**Definition: Deforestation** from *Philip's Encyclopedia*

Clearing away of forests and their ecosystems, usually on a large scale, by humans. It may be done to create open areas for farming or building, or for timber. There is an immediate danger that the vital topsoil will be eroded by wind (such as the dust bowl, USA) or, in hilly areas, by rain. Proposals to clear whole regions of the Amazonian rainforests, which play a key role in maintaining the oxygen balance of the Earth, could cause an environmental catastrophe.

**Summary Article: Deforestation** from *Encyclopedia of Crisis Management*

Forests are generally defined by the amount of tree canopy cover; deforestation is removal of tree cover. Deforestation is the practice of removing tree cover and converting covered forested lands to nonforest uses, resulting in the permanent destruction of the forest. Deforestation accounted for an annual loss of 16 million hectares (39 million acres) of forest through the 1990s and dropped to 13 million hectares (32 million acres) annually in the first decade of the 21st century.

The Southern Hemisphere accounts for the majority of forest loss, with South America (4 million hectares [8.9 million acres]) and Africa (3.4 million hectares [8.4 million acres]) accounting for a little over half of global forest canopy loss. Forest utilization in the less-developed countries is a result of rapid urbanization, population growth, and economic demands for forest products. European forests have continued to expand, while those in North and Central America have remained stable. Australia has been losing forest since 2000 as a result of considerable drought-related issues and forest fires. The tropical areas are being deforested at a faster rate than other areas globally. For example, from 2000 to 2005, deforestation in tropical areas increased by 8.5 percent compared to the 1990s. During the same time, the loss of old-growth forest in Nigeria and Vietnam doubled, and it tripled in Peru. The largest forest in the world is the Amazon rainforest, covering 550 million hectares (1.3 billion acres). Sixty percent of the Amazon rainforest is located in Brazil, and the remaining 40 percent is located in the countries of Bolivia, Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname, and Venezuela. Over the past 40 years, Brazil has deforested 60 million hectares (148 million acres) of the Amazon, primarily for cattle ranching (more than 60 percent) and subsistence farming (30 percent). As a comparison, the United States has deforested 215,228 hectares (531,840 acres). Globally, the reasons for deforestation include agriculture production (i.e., fruit tree [banana], soybean, and palm oil plantations), clear-cutting (e.g., for pulpwod and charcoal), mining (e.g., open pit and large scale), the creation of livestock pastureland, human settlements, and infrastructural projects (dams, road systems). The most common reasons for converting deforested land globally are subsistence farming (46 percent), commercial agriculture (32 percent), logging (14 percent), and for fuel products (5 percent), according to the United Nations Framework Convention on Climate Change (UNFCCC).
A peat forest in Indragiri Hulu, Riau Province, Indonesia, is deforested to make way for an oil palm plantation, a highly lucrative venture and one in which Indonesia is now the leading supplier. According to the WorldWatch Institute, deforestation of peat bogs and native tropical forests to plant oil palm plantations creates numerous crises, such as species endangerment, the uprooting of local communities, and the release of methane gases that contribute to global warming.

Effects

Deforestation results in soil degradation, water cycle disruption, loss of biodiversity, increased flooding and drought, and increases in carbon dioxide (CO₂) in the atmosphere. The removal of forest cover and vegetation exposes the soil to direct sunlight, resulting in drought conditions, and the nutrient-rich topsoil is lost to wind and runoff erosion, increasing sedimentation in streams, rivers, and wetlands, thus preventing future forest regeneration because of soil degradation. Ultimately, the severity of the topsoil degradation results in its being unworkable, and the land becomes a barren wasteland.

The water cycle is significantly disrupted by deforestation. The process of transpiration is disrupted by the loss of trees and vegetation. Transpiration is the process of trees and plants drawing up groundwater, commonly with their roots, then releasing the water (evaporation) into the atmosphere via pores in their leaves. Over half of the water in the Amazon rainforest is circulating inside the trees and plants. Trees also absorb precipitation and runoff, thus preventing topsoil erosion. The loss of trees increases soil erosion and diminishes the replenishing of the water table. Trees also absorb heavy precipitation, and without trees, the unabated runoff can result in floods. Ultimately, the loss of water cycle results in the land becoming a barren wasteland as well as the surrounding area becoming susceptible to flooding.

The loss of trees, vegetation, topsoil, and the water cycle results in significant biodiversity loss. This is particularly acute in tropical regions, which harbor almost half of the Earth’s species but account for less than 10 percent of the dry land. The tropical animal and plant species are very diverse and highly specialized to specific microhabitats and ecosystems. Deforestation in these highly specialized microhabitats can result in specific animal and plant species becoming threatened and even extinct.

Forests are like the lungs of the Earth, because they absorb and store carbon dioxide from the atmosphere (a biological process called biosequestration), which is converted to nutrients for the tree. When the tree dies and rots, is cut down, or is burned, the stored carbon is released as CO₂ back into the environment. Trees lost to deforestation result in more CO₂ being released in a small time window.
than trees dying naturally. Deforestation is estimated to be contributing to between 20 and 30 percent of the total of human-caused (anthropogenic) CO₂ emissions. These carbon emissions are a major contributor to climate change.

**Conflict in the Forest**

There are some positive and negative socioeconomic results from deforestation. On the positive side, deforestation can be viewed as making positive changes to the rural and remote forest people. The benefits are building communities, colonizing regions, and providing an economic base for impoverished areas. Harvesting of the forest allows for economic growth as well as the lumber for building homes, buildings, and factories. Roads and bridges are pushed through, which open areas for trade and provide transport routes, allowing new products in rural and remote areas. Small-scale farms can supply agricultural products to other regions and provide locals with a modest income.

These same perceived benefits have also created friction. First, economic and development decisions do not significantly include the indigenous people most affected by the plans. Next, not all areas are interested in the changes, and some groups view the changes as destroying their way of life. As a result, deforestation creates conflict (sometimes violent) between the local indigenous people and those modernizing under governmental approval. The conflict is also over ancestral rights and governmental rights, as the encroachment onto indigenous lands is seen as ignoring the rights and removing the livelihood of the indigenous people. Millions of indigenous people already make their living from the tropical forest through subsistence (hunting and gathering) and/or harvesting forest products. The challenge to governments is balancing forest use/conservation, economic development, and needs of indigenous people.

**Reforestation**

One solution to buffering the effects of deforestation is reforestation. Reforestation is beneficial to humans and ecosystems because it enables the capture and storing of carbon dioxide. Planting trees is critical in reducing the effects of deforestation because trees prevent flooding and erosion, reduce topsoil loss, and prevent increased sedimentation in streams, rivers, and wetlands. Reforestation benefits water bodies as well through aquifer recharge, storage, and recovery, and recycling inland rainfall. Tree planting and maintaining topsoil are essential for rebuilding natural habitats for plants and wildlife.

See Also

- Avalanches and Landslides
- Climate Change Adaptation
- Floods
- Global Warming
- Poverty
- Resource Collapse
- Resource Management
- Wildfire

**Further Readings**

Food and Agriculture Organization of the United Nations (FAO). “Global Forest Resources

Andrew Hund
Umea University

APA


Chicago

Harvard

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APA

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