

The Disappearing Rain Forests

By Jean Ratener, Ph.D.

Most tropical forests form a green band around the earth, extending roughly 10 degrees north and south of the Equator. Amazing as it may seem, these forests occupy less than eight percent of the Earth's entire land mass, yet they account for nearly half of all the growing wood on the planet and are the home for two-fifths of Earth's animal and plant species. It is because of the amazing diversity of species that the rain forests are so important to mankind, for we rely on these species for agriculture, medicine, and industry.

1.0 Natural Source of Products

At least a quarter of all pharmaceutical products are derived from tropical rain forests. An even more impressive statistic when you consider that less than one percent of all Amazon plants have been intensively examined for their medicinal properties.

Tropical rain forests have provided us with a wide array of medicines, including:

- analgesics
- antibiotics
- enzymes
- hormones
- diuretics
- anticoagulants

Of the 90,000 plant species in Latin America, only 10,000 have been tested for anti-cancer properties. Scientists expect that at least ten percent of the untested plants will reveal some form of anti-cancer activity. A species of alexa tree, found in the northern Amazon basin and in Madagascar, contains the plant alkaloid castanospermine, which is being studied at County Hospital in London as a possible treatment for forms of AIDS.

Vast quantities of rubber from the rain forests provide such mundane items as tires, gum, and running shoes.

2.0 Thousands of Species

The rain forests are the most complex and diverse ecosystems in the world. A one and a half hectare of rain forest can contain over two hundred different varieties of trees alone. One scientist discovered three thousand species of beetles within just five plots of twelve square meters each.

It is this remarkable diversity of plant and animal life that makes the jungles such an important resource for the planet. More than the greenhouse effect or any other negative impact deforestation may have, it is the loss of these species that makes it imperative we

preserve the remaining forests.

Habitat destruction is now the most important cause of species loss. If present trends continue, we can expect an annual rate of loss as high as fifty thousand species by the year 2000. At this rate, we would be driving 130 species into extinction every day.

The worst thing that can happen during the next decade is not energy depletion, economic collapse, limited nuclear war, or conquest by a totalitarian government. As terrible as these catastrophes would be for us, they can be repaired within a few generations. The ongoing process that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats.

3.0 Forecast for the Climate

Tropical rain forests help to stabilize the world's climate by absorbing solar radiation. They literally soak up sunshine. When forests are cleared, the "shininess" of Earth's land surface increases, radiating more of the sun's energy back into space. This is known as the albedo effect. An increase in albedo could lead to disruptions of convection patterns, wind currents, and rainfall in lands far beyond the tropics. Read: one's own backyard.

Although tropical rain forests do not significantly affect Earth's oxygen balance, their destruction does play an important role in the increase of carbon dioxide. When jungles are cleared, they are typically burned, releasing considerable quantities of carbon into the skies. Carbon dioxide levels in the atmosphere have increased by about 30% from 1850 to 1990—and are projected to leap a further 75% by 2060. The buildup of carbon dioxide in the atmosphere looks as if it is triggering a greenhouse effect that results in drier climates for some, especially Americans.

In the late 1980's, scientists began to detect an increase in fluorocarbons in direct proportion to the depletion of the ozone layer. Professor Martha Jefferis hypothesized the following formula for determining the effect of fluorocarbons on the ozone layer.

(Equation 1)

4.0 Environmental Reprieve

Because Nicaragua was in civil turmoil for over a decade, the rain forests there were actually able to stage a comeback. The lumber business was slowed considerably, and ranching was virtually halted. Both factors resulted in less of the rain forest being eliminated.

Guerilla occupation also halted colonization of forested areas that would otherwise have been developed. Before the conflict began, Nicaragua, the largest country in Central America, had the highest annual rate of rain forest loss.

Animals in the rain forest fared well, too, because sport hunting came to a standstill. Hunters were afraid of being mistaken for guerillas, and at one point, all non-military firearms were confiscated. Because the war was fought along the Mosquite Coast, commercial fishing was too risky, and sea turtle, manatee, shrimp, and lobster populations had the opportunity to

increase prolifically.

It's hoped that the gains established during the civil war will prompt leaders to practice conservation and keep the ecosystems that remain intact safe for generations to come. Because Nicaragua is economically and politically devastated, achieving a balance between the sustainable use of resources and preservation of them will be tricky. An agreement has been signed to establish a section of the rebounded jungle bordering Costa Rica as a "peace preserve." But many more environmental battles are yet to be fought, and need to be won, or Nicaragua will quickly succumb to the devastation that so-called progress always brings.

Time will tell if peace can benefit Nicaragua's natural resources as much as war did.

5.0 Evaporating Gene Pools

As rain forests disappear, so do the wild native plants that are the ancestors of our modern agricultural crops. Plant breeders rely on the genetic diversity provided by indigenous strains of wheat, rice, corn, and other grasses. Many of these strains are adapted to and can flourish under less than ideal conditions such as drought or flooding, or have shown high salt tolerance or resistance to diseases and insects.

Wild or traditional local varieties of the staple crops of Central and South America—corn, beans, tomatoes, and potatoes—have found their way to global markets, or given hybridizers desirable new traits to use in developing crosses with popular commercial varieties.

Many native crops are destroyed when rain forests and surrounding environments are cleared for forage, agriculture, or human habitation. To make matters worse, in many countries no government or business agencies have been responsible for storing the seeds of these indigenous crops to preserve them for future generations and prevent exploitation from large hybridizing companies. A few countries have begun to recognize the value of preserving their plant heritage and have taken steps to ban breeders from using their heirloom strains without due compensation to their governments.

Poverty and hunger have also contributed to the shrinking of the horticultural gene pool. Desperate farmers have been forced to eat the seed from their harvest to stay alive, and have been left with little to no seed to plant the next crop.

Even seeds of indigenous varieties that were apparently preserved may not have been saved from extinction. Many of the seeds stored in optimally controlled conditions in the United States government's Boulder, Colorado seed bank may not be viable anymore. No attempt was made to have the seeds grown from time to time to produce fresh seeds, and some of those seeds may no longer be secured.

The following table shows some of the animal species endangered from 1980-1990 in South America and Asia.

Table 1: Endangered Species 1980-1990

| | Birds | Fish | Reptiles |
|------|--------------|-------------|-----------------|
| Asia | 319 | 126 | 31 |

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|------------------|-----|-----|----|
| South America | 515 | 311 | 24 |
|------------------|-----|-----|----|