Razing of rain forests upsets world climate

The transnational corporations are burning the Amazon rain forest. Results: vast pollution, dramatic changes in water-vapor levels and temperatures, and drought. Rogelio Maduro reports.

This is the first in a series of EIR *reports in preparation, which will deal with various aspects of the present, aberrant weather patterns worldwide. What this first report should make clear to the reader, is the nature of the fraud being perpetrated by the coterie of malthusians who argue that the drought is a by-product of industrial development. We are hearing a great deal about the supposed "greenhouse effect" lately, which, it is claimed, is caused by industrial emissions mainly of carbon by-products. What is not mentioned is the fact that an amount vastly greater than all the industrial pollution of the atmosphere by the United States, is released by the wanton burning of the Brazilian rain forest. The full consequences of the ongoing destruction of our rain forests are as yet incalculable.*

On August 24, 1987, the NOAA-9 meteorological satellite flew its usual course over the Brazilian Amazon, a routine overflight, except that this day and for the next several weeks, its data was being monitored for the first time to detect large burnings of biomass in the Amazon. The picture was rather frightening: 8,000 square kilometers (3,089 square miles) of land were on fire from 6,800 separate fires, none less than a square kilometer and several over 10 square kilometers in dimension. These were not accidental fires. They were set by man.

At the end of the satellite study, led by Brazilian scientist Alberto W. Setzer of the Institute for Space Studies in São Paulo, it was conservatively estimated, based on the satellite images and corroborated by overflight and on-site inspection, that over 20 million hectares (200,000 square kilometers, or 77,220 square miles) of land were burned down in 1987 in the Amazon Basin alone (see **Map 1**). Of this, at least 40% corresponded to virgin forest.

As can be seen in **Table 1,** the satellite pictures revealed that that approximately 4.4% of the land area of the Amazon Basin was burned down last year; at the state level, the percentage of area burned in relation to the area of the state varied from 18.7% in Rondonia to 0.1% in Amazonas.

To get an idea of the enormous land area that went up in smoke in Brazil last year, it is almost as large as West Germany, and larger than most states of the United States, about equivalent in size to Virginia and West Virginia put together. The shaded area of Map 1 corresponds to the Amazon Basin, the only area of Brazil surveyed under the satellite study. Bordering Brazil to the north are Guyana and Surinam. The total area of devastation is larger than either of those nations.

The burnings in the Amazon Basin produced dense smoke clouds over areas of 1.5 million square kilometers. "The smoke from the fires is thick enough to close down large and small airports for weeks, and it certainly increases the number of cases of respiratory illness in the area, but there are no official statistics," says Dr. Setzer.

Utilizing standard equations to calculate areas of damage due to nuclear explosives, it can be estimated that at least 650 one-megaton hydrogen bombs, such as those carried in Soviet intermediate range ballistic missiles, would have been required to wreak similar devastation to over 200,000 square kilometers of Amazon jungle. A one-megaton H-bomb will destroy everything in a radius of approximately 10 kilometers from the point of impact, depending on the topography and altitude at which the bomb detonates. The main difference between burning large areas of rain forest at once and a thermonuclear strike, is that an H-bomb would lift a somewhat larger amount of debris higher up into the atmosphere, and of course, leave a large amount of radioactivity behind. On-site observers remark that after a firestorm, the burnt

MAP 1

Amazon Basin area covered by satellite study

(Percent of area burned shown in parentheses)

Shaded area represents the Amazon Basin, the area of Brazil that was under real time observation by the NOAA-9 meteorological satellite. The percentages of landcover area of individual states observed under fire last year by the satellite are in parentheses. For comparison, the total area of land burned in the Amazonas last year is larger than the total area of either Surinam or Guyana, just to the north of Brazil.

Amazon forest looks just like Hiroshima or Nagasaki.

The preceding facts have barely received notice in the press, despite the fact that one of the most severe droughts in history has just devastated food production in the U.S. grain belt. Weather anomalies, from severe drought to flooding, have been multiplying throughout the world in the past few years.

