Tropical Forest Destruction versus Reforestation Strategies

Kris Phattaraphakin, Yuwalak Vejwitayaklung, Samith Jueajinda,
Wannapha Phopli, Uswin Chaiwiwat and Somjintana Jirayukul
Corresponding Author, E-mail: samith.j@dru.ac.th

****

Abstracts

Rainforests refer to all types of tropical moist forests. Tropical forests are usually characterized by rainfall and temperature. Vegetation in tropical areas that receive loss than twenty inches of rainfall per year consists of scrub brush and thorn woodlands. Broad-leaved deciduous forests (sometimes called moist forests) are found in the area where the rainfall reaches 39-157 inches a year. Generally, rain forests receive between 157 and 393 inches of rainfall per year, and the temperatures are higher, averaging eighty-one degrees F. Most significantly, rain forests have a much more diverse flora and fauna. A typical moist forest will only have half as many species as a rain forest, and a typical dry forest will have only a third as many species as a moist forest.

Keywords: Tropical Forest Destruction; Reforestation; Strategies

Introduction

Rainforests refer to all types of tropical moist forests. Tropical forests are usually characterized by rainfall and temperature. Vegetation in tropical areas that receive loss than twenty inches of rainfall per year consists of scrub brush and thorn woodlands. Broad-leaved deciduous forests (sometimes called moist forests) are found in the area where the rainfall reaches 39-157 inches a year. Generally, rain forests receive between 157 and 393 inches of rainfall per year, and the temperatures are higher, averaging eighty-one degrees F. Most significantly, rain forests have a much more diverse flora and fauna. A typical moist forest will only have half as many species as a rain forest, and a typical dry forest will have only a third as many species as a moist forest. Caufield, Catherine. (1985 : 154).

1. Importance of Tropical Forests

1.1 Natural Resources

A number of products we use and consume every day come from tropical forests. These include coffee, bananas, papayas, avocados, chocolate, mangoes, rubber, antibiotics, tranquilizers, analgesics, cosmetics, bread, rice, many vegetables, spices, doors, floors, furniture, plastics, waxes, resins, dyes, and many other household substances.

Tropical forests are the source of many natural pesticides. Insect pests consume 40% of the world's annual food crops. Plants in the forest cannot run away from those that would eat them and have developed biodegradable toxin specific to their insect predators. In fact, many tropical plants that are toxic to one insect are inhibited by another. Some of the toxic plants make the insect pest sick, while others cause it to molt at the wrong phase of the life cycle. This leaves the insect in a perpetual but harmless juvenile state. Other toxic plants inhibit the reproductive mechanism of the insects. Collins, Mark. (1990 : 210).

---

* Received: January 5 2023; Revised: January 16 2023; Accepted: January 18 2023

Tropical forests are source of medicines. Tribal people have long used the plants of the forests to provide the medicinal needs. Some thirteen hundred plant species are used as medicines and for related purposes in the northwestern Amazonia alone. Traditional healers in Southeast Asia use around sixty-five hundred plants in treating malaria, stomach ulcers, syphilis, and other disorders. Medicinal laboratories in the developed countries are screening a good number of other tropical plants to see what they might hold.

1.2 Environmental Interrelationships

Tropical forests create an intense rainfall while, at the same time, minimizing its destructive potential. Tropical forests cover one-sixteenth of the world's land surface, yet receive a full one-half of its rainfall. They absorb 75% of the rain, while the other 25% is transpired and evaporated back into the atmosphere. The forest then releases the water, slowly and evenly throughout the year, into the watercourses. When the forests are cleared, the water is immediately released, causing massive erosion, floods, and severe droughts in the dry season. A single storm in the humid tropics can wash over seventy tons of soil per acre into a river.

Deforestation in many tropical countries is causing landslides, rockfalls, and increased damage from earthquakes. Rain falling on denuded hillsides has caused landslides that have swept away roads and even villages. Terraced croplands have been washed away after the forest above them was cut for fuelwood. Forested lands are much more able to tolerate earthquakes when the land is protected by the trees. Myers, Norman. (1984 : 110).

The Panama Canal is threatened by siltation. In the 1950s, 85% of the watershed was covered with rain forests. By 1970, a third of that had been deforested for cattle ranching and crop growing. If the current trend continues, virtually all of the watershed will be deforested in the next twelve years. The problems are already starting to affect the operation of the canal.

