Total growing stock of merchantable and nonmerchantable tree species on forest land available for timber production			
	12	Area and growing stock of plantations of native and exotic species			
	13	Annual removal of wood products compared to the volume determined to be sustainable			
	14	Annual removal of nontimber forest products (e.g., fur bearers, berries, mushrooms, game) compared to the levels determined to be sustainable			
3 Maintenance of Forest Ecosystem Health and Vitality	15	Area and percentage of forest affected by processes or agents beyond the range of historic variation (e.g., by insects, disease, competition from exocytic species, fire, storm, land clearance, permanent flooding, salinisation, and domestic animals).			
	16	Area and percentage of forest subject to specific levels of air pollutants or ultraviolet B that may cause negative effects on the forest			
	17	Area and percentage of forest land with diminished biological components indicative of changes in fundamental ecological processes and/or ecological continuity			
4 Conservation and Maintenance of Soil and Water Resources	18	Area and percentage of forest land with significant soil erosion			
	19	Area and percentage of forest land managed primarily for protective functions (e.g., watersheds, flood protection, avalanche protection, riparian zones)			
	20	Percentage of stream kilometers in forested catchments in which stream flow and timing have deviated significantly from the historic range of variability			
	21	Area and percentage of forest land with significantly diminished soil organic matter and/or changes in other soil chemical properties			
	22	Area and percentage of forest land with significant compaction or change in soil physical properties resulting from human activities			
	23	Percentage of water bodies in forest areas (e.g., stream kilometers, lake hectares) with significant variance of biological diversity from the historic range of variability			
	24	Percentage of water bodies in forest areas with significant variance from the historic range for dissolved oxygen, temperature, electrical conductivity, acidity (pH), and sedimentation			
	25	Area and percentage of forest land experiencing an accumulation of persistent toxic substances			

Criterion	Indicator	Data status		
		Coverage	Currency	Frequency
5 Maintenance of Forest Contribution to Global Carbon Cycles	26 Total forest ecosystem biomass and carbon pool, and if appropriate, by forest type, age-class, and successional changes			
	27 Contribution of forest ecosystems to the total global carbon budget			
	28 Contribution of forest products to the global carbon budget			
6 Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits To Meet the Needs of Societies	29 Value and volume of wood and wood products production, including value added through downstream processing			
	30 Value and quantities of production of nonwood forest products			
	31 Supply and consumption of wood and wood products, including consumption per capita			
	32 Value of wood and nonwood products production as a percentage of GDP			
	33 Degree of recycling of forest products			
	34 Supply and consumption/use of nonwood products			
	35 Area and percentage of forest land available for general recreation and tourism, in relation to the total area of forest land			
	36 Number and type of facilities available for general recreation and tourism in relation to population and forest area			
	37 Number of visitors days attributed to recreation and tourism in relation to population and forest area			
	38 Value of investment, including investment in fast-growing forest health management, planted forests, wood processing, recreation, and tourism			
	39 Level of expenditure on research and development and on education			
	40 Extension and use of new and improved technologies			
	41 Rates of return on investment			
	42 Area and percentage of forest land managed in relation to the total area of forest land to protect the range of cultural, social, and spiritual needs and values			
	43 Nonconsumptive forest use and values			
	44 Direct and indirect employment in the forest sector and the forest sector employment as a proportion of total employment			
	45 Average wage rates and injury rates in major employment categories within the forest sector			
46 Viability and adaptability to changing economic conditions of forest-dependent communities, including indigenous communities				
47 Area and percentage of forest land used for subsistence				
7 Legal, Institutional, and Economic Framework; Capacity To Measure and Monitor Changes; and Capacity To Construct and Apply Research and Development for Forest Conservation and Sustainable Management	48 Clarifies property rights, provides for appropriate land tenure arrangements, recognizes customary and traditional rights of indigenous people, and provides a means for resolving property disputes by due process			
	49 Provides for periodic forest-related planning, assessment, and policy review that recognizes the range of forest values, including coordination with relevant sectors			
	50 Provides opportunities for public participation in public policy and decisionmaking related to forests and public access to information			
	51 Encourages best practice codes for forest management			
	52 Provides for the management of forests to conserve special environmental, cultural, social, and/or scientific values			
	53 Provide for public involvement activities and public education, awareness, and extension programs, and make available forest-related information			
	54 Undertake and implement periodic forest-related planning, assessment, and policy review, including cross-sectoral planning and coordination			

Criterion	Indicator	Data status		
		Coverage	Currency	Frequency
	55 Develop and maintain human resource skills across relevant disciplines			
	56 Develop and maintain efficient physical infrastructure to facilitate the supply of forest products and services and to support forest management			
	57 Enforces laws, regulations, and guidelines			
	58 Investment and taxation policies and a regulatory environment that recognizes the long-term nature of investments and permits the flow of capital in and out of the forest sector in response to market signals, nonmarket economic valuations, and public policy decisions in order to meet long-term demands for forest products and services			
	59 Nondiscriminatory trade policies for forest products			
	60 Availability and extent of up-to-date data, statistics, and other information			
	61 Scope, frequency, and statistical reliability of forest inventories, assessments, monitoring, and other relevant information			
	62 Compatibility with other countries in measuring, monitoring, and reporting on indicators			
	63 Development of scientific understanding of forest ecosystem characteristics and functions			
	64 Methods to integrate environmental and social costs and benefits into markets, public policies, and national accounting systems			
	65 New technologies and the capacity to assess the socioeconomic consequences associated with the introduction of new technologies			
	66 Enhancement of the ability to predict effects of human intervention on forests			
	67 Capacity to predict effects on forests of possible climate change			

KEY				
Notes on the rating system: This rating provides a general overview of the data supporting the indicators. Green means few gaps, orange means several gaps, red means no data or numerous gaps, and yellow indicates data that has been modeled.		Data coverage	Data currency	Data frequency
Data generally complete nationally, current, and reliable.		National	1997+	Annual to < 5-year periodic
Data may not be consistent nationally, slightly dated, and not measured frequently enough.		Regional or some national	1980-1996	5+ year periodic
Data is from inconsistent sources or is nonexistent, is more than 15 years old, or is partial, and has no consistent plan for remeasurement.		Varies or incomplete	Incomplete	One time or incomplete
Data is modeled				