

The Rain Forest: One Hundred Acres a Minute?

Around the globe at the equator lies a hot, humid, tropical belt of land, much of it covered by canopies of leafy trees. The understory teems with rich vegetation, exotic birds, a myriad of small mammals, and a multitude of insects. This is the rain forest. And just about every schoolchild learns that it is in danger.

- ◆ *Science Is . . .*, a teacher's resource guide, declares that "we lose 100 acres [40.5 hectares] of rainforest per minute. That's fast enough to destroy all the world's rainforests in just a few decades."¹
- ◆ "Every year 250,000,000 (250 million) acres (101,171,400 ha) of tropical rainforest are cut down," says the *Kids' Ecology Book*. "That's almost 250 million city blocks or the size of England."²
- ◆ *Science Directions 9* writes about the "tropical forests, which are being cut and burned at an alarming rate."³

- ◆ “Deforestation is happening at such a rate that some people predict that the rainforests will vanish by early in the next century,” reads *Journeys in Science*.⁴

It isn't just that forests are being converted to cropland, these books say. The soil is soon exhausted since its nutrients have been absorbed by the trees and other vegetation. “Thus, within a few years, land once covered by awe-inspiring forest is reduced to useless wasteland,” sums up Prentice Hall's *World Geography*.⁵ North Americans are partly responsible for this devastation, the books say.

- ◆ Cattle ranches are replacing the rain forest, says *Looking at the Environment*, by David Suzuki and Barbara Hehner. “Almost all the beef raised on this [former rain forest] land ends up as hamburgers in North American fast-food restaurants.”⁶
- ◆ A geography text prints under a photograph of a woman eating a hamburger, : “Some environmentalists claim that in taking a bite from a hamburger, you might also be taking a bite from a rainforest. What is the link between hamburgers and rainforests?”⁷

The fact is, however, that Canada imports less beef from rainforest countries than we export to them.⁸ Our fast-food restaurants are supplied predominantly by Canadian ranchers. Our consumption of hamburgers in Canada is having very little impact on the state of the Brazilian rainforests.

A More Objective Look

Deforestation usually refers to the complete conversion of forest to cropland or other uses. Sometimes the wood from the forest is logged; at other times, trees are burned to clear the land. Deforestation is a

legitimate concern but the problem should be viewed objectively, not sensationally. Although there are differences of opinion as to the severity of the problem, and arguments that the extent of deforestation is exaggerated, most textbooks only tell the scary part of the story.

Some conversion of the rain forest is not a bad thing. As we saw in Chapter 8, Canada has experienced extensive forest clearing, beginning around the middle of the nineteenth century. Many prominent people, including timber magnate H.R. Macmillan, feared a “timber crisis.”⁹ They thought that the nation would run out of wood. But the label “timber crisis” is an exaggeration. As prices rose, demand for wood declined, and timber substitutes were developed. In addition, public and private efforts combined to encourage better forest management. Canadian forests today are healthy.

“It is clear,” say resource economists Roger A. Sedjo and Marion Clawson, “that dynamic growing societies will generate pressures on and changes in the forest resource base.”¹⁰ The widespread clearing of tropical forests is likely to be temporary.

The textbooks are somewhat misleading about the estimates of rain forest clearing. Sedjo and Clawson, relying on numbers provided by the Food and Agriculture Organization of the United Nations, report that during the 1980s about 59,459 square miles (153,998 square kilometres) of forest were cleared per year.¹¹ This is about 0.8 percent of the tropical forest, and is in line with the textbook estimates.

But these figures include *all types* of forests and vegetation in tropical areas, not just tropical rain forests. Children aren’t told that tropical areas have six vegetation zones: tropical rain forests, moist deciduous forests, dry deciduous forests, very dry forests, desert zones, and hill and low-mountain zones.¹² Tropical rain forests are less than half the total forest in every area except Asia.

- ◆ So when books claim that “100 acres a minute” (40.5 hectares) of rain forests are being destroyed, the actual figure is more like 21 acres (8.5 hectares) a minute.

- ◆ When they say that rain forests the size of England are being destroyed every year, the actual area is about one-sixteenth of the size of England.

Texts also mislead students by an almost complete failure to discuss the planting of new trees. In Asia, 10 percent of the total forest area is in forest plantations, and one acre of trees is planted for every two that are cut.¹³ In Latin America, even though tree plantations represent less than 1 percent of total forest area, about one third of Latin America's output of wood for industrial use comes from them.¹⁴ The table below gives a more complete picture.