In the Caribbean, many islands have lost all or most of their forests. Forests act as a buffer against cyclones and other freak weather phenomenon. Damage worldwide from cyclones now tops four billion dollars annually. This represents a sixfold increase in twenty years. Part of this increase is due to increased coastal population, but the largest part is due to deforestation.

1.3 Global Climate Connection

Tropical forests represent the largest mass of landlocked carbon. Burning the forest releases this carbon into the upper atmosphere, adding to the greenhouse effect.

When the sunlight meets the Earth's atmosphere, 24 % of the light can pass through the surface. Tropical forests absorb light and use it for photosynthesis. When a large amount of forest cover is removed, the ground reflects rather than absorbs the lights. That changes the overall heat balance, disrupting mass air circulation and causing changes in rainfall. If too much forest is removed, meteorologists expect that there will be an increase in rainfall in the arid zones immediately above the equator, together with a rainfall reduction in the major cereal-growing regions of the world.

The carbon released into the air by burning absorbs solar radiation, warming the air through the greenhouse effect. Although most of the current carbon buildup is attributed to automobile exhaust, deforestation contributes to the process. A temperature rise will cause the poles to melt, at least partially. According to the National Science Foundation, ocean levels have already started to rise. Thirty-five% of the world population lives within thirty-five miles of the coast, and many of our major cities may have to be relocated.

The bulk of Earth's 40,000 billion tons of carbon is locked away on the ocean bottoms. Large-scale atmospheric warming may cause a planetary feedback effect, causing the oceans, in turn, to release this carbon, warming the atmosphere even more. Many scientists believe that this is what happened between the Mesozoic and Cainozoic periods (225 million to 70 million years ago). The change in climate at that time resulted in the extinction of 75% of the Earth's species. Unfortunately, the climate changes we are beginning to experience are coming on much faster now than then. As the water warms, the chances of hurricanes become greater. Therefore, the hurricanes will occur more often and will be considerably more devastating. Judith S, Scherff. (1991 : 62).

2. Main Causes of Tropical Forest Destruction

2.1 Slash-and-Burn Agriculture

Slash-and-burn agriculture is the biggest cause of tropical forest destruction. At present, urban overpopulation leads governments to promote settlement of their wasteland, the forests. The forest is cut into piles of brush and allowed to dry before burning. The thick ash is loaded with the nutrients of the destroyed vegetation, and the first year of crops is good. The second year's crop is often less than that of the first. The forest floor, by this time, has been backed by the tropical sun, leached by heavy rain, and is unable to regenerate. The farmer cannot grow crops, and turns to another patch of forest to begin again. The Earth's oldest, most complex ecosystems are thus exterminated.

2.2 Logging

Tropical forests are increasingly destroyed as more people, especially citizens of developed countries, want more tropical hardwoods. An average American uses about one-and-a-half tons of wood each year. Wood is economically competitive compared to aluminum, steel, cement, and plastics, which require more energy in their production. Japan is the largest importer of tropical hardwoods, even though two-thirds of that country is forested, a greater proportion than any other developed countries.

2.3 Cattle in the forest

It is the large-scale cattle rancher that eliminates most forest in Central America and Brazilian and Colombian Amazonia. Ranching activities account for thirty thousand square kilometers of forest loss in this area. This is much less than the amount deforested by loggers and forest farmers in Asia and Africa, but the rancher's impact is growing fast due to international demand for beef. The United States accounts for most of this.

2.4 Rain Forest Roads

Without roads, which are usually funded by international lending institutes such as the World Bank, the forest would be destroyed at a much slower rate. The Trans Amazonian Highway in Brazil, connecting with Brasilia, was completed in 1959. It attracted 2.5 million settlers by 1978. Over a quarter of all Amazonian deforestation in Brazil from 1966 to 1975 was caused by highway construction.

2.5 Mining

Although mining itself is a minor cause of deforestation, associated activities such as road building, toxic effluents dumped in rivers, and siltation of rivers and lakes increases its impact considerably. Many tropical forest countries are rich in mineral resources. Many mineral deposit areas are also areas with a high number of endemic plants and animals. For this reason, the small area of deforestation can have a vastly destructive impact.

