

Indicator 40. Extension and Use of New and Improved Technologies

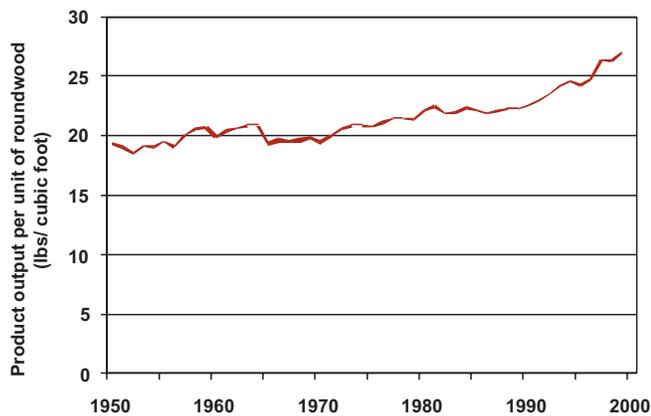


Figure 40-1. Wood and paper product output per unit of roundwood input, 1950–1999 (lbs per cubic foot).

What Is the Indicator and Why Is It Important?

This indicator measures improvements in forest management and forest products industries that affect forest management. These improvements can conserve, help manage, or help produce goods and services and can have environmental and economic effects. The effects of these changes are shown in other indicators. The indicator does not cover improvements affecting forest-based recreation and tourism.

What Does the Indicator Show?

Technology changes have affected each stage of production, processing, and use of wood in recent decades: Forest management for timber production and environmental protection has been changed by improvements in genetic stock of trees, insect and disease treatments, fire treatments and protection, and improvements in silvicultural regimes, including establishment and fertilizers. Harvesting systems and practices have improved to provide greater yield of timber at lower cost and lower environmental impact for each type of forest condition. Processing to make existing solidwood and pulp and paper products has

improved, including improvements in (1) sawing to allow changes in size of trees or species needed to make structural-grade or appearance-grade lumber, (2) product output per unit of wood input, (3) lower costs, (4) emissions from processing, (5) new grading regimes to identify wood with special qualities for high-performance use, such as machine stress rating for use in trusses, and (6) techniques to clean recycled paper and improve its stiffness and bonding to allow increased paper recycling. New wood products, such as reconstituted panels, wood/plastic composites, laminated veneer lumber, wooden I joints, glulam beams that allow for use of smaller trees and different species of trees as well as wood residue, recycled wood, and nonwood materials (e.g., plastics), have been developed. Improvements in wood and paper products processing and new products have affected forest management over the last 50 years by increasing products output per unit of roundwood input (harvest needed) by 40 percent, due to increased paper recycling, use of wood residue for products, and increased processing efficiency. Use of wood for energy has increased and includes use of pulping liquor for energy at pulp mills, higher efficiency stoves for residential wood burning, and use of wood for electric power production. Changes in application of solidwood and paper products in uses have allowed for more efficient and diverse uses of wood, including use of wood trusses in structures, substitution of wood composite panels for lumber and softwood plywood in structures, use of wood for housing basements, expanded use of paper for computer printers, and new uses of paperboard in packaging. Development of substitutes for solidwood products and paper products in applications has influenced wood use. This includes use of vinyl and aluminum siding for buildings, light steel framing for residential structures, and electronic communication media for paper. Recycling of paper, mill residues, and solidwood products has influenced the use of wood. This includes use of recycled paper to make new paper and paperboard products, mill residues for composite panels and for paper production, recycling of wooden pallets, and recycling of wood from deconstructed structures.