What Causes Deforestation?

The books identify many causes for deforestation. The *Canadian Junior Green Guide* cites "four main reasons": commercial logging, cattle ranching, hydroelectric dams, and subsistence agriculture.¹⁵ Others emphasize overpopulation and poverty, especially in Brazil,¹⁶ and, as we have seen, overconsumption, especially of beef, by the developed world.

It seems to be easier to blame the Western world than to concede that the governments of some countries are bringing the problems on themselves. Yet Robert Repetto, an analyst with the World Resources Institute, an environmental think tank, points out a number of policies that are contributing to deforestation:¹⁷

- ◆ In Malaysia, the Philippines, and the Brazilian Amazon, sometimes the only way to obtain ownership of land is to clear it and cultivate it.¹⁸
- ◆ In Indonesia, the government gave companies generous tax concessions to encourage logging.¹⁹

Data on the World's Tropical Forests

	Tropical Forests ¹		Rain Forests			Tree Planting ¹	
	Percent of land area covered	Annual deforestation (percent)	Percent of total tropical forest	Annual deforestation (percent)	Ratio total tropical forest / deforestation ²	Percent of total tropical forest	Ratio deforestation / tree planting ³
Africa	24	0.7	16	0.54	184 / 1	0.57	32 / 1
Asia & Pacific	35	1.2	57	1.2	82 / 1	10.0	2 / 1
Latin America & Caribbean	56	0.8	49	0.42	234 / 1	0.94	12 / 1
Total	37	0.8	41	0.63	158 / 1	2.5	6 / 1
Source: United Nations, <i>Forest Resources Assessment 1990, Tropical Countries #112</i> , Food and Agriculture Organisation of the United Nations: tables 3, 4, 7, 8.							

1 Includes all types of tropical forest: tropical rain forests, moist deciduous forests, dry deciduous forests, and very dry forests.

2 For example, in Africa, for every 184 hectares of total tropical forest, one hectare of rain forest was cut.

3 For example, in Africa, for every 32 hectares of tropical forest cut, one hectare was planted.

- ◆ Often “migration to forested regions has been seen as a means of relieving overcrowding and landlessness in settled agricultural regions . . .”²⁰

In 1989, Dennis J. Mahar, an economic advisor for the World Bank, reported on policies of the Brazilian government that encouraged deforestation.²¹

- ◆ Beginning in the 1960s, the government took major steps to open up the Amazon region to keep out immigrants from neighboring Peru and Venezuela.²²
- ◆ The government started massive road-building programs (with the help of the World Bank).
- ◆ It subsidized settlers who would clear land for agriculture.²³
- ◆ It subsidized loans for farming and created special tax breaks for cattle-raising.²⁴ (In spite of these extensive tax credits, few of the cattle ranches are actually profitable, says Mahar; John O. Browder of Tulane University says that without government subsidies, “producing rain forest beef would be a financial impossibility.”)²⁵

Such policies far outweigh the impact of Canadians eating hamburgers or using too much wood.

Some Good News

Some positive developments have occurred that should make children feel better about the future of rain forests around the world. They include:

- ◆ Timber volume in the temperate climates is increasing rapidly, including in Canada and the former Soviet Union.²⁶ In Canada and in the United States, more timber is grown each year than is cut.²⁷ The world is not running out of wood or trees.
- ◆ Wood production in Latin America is undergoing a major transition, say Sedjo and Clawson. Trees are being grown as crops in tree farms or plantations, where trees that are cut are continually replaced by new plantings.²⁸
- ◆ Detrimental policies of governments and the World Bank are beginning to change, and private conservation organizations around the world are taking action to protect the rain forest. For example, they have worked with the governments of countries that have rain forests to create “debt-for-nature” swaps.

“Debt-For-Nature” Swaps

“Debt-for-nature” swaps are ways that private individuals around the world can help protect the rain forest or other areas of environmental concern. They emerged some years ago to give governments an incentive to protect resources.

Many countries in the tropics engaged in heavy borrowing, especially during the 1970s, and are having trouble paying back these debts. Private environmental organizations like the Nature Conservancy and the World Wildlife Fund raise funds and then offer to pay a portion of a country’s debts to other governments or banks.