2.6 Hydroelectric Projects

Dams are other projects usually funded all or partially by multilateral lending institutions. Deforestation of the river's watershed has been one of the biggest problems. Settlers attracted by the dam often settle above it, taking out the forest that maintains the flow of clean water. The hard, tropical rainfall take much of the denuded soil direct into the river, where it is deposited into the reservoir. When the lake fills, the amount of water available for electrical generation steadily declines.

3. Reforestation Strategies

Tree-planting and reforestation programs have been going on for a long time, but the forests continue to be depleted. One reason is the demand for wood is not matched by our efforts at reforestation and afforestation. More efforts should be undertaken to reverse the trend. Several strategies have been applied to reforestation programs including: Secrett, Charles. (1984 : 47-60).

3.1 Subsidizing Reforestation

Most of the indigenous people and farmers are too poor to undertake reforestation on their own backyard without subsidy from the government or the private sectors. The costs of seedlings and fertilizer should be subsidized to encourage participation at the village level. The appropriate tree species and planting techniques should also be supported to the villagers.

3.2 Educating the People

There are many ways to slow down tree destruction. Educating our children and ourselves about the importance of planting and looking after trees. Recycling paper and other wood-based products will instill into the people and become the discipline. Children must be taught early to plant trees whenever possible and buy wood products from a sustainable source or stop buying products made from trees to reduce the demand.

3.3 NGOs and Reforestation

The NGOs have played an important role in bringing awareness to the government of many problems encountering the nations of the world. Many of the laws and international agreements were passed through their efforts. Many of their actions were done in the cooperation with governments and other organization. Some of their activities were focused on the world forests and their biodiversity.

3.4 Reforestation of Valuable Species

Frequently, the denuded tropical forests are planted with rapid-growing trees that can be utilized in a short time for pulpwood or firewood. Plantations may be reserved for pulpwood and firewood but the more valuable Dipterocarpus trees should be planted in deforested areas for future domestic and export markets.

3.5 Employment of Youth

There are many out-of-school youths in the rural areas. Many prefer working rather than continuing with their education. Their large numbers can be employed to work in the forests by planting trees and at the same time serve as look out for illegal poachers. With thousands of unemployed youths around the country, the government can set up legions of unemployed youths to reforest the entire country.

3.6 Hiring Indigenous People

Many forest guards have not been effective in protecting the forests under their jurisdiction. Cases of illegal logging still happen throughout the country. Hiring indigenous dwellers who are stakeholders to guard the forests is the other way to solve the problem. This will give them a new livelihood instead of practicing unsustainable farming that destroy the forests. The fulltime workers as well as inspecting, can be called up to plant new trees and care for growing ones.

3.7 Tree Donation

Donation of trees is one way of increasing the demand for trees and encouraging tree planters to grow more. Whenever possible, donate a tree to a school, hospital, park, or to the city in memory of someone. Trees can also be donated to a friend who has a backyard. On the other hand, ask for a tree as a gift. It could be a very rewarding experience. It has long been a custom to send flowers for special occasions. Small trees can also do it.

Conclusion

The importance of tropical rainforests can be considered in the three aspects; namely, natural resources, environmental interrelationships and global climate connection. The main causes of tropical forest destruction include slash-and-burn agriculture, logging, cattle in the forest, rain forest roads, mining and hydroelectric projects. The reforestation strategies include 1) subsidizing reforestation 2) educating the people 3) cooperating with the NGOs 4) encouraging the campaign of reforestation to protect valuable species 5) creating the employment of youth 6) hiring indigenous people for the reforestation projects and 6) encouraging the propagation of tree donation.

Reference

Caufield, Catherine. (1985). *In The Rainforest: Report from a strange, Beautiful, Imperiled World.* New York: Alfred E. Knopf.

Collins, Mark. (1990). *editor.* The Last Rainforest. Oxford.

Judith S, Scherff. (1991). *The Mother Earth Hand Book.* New York: The Continuum Publishing Co.

Myers, Norman. (1984). *The Primary Source: Tropical Forests and Our Future*. New York: W.W.Norton and Co.

Secrett, Charles. (1984). *Rainforest: Protecting The Planet's Richest Resource*. London: Russell Press, Ltd.