What actual phenomenon in the biosphere has caused these disturbances in the climate is a subject of great debate in the scientific community. However, if one surveys the rain forests of the world, the picture is one of ecological holocaust whose global implications are to be dreaded. **Table 2** summarizes the results of the only systematic study done to date on global deforestation. Based on Landsat pictures, the data indicates that the world's rain forests were being deforested at a rate of 11.3 million hectares a year in 1981. That rate has increased exponentially. The NOAA-9 satellite observations revealed that in Brazil, no less than 20 million hectares of land were deforested last year, just in the Amazon, nearly twice the total amount deforested in the entire world in 1981.

TABLE 1
Estimated areas burned in Brazil's Amazonian Basin, 1987

State	Area burnt (km²)	% of state area
Rondonia	45,452	18.7
Mato Grosso	78,718	8.9
Goias	38,910	6.1
Acre	7,274	4.8
Maranhao	13,766	4.2
Para	19,365	1.6
Amazonas	1,093	0.1
Total	**204,608**	**4.4**

Source: Alberto Setzer, Relatorio de Atividades do Projecto IBDF-INPE "SEQE"-Ano 1987

Every year, about 6 million hectares of land are irretrievably lost to desertification, and a further 21 million hectares are so degraded that crop production becomes uneconomical. About 3,500 million hectares of land—an area the size of North and South America combined—are affected by desertification, while the rural population affected by serious desertification rose from 57 million people in 1977 to 135 million people in 1984.

The 'greenhouse' myth

While this real catastrophe is staring at humanity, the Western news media have been filled with scare stories about the so-called "greenhouse effect." The Earth is supposed to warm up several degrees, the polar icecaps melt and submerge a large portion of the Earth's cities, while other major changes ocurr in local climates. The drought that has wiped out a large portion of this year's food production in the United States has been blamed on the "greenhouse effect."

TABLE 2
Annual rates of deforestation (1980)
(thousand hectares)

	Annual rates of deforestation Tree formations		
Region	**Closed**	**Open**	**All**
Tropical America (23 countries)	4,339	1,272	5,611
Tropical Africa (37 countries)	1,331	2,345	3,676
Tropical Asia (16 countries)	1,826	190	2,016
Total (76 countries)	**7,496**	**3,807**	**11,303**

Source: Jean Paul Lanley, "Tropical Forest Resources," U.N. Food and Agriculture Organization, Forestry Paper 30, Rome: FAO, 1982.

The scientific basis behind the "greenhouse theory" is rather flimsy, but that is not what is important. What is important is what the proponents of the theory, the news media, and supranational institutions are covering up: the massive, wholesale destruction of the world's rain forest; the rapid increase of global desertification; and the outbreak of pandemic diseases and plagues throughout devastated areas of the underdeveloped sector. Largely as a result of this, and not any so-called "greenhouse effect," major anomalies in weather patterns such as this year's drought, are occurring throughout the world, posing serious threats to the world's food supplies and long-term survival of the human race as a whole.

Supporters of the greenhouse theory, including many members of the U.S. Congress, are marshaling forces to implement draconian measures throughout the world that will "save humanity from the greenhouse effect." This includes a 50% cutback in the consumption of fossil fuels, extensive measures to control population growth, severe restriction on industrial activities, and ultimately, the creation of a one-world fascist government that will control and "preserve" all natural resources.

An economic policy

It is the policies of "appropriate technologies" and IMF and World Bank-dictated "conditionalities" that are directly responsible for the present rates of deforestation and desertification. U.S. presidential candidate Lyndon LaRouche warned recently:

"It must be emphasized that the deforestation of the Amazon region was a direct result of OECD nations' Brazil policies of the 1960s and 1970s. Not only the notorious Professor Milton Friedman, but also leading social-democratic ideologues among Keynesian economists, such as the late Professor Abba Lerner, proposed that forms of austerity modeled upon those of Germany's Hjalmar Schacht, be imposed upon Brazil, as also upon Chile and other nations. In the case of Brazil, such policy-recommendations were dictated as international financiers' 'conditionalities,' as an alternative to Brazil's nuclear energy program, in particular, and to Brazil's big infrastructural projects program in general.