If they pay off a bond owed by the government, for example, they receive in return the right to the interest that the government pays on the bond. This interest can be used to protect an environmental resource. Twenty-one debt-for-nature swaps had been made by the end of 1991, most of them in Costa Rica and Ecuador.

No one knows how significant swaps will be. Economists Robert T. Deacon and Paul Murphy point out that they represent a small amount of money (about \$100 million) compared to the total debt of these countries. Also, there is no way to make governments carry out their part of the agreement if they don't wish to. But such swaps do provide an avenue for protection of the rain forest that wasn't there before.²⁹ One swap between the World Wildlife Fund and Ecuador created a conservation fund that was twice as large as the government's budget for parks.³⁰

In the years ahead, we may see other innovative ideas as concerned people around the world offer funds for protection of special places. If preserving the rain forest is important to people in the rest of the world, it seems fair for them to help do it.

“Lungs of the Earth”?

When forests are cleared by burning, the fires release huge quantities of carbon dioxide into the air. The books claim that this will increase global warming. And once the trees are cut down, they can no longer produce oxygen and absorb carbon dioxide through photosynthesis.

- ◆ *The Kids' Environment Book: What's Awry and Why* states that between 1 billion and 2.5 billion tons of carbon dioxide are added to the air every year as a result of deforestation. This is between one-fourth and one-half of all carbon dioxide released annually worldwide.³¹
- ◆ The Scott Foresman text *History and Life* says that the rain forests “currently produce about 40 percent of all the oxygen that we breathe.” If they are destroyed, carbon dioxide will build up in the atmosphere.³²

- ◆ The text *Journeys in Science* says that the clearing of the rainforests “may cause the amount of oxygen being released into the air to decrease.”³³
- ◆ *Take Action*, a children’s book endorsed by the World Wildlife Fund, writes: “A South American tribal legend speaks true: ‘The tropical rainforest supports the sky. Cut down the trees and disaster follows!’”³⁴

It is true that burning trees adds carbon dioxide to the atmosphere. Burning releases carbon from the trees, which then combines with oxygen to form carbon dioxide. In 1989 Richard A. Houghton and George M. Woodwell estimated that deforestation could add between 0.4 and 2.5 billion tons of carbon each year (in the form of carbon dioxide) to the air. But these are guesses with a wide range of uncertainty, and they pale in comparison to the 100 billion tons that Houghton and Woodwell say are emitted by plants and soil through a process called respiration.³⁵

Calling rain forests the “lungs of the earth,” or saying that the rain forests produce 40 percent of the world’s oxygen, implies that clearing the forests will affect our ability to breathe. And children take this message literally. Children have been known to make gasping sounds when they see paper littering the road—they have the idea that paper, which comes from trees, is taking oxygen out of the air.

Trees do contribute oxygen to the atmosphere through photosynthesis, but their contribution represents only a small part of the total amount of oxygen in the air. (Oxygen represents slightly more than 20 percent of our atmosphere.)

And while burning does add carbon dioxide, logging itself does not. (Some carbon dioxide is released from the soil after logging, however.) When trees are made into wood and used for construction of houses, their carbon is retained as long as the logs remain. The textbooks do not make this point.

Species: Extinct before They Are Counted?

Children are told that thousands of plant and animal species will become extinct due to the loss of the rain forests.

- ◆ “Thousands of species which humans have never even named have already vanished from the face of the earth,” writes *Investigating Terrestrial Ecosystems*. “And dozens more join them every day. More species live in the tropics than in all the other biomes combined.”³⁶
- ◆ “Scientists estimate that no fewer than one out of every two species on our planet dwells in the rain forest,” says Prentice Hall’s *World Geography*. “Many of these species have yet to be discovered. It is also estimated that one species of plant or animal life becomes extinct every day due to the cutting and burning.”³⁷
- ◆ The World Wildlife Fund’s *Take Action* predicts that “there will be no undamaged rainforests by the year 2070. Long before then, 60,000 plant species and more than a million animal species may become extinct.”³⁸
- ◆ Life-saving medicines will be lost. Linda Schwartz’s book *Earth Book for Kids* says that the rain forests have plants that are used in 25 percent of all drugs and 70 percent of drugs used in cancer treatments.³⁹

It is true that many medicines, perhaps one-fourth of all prescription drugs,⁴⁰ are derived from rain forest plants. But once the drugs have been identified, they can usually be made synthetically. It is possible, however, that some important genetic material could be lost if species disappear with the rain forest. Some steps are being taken to protect these resources. Drug companies recognize that the tropics may contain the raw material for future drugs.

