

Agroforestry and Sustainability: Making a Patchwork Quilt



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The US population is growing by 3 million each year, creating an increased demand for wood fiber and exerting pressure to convert forests to commercial and residential development. Forestry is challenged with meeting the future demand for wood products *and* an expanding array of social objectives. The challenge is finding ways to sustain the production of goods and services that society derives from forests in ways that meet current needs without compromising future generations.

The United States participated in the Montreal Process on sustainable forest management and joined nine other temperate forest countries in a commitment to sustainable forestry when it signed the Santiago Declaration in 1995. The first six of the seven criteria of the Montreal Process can be viewed as a statement of the goods and services that society derives from its forests: biological diversity, wood and nontimber products, healthy ecosystems, soil and water resources, carbon cycles, multiple socioeconomic benefits, and legal and institutional frameworks.

There are places in the United States that are already experiencing difficulty with some of those criteria. The fragmentation of forests across some landscapes has reduced populations of many plant and animal species that rely on forest habitat. In other regions there are projections of inadequate wood supply. Insufficient water quality and aquatic habitat now affect most regions. In some regions, for some specific goods and services, we cannot meet society's expectations.

One solution may lie in agroforestry. Agriculture and forestry account for more than 75 percent of the land use in the United States. Too often we treat agriculture and forestry separately when addressing natural resource concerns. Yet agriculture and forestry share many goals, and a high

proportion of US watersheds and landscapes are an interwoven mosaic of both uses. Rural communities often depend on both agriculture and forestry to remain economically viable.

Agroforestry is the intentional blending of forestry production and conservation practices with those of agriculture. It generates short-term economic benefits while the landowner waits for traditional, longer-term forestry products. For example:

- Windbreaks can provide corridors across agricultural lands to connect forest fragments and increase wildlife benefits while protecting soils, crops, and livestock.

- Riparian forest buffers on farms and ranches can protect surface water from sediments, nutrients, and contaminants while enhancing aquatic habitats and sequestering carbon.

- Short-rotation woody crops grown on farmlands can provide economic benefits for farmers while helping meet the nation's demand for wood fiber and energy.

- Farm woodlots can be used to grow specialty products like ginseng or mushrooms under a modified forest canopy, thereby encouraging timber stand improvement practices.

- Grazing-timber systems allow farmers to generate annual income by grazing livestock under thinned conifer stands (> 50 percent light penetration) while producing high-quality sawlogs.

- Trees provide the local community with social benefits and create a buffer from agricultural activities.

Sustainable development is a challenge for society in many respects, but perhaps the most difficult challenge is finding solutions that balance forestry with the sustainability of other sectors, like agriculture and communities. It is important that forestry criteria and indicators inform this debate. Sustainable development is really an optimiza-

tion problem whose solution is changing over time as communities strive to adapt to increasing pressures.

Suppose we find a forest owner who meets our criteria for sustainable forest management. Let's give this owner an award. "Great job!" we say. What if one year later the forest has been cut and houses built? Before we can scold last year's award recipient, he points out that he is still practicing sustainable development; he has just switched to sustainable *community* work.

He may be right. The greatest need for his community may have been housing, and converting his forested tract may have caused the fewest detriments and most benefits. To have paved over adjacent farmland or filled in nearby wetlands, for example, may have been even less desirable. When we weight economic, social, and environmental benefits, criteria for sustainable forest management can help ensure that the trade-offs of various options are considered, their consequences projected into the future, and the likely results clearly understood by communities.

With more than 80 percent of Americans now living in urban or suburban environments, it is important that people understand how much of what they value is derived from forests. They need to understand that clean water does not just happen—that the materials they consume and the wastes they generate have associated consequences and responsibilities. And then they need to know that the solutions must encompass all lands. Otherwise, it is like trying to make a patchwork quilt without bothering to sew the pieces together: everything comes unraveled.

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