"The use of 'biomass' for fuel, as a substitute for coal, petroleum, major hydroelectric projects, and nuclear energy, was key to the process. In addition to the general waste of 'biomass' as a substitute for fuel, agricultural projects in the rain forest region were launched on a large scale—with the foreseeable result of transforming land into ruined laterite.

"The Brazil model merely exemplifies the more general result of combining the looting of primary resources, by Lombard-style usury, by the added imposition of both 'conditionalities,' and by so-called 'environmentalist' anti-technology measures, which has put most of our planet through a downward spiral of economic and ecological devolution."

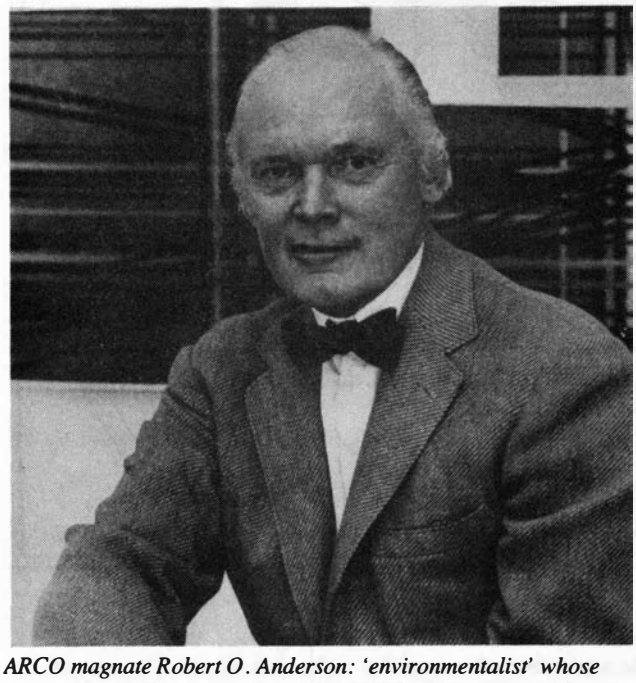
Enter the multinationals

The rate of burning of the Amazon rain forest has increased dramatically since 1985, following the opening of penetration roads into previously virgin territory, especially in the states of Rondonia and Mato Grosso. Between 1966 and 1975, 11.5 million hectares of forest were cleared, while the total amount last year alone was 20 million hectares. Despite the common misconception that most of the burning is done by peasants and Indians, during the 10 years up to 1975, 60% of the clearance was done by highway developers (3,075,000 hectares) and cattle ranchers (3,685,271 hectares), and only 17.6% by peasants.

These ratios have shifted since 1975, to the point that today transnational corporations account for almost the entire devastation.

Transnational corporations and European noble families or their "fondi," such as the Thurn und Taxis and Matarazzo families, bought most of the Amazon rain forest wholesale in the 1970s and early 1980s, when the Brazilian government sold plots larger than 2,000 hectares for $5 per hectare. The price per hectare rose to $35 in the 1980s, as the Brazilian government started running out of land to sell.

One of the few such transactions that came to public attention was Daniel K. Ludwig's billion-dollar Jari scheme near the mouth of the Amazon. Ludwig purchased 15,000 square kilometers of land (an area larger than the state of Connecticut), and then proceeded to fell and burn the rain forest in an area of 1,000 square kilometers in order to plant two different species of trees. As in all attempts at monoculture in the rain forest, the scheme failed miserably, leaving the Brazilian government with all the debts and a huge patch of desert.



ARCO magnate Robert O. Anderson: 'environmentalist' whose corporation has committed some of the greatest crimes against the world environment.

The standard operating procedure in these vast tracts of land is for the transnational corporations, two of the most guilty of which are Volkswagen and Atlantic Richfield Corporation (ARCO), to clear-fell the forest, sell the few trees worth the trouble of extracting, and burn the rest; then sow grass and bring in cattle, despite the fact that the land has proven able to sustain only about one head per 2.5 hectares on average, and that the average life of each ranch is a mere two to seven years before it has to be abandoned due to weed growth, erosion, and loss of nutrients.