In 1991, Merck & Co. arranged to pay \$1 million to the Instituto Nacional de Biodiversidad (INBio), a conservation and science group in Costa Rica that is trying to identify and catalog the country's plants, insects, and microorganisms. In return, Merck received exclusive rights to review samples from INBio for possible commercial applications for two years.⁴¹

In spite of many claims, no one actually knows how many species are being lost in the rain forests or elsewhere in the world. This complicated issue is the subject of Chapter 11.

Talking to Your Children

You are now ready to talk with your children about the rain forest. You will find it easier now to answer some of their questions.

- ◆ Will the rain forest disappear?

No, although it will probably get smaller for awhile. Some tropical countries are experiencing what Canada experienced about one hundred years ago—widespread logging and conversion of forest to other uses. But that was a temporary phase for us, and it should be temporary for the rain forest, too.

- ◆ Are Canadians exploiting the rain forest by eating too much meat?

No. Canada imports less beef from Brazil than we export to it. Cattle can be raised in many different places, not just a former rain forest. Many cattle ranches in Brazil were created largely through government subsidies. These subsidies have more impact on deforestation than whether people eat hamburger or not.

- ◆ Is deforestation destroying the oxygen we need for breathing?

No. Vegetation produces oxygen through photosynthesis but its contribution is a small part of the total oxygen in the atmosphere.

- ◆ Does deforestation contribute to global warming?

Deforestation by burning does contribute some carbon dioxide to the atmosphere, and some people think the increases in carbon dioxide are causing warmer temperatures. No one knows how much carbon dioxide deforestation adds, however, and we're not sure that increases in carbon dioxide will cause significant global warming. (We'll discuss that in Chapter 13).

Activities for Parents and Children

Here are some activities and discussions that you might like to share with your children.

What Maps Can Tell Us

The maps in the figure on page 126 can reduce your children's fears about the loss of the rain forest. The round shape of the world causes maps based on some projections of the globe to convey an inaccurate impression of size so that areas near the equator sometimes look smaller than areas near the poles that are, in fact, about the same size. We have superimposed a map of Canada on a map of Brazil drawn to the same scale. This should help children envision just how big Brazil is. Destruction of the rain forest is a serious concern but your children should have an accurate view of this problem.

Living in a Poor Country

The textbooks sometimes cite subsistence farming or "slash-and-burn" agriculture as a cause of deforestation. But they don't really explain why such agriculture causes deforestation.

Size of Brazil Relative to Canada



Ask your children to imagine that the family lives in a country where the only way to obtain farmland is to clear it. The family clears a section of forest by cutting and then burning it. The fires put the nutrients that were in the trees back into the soil, which helps crops to grow. After a few years, some of the major nutrients are used up. It would be possible to restore some nutrients through the use of fertilizer and modern farming techniques⁴² but the family could travel a few kilometres to another area and clear that land. Which will they do?

It may be easier to move away and clear more land than to nurture the soil in land that has already been cleared. In some places, lack of private ownership contributes to deforestation. If no one owns the land, no one will take care to replenish the soil.

Visit a Hardwood Lumber Yard

Most cities have lumber yards that specialize in hardwoods such as oak, mahogany, and teak. These woods are valued for their strength, durability or beauty, and are used for furniture and decoration. Some of these woods come from the rain forest.

Take your children to such a lumber yard and ask the owner or manager to show your children the different kinds of wood and tell them where they come from. If they come from Latin America or Asia, ask the manager to explain why the wood comes from so far away. Is the manager concerned that deforestation may lead to the disappearance of the wood? The manager may allay fears that too much wood is coming from the rain forest.

Notes

- 1 Susan V. Bosak, *Science Is . . .* Second Edition (Co-published by Richmond Hill, ON/Markham, ON: Scholastic Canada/ The Communication Project, 1991), 358.
- 2 Roma Dehr and Ronald M. Bazar, *Kids Ecology Book: Good Planets Are Very Hard to Find!* (Vancouver: Earth Beat, 1991), 45.
- 3 Douglas A. Roberts, *Science Directions 9* (Edmonton: Arnold, 1991), 265.
- 4 Larry D. Yore, Peter Beugger, *et al.*, *Journeys in Science 7* (Toronto: Collier Macmillan Canada, Canadian ed., 1990), 226.
- 5 Thomas J. Baerwald and Celeste Fraser, *World Geography* (Needham, MA: Prentice Hall, 1993), 250.