ARCO, by the way, is headed by Robert O. Anderson, one of the chief funders of the world's "environmentalist" movement!

At the same time, most of Brazil's rich and productive farmland, located largely in the south, is today underused, or not cultivated at all, being held for investment by corporations and absentee landlords. In Brazil, 1% of the landholders control 43% of all farmland, while 50% of the farmers own only 3% of the farmland.

In the 1970s, the Brazilian government started an ambitious program to "settle" the Amazonia, both to quiet the clamor for land reform, and to populate the areas that the transnationals wished to exploit. Land was given free to settlers, and wave after wave of immigrants arrived, enticed by hopes of a new life on their own property. The government, however, did not provide any agricultural machinery, technologies, or infrastructure—not even hospitals, schools, or the most basic services. The settlers were thus forced to use the most primitive slash-and-burn techniques to try to eke out a bare subsistence. Most failed because of the poor soil, and many ended up as laborers on the ranches that mushroomed up. Several hundred thousand of these colonists are now "trapped" in the Amazon, suffering some of the highest mortality rates in the world due to disease and malnutrition. They work on on the ranches as virtual slaves.

Indonesian rain forests are being destroyed almost as rapidly as those in Brazil. Although no satellite study has been done of the Asian rain forest, it was estimated by Alan Grainger of Oxford University, that as of 1983, logging was cutting the rain forest at a rate of over 800,000 hectares a year, while shifting cultivators following behind cut about 200,000 hectares of mostly previously logged and damaged or secondary forest. As in Brazil, transnationals, in this case Georgia Pacific and Weyerhaeuser, are responsible for most of the deforestation.

The rain forest and global climate

The three most important tropical ecosystems in the world, which provide the vast majority of water vapor transpired from landmasses into the atmosphere, are located in the Amazon, the delta of the Zaire (Congo) River, and Indonesia.

The greatest amount of global precipitation falls on these tropical rain forests as can be seen in **Map 2.** Disastrously, these are the areas, especially the Amazonas and Indonesia, where the greatest amount of deforestation is occurring.

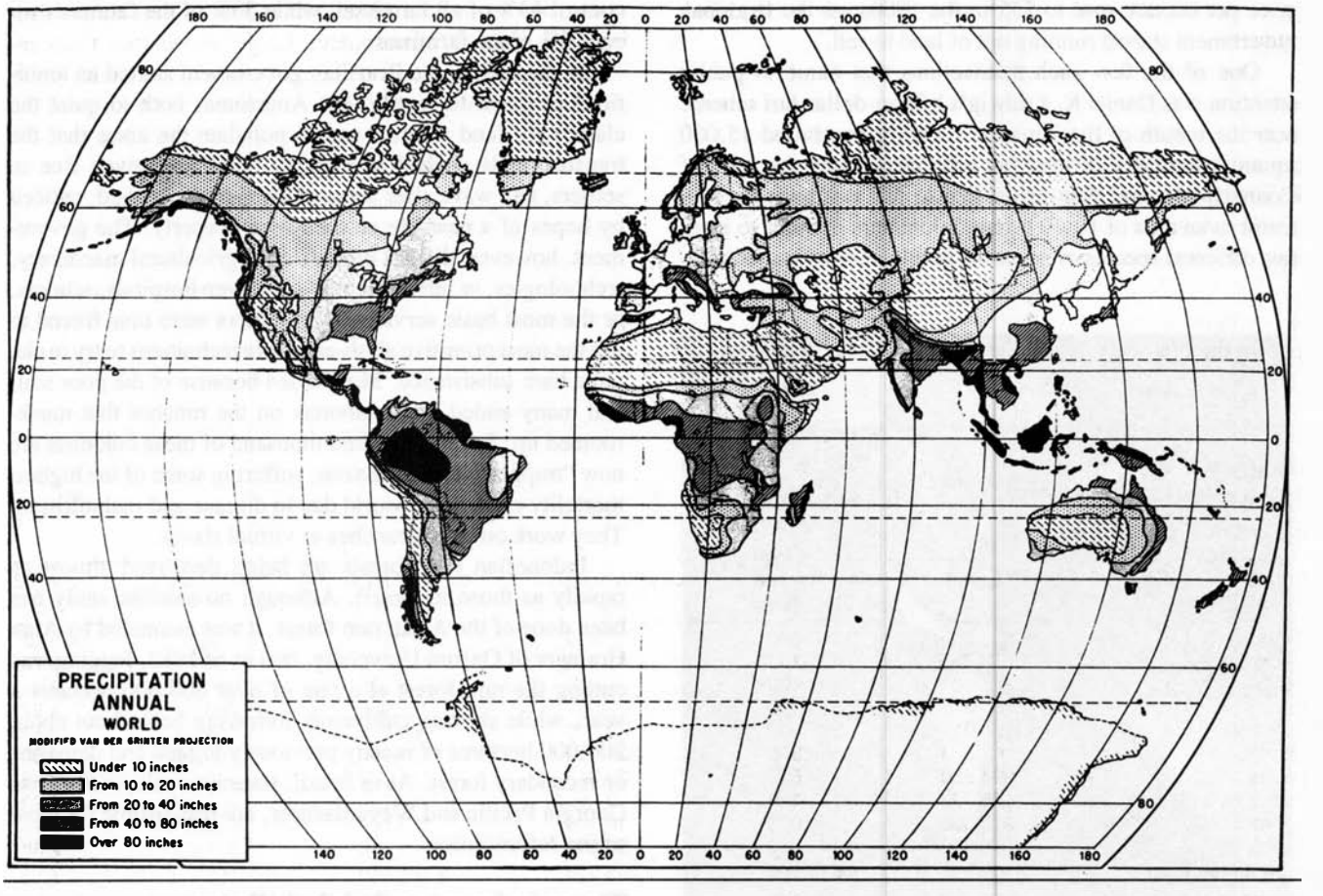
Table 3 defines these areas and the forest types considered. Notice that Brazil posseses 30.68% of all the tropical forest in the world; Peru, Colombia, Bolivia, and Venezuela 16.5%; Indonesia by itself 9.78%; while the "deforestation belt" of Asia—Burma, Indonesia, and Papua New Guinea—account for 15.36% of the world's tropical rain forest. In summary, the table shows that a mere 10 countries on the planet possess 75.62% of the world's rain forest.

The tropical rain forest functions as a solar engine, absorbing more sunshine than any other living land cover, moderating surface temperatures, and reducing heat reflection into the atmosphere. It uses this absorbed energy to combine atmospheric carbon dioxide gas to form all kinds of substances. It is the largest terrestrial net producer of oxygen. It is also the greatest source of water vapor into the atmosphere, which provides rain in other areas. As demonstrated in the now nearly extinct rain forest of Africa, deforestation creates a cycle of desertification, including a rise in temperatures as the albedo effect starts to take place, a result of cutting the green cover—and drought: Rain becomes scarcer when water vapor is no longer being returned into the atmosphere.

The complex workings of this biosphere and its relation to the atmosphere are largely unknown, but a recent joint study conducted by scientists from the United States and Brazil has provided a wealth of discoveries that are still being evaluated. The expedition, the Global Tropospheric Experiment/Amazon Boundary Layer Experiment (GTE/ABLE), was conducted above the Brazilian Amazon rain forest in

MAP 2

Annual world precipitation



Source: Clarence E. Koeppe, *Weather and Climate.*

Observe that the areas with the greatest amount of precipitation are the Amazon and Indonesia and surrounding areas. Water vapor is cleansed by the rain forest, including removal of CO_2, and recycled into the upper atmosphere together with a rich mixture of chemicals, which are then transported to other regions of the world. These rain forests are the critical "solar engines" that are being most thoroughly destroyed.

July and August 1985 and in April and May 1987. It combined, for the first time, local measurements at ground stations, regional measurements aboard aircraft, and global measurements from the Space Shuttle and satellites, to study the influence on the troposphere of the world's largest rain forest and its influence on chemistry and meteorology of the Earth's atmosphere.

In a paper summarizing the results, mission scientist Robert C. Harris of NASA's Langley Research Center asserted that the data obtained supported hypotheses that:

1) Tropical rain forest environments are characterized by relatively intense sources of biogenically-produced gases and aerosols.