- 6 David Suzuki and Barbara Hehner, *Looking at the Environment* (Toronto: Stoddart, 1989), 68.
- 7 Stewart Dunlop, *Towards Tomorrow: Canada in a Changing World—Geography* (Toronto: Harcourt Brace Jovanovich Canada, 1987), 12.
- 8 Statistics Canada.
- 9 Ian Mahood and Ken Drushka, *Three Men and a Forester* (Madeira Park, BC: Harbour, 1990), 153–170.
- 10 Roger A. Sedjo and Marion Clawson, “Global Forests Revisited,” in *The State of Humanity*, ed. by Julian Simon (Cambridge, MA: Blackwell, 1995), 332.
- 11 Sedjo and Clawson, 329.
- 12 See Food and Agriculture Organization of the United Nations, *Forest Resources Assessment 1990, Tropical Countries #112*, Tables 3, 4, 7, 8.
- 13 Food and Agriculture Organization of the United Nations, Tables 3, 4, 7, 8.
- 14 Sedjo and Clawson, 334.
- 15 Teri Degler and Pollution Probe, *The Canadian Junior Green Guide* (Toronto: McClelland and Stewart, 1990), 45.
- 16 See Baerwald and Fraser, 250-1, and Melvin Schwartz and John O’Conner, *Exploring a Changing World* (Englewood Cliffs, NJ: Globe, 1993), 243.
- 17 Robert Repetto, *The Forest for the Trees? Government Policies and the Misuse of Forest Resources* (Washington, DC: World Resources Institute, 1988), 1.
- 18 Repetto, 13.
- 19 Repetto, 16.
- 20 Repetto, 16.
- 21 Dennis J. Mahar, *Government Policies and Deforestation in Brazil’s Amazon Region*, (Washington, DC: World Bank, 1989), 9.
- 22 Mahar, 11.
- 23 Mahar, 37.

- 24 Mahar, 13–20.
- 25 John O. Browder, “The Social Costs of Rain Forest Destruction,” *Interciencia*, Vol. 13, No. 3, May/June 1988, 115–120 at 118.
- 26 Sedjo and Clawson, 333.
- 27 Evergreen Foundation, *The Truth About America’s Forests*, Special Bonus Issue (Washington D.C.: Island, 1991), 4.
- 28 Sedjo and Clawson, 334.
- 29 Robert T. Deacon and Paul Murphy, “Swapping Debts for Nature: Direct International Trade in Environmental Services,” in *NAFTA and the Environment*, ed. by Terry L. Anderson (San Francisco: Pacific Research Institute, 1993), 69–90.
- 30 Deacon and Murphy, 77.
- 31 Anne Pederson, *The Kid’s Environment Book: What’s Awry and Why*. (Santa Fe: John Muir, 1991), 71–8.
- 32 T. Walter Wallbark, et al., *History and Life* (Glenview, IL: Scott Foresman, updated ed., 1993), 766.
- 33 Yore and Beugger, et al., 346.
- 34 Ann Love and Jane Drake, *Take Action* (Toronto: Kids Can, 1992), 75.
- 35 Richard A. Houghton and George M. Woodwell, “Global Climatic Change,” *Scientific American*, Vol. 260, No. 4, April 1989, 36–44.
- 36 William A. Andrews and Donna K. Moore. *Investigating Terrestrial Ecosystems* (Scarborough: Prentice-Hall, 1986), 285.
- 37 Thomas J. Baerwald and Celeste Fraser, *World Geography* (Needham, MA: Prentice Hall, 1993), 250.
- 38 Love and Drake, 71.
- 39 Linda Schwartz, *Earth Book for Kids: Activities to Help Heal the Environment* (Santa Barbara, CA: Learning Works, 1990), 114.
- 40 Deacon and Murphy, 73.
- 41 Deacon and Murphy, 74.
- 42 Roger A. Sedjo and Marion Clawson, “Global Forests,” in *The Resourceful Earth*, ed. by Julian Simon and Herman Kahn (New York: Basil Blackwell, 1984), 151.