2) The world's largest rain forest, in the Amazon basin, is a region of frequent atmospheric instability with intense thunderstorm activity, resulting in a potential for rapid mixing of biogenic gases and aerosols at high altitudes, where they impact global tropospheric chemistry.

3) The tropical troposphere is a region of intense photochemical activity where sinks for certain biogenic trace gases (e.g., isoprene (C_5H_8)) produce sources of gaseous products (e.g., carbon monoxide, CO) that may be significant to global budget.

One of the most important discoveries was the role of Amazonian forest soils and vegetation as sources of nitrous oxide NO and C_5H_8 to the atmospheric mixed layer, and consequently, the potential for photochemical production of O_3 (ozone) during the oxidation of C_5H_8.

The Amazon ecosystem removes ozone from the air in the forest and the air immediately overlying the forest. Concentrations of ozone are typically 40 parts per billion (ppb) in the upper atmosphere over the Amazon, decreasing to 20 ppb in the boundary layer; they go to undetectable levels at night in the forest. Thus, tropical forest ecosystems act as a filter, removing ozone from the air through reactions of hydrocarbon gases emitted by vegetation and by ozone uptake on soil and plant surfaces.

Large convective thunderstorms were observed to transport ozone from above 5 kilometers to the lower atmosphere where ozone removal occurs. Thus, the rain forest ecosystem removes ozone, a chemical poisonous to human and animal life in the forest, while it pumps ozone and basic chemicals in the formation of ozone, to the ozone layer. The destruction of the rain forest may therefore be one of the principal causes of the thinning of the ozone layer.

The ABLE-2 expedition also revealed that as air coming from the Atlantic Ocean flows over the Amazon to the Andes Mountains and exchanges of gases and aerosols (particles) occur, a series of chemical reactions are set off which eventually impact global air quality and the Earth's radiation budget.

Natural organic carbon makes up more than 80% of the aerosol mass. The chemical composition of aerosols changes as inflowing ocean air transects the Amazon Basin, and frequent rainstorms remove sea salt and mix forest aerosols up into the tropical atmosphere. Large convective thunderstorms typical of tropical regions can transport rain forest gases and aerosols to altitudes of greater than 6 kilometers, where they become integrated into the atmospheric circulation. These aerosols play important roles as cloud condensation nuclei, creating the conditions for rain to occur as water vapor is transported to other areas of the world.

Deforestation plays a critical role in destroying the climate of a region, through reduction of humidity and rates of plant evaporation and a change in the energy balance. In the Amazon forest, it has been calculated that 25.6% of precipi-

TABLE 3
The world's principal tropical forest countries by area
(square kilometers)

Country	National area	Undisturbed forest	Legal/managed forest	Unproductive forest	Total forest area	% world total
Brazil	8,511,965	2,886,300	120,000	556,500	3,562,800	30.68
Indonesia	1,903,650	389,150	346,600	400,000	1,135,750	9.78
Zaire	2,345,409	797,400	3,800	255,300	1,056,500	9.09
Peru	1,285,215	373,200	60,000	259,900	693,100	5.97
Colombia	1,138,914	386,000	9,000	69,000	464,000	3.99
India	3,166,828	48,850	334,730	76,860	460,440	3.96
Bolivia	1,098,580	177,600	120,900	141,600	440,100	3.79
Papua New Guinea	475,300	138,150	2,200	196,750	337,100	2.90
Venezuela	912,050	76,000	116,100	126,600	318,700	2.74
Burma	678,030	141,070	90,090	80,770	311,930	2.68
Cumulative total		**5,413,720**	**1,203,420**	**2,163,280**	**8,780,420**	**75.62**
And 63 other countries		1,270,430	720,350	838,550	2,829,930	24.39
World total		**6,684,150**	**1,923,770**	**3,001,830**	**11,610,350**	**100.00**

Sources: Forest types and area from *Tropical Resources Assessment Project,* Rome: FAO, 1981. Country areas from John Paxton, ed., *The Statesman's Yearbook, 1983-84,* London: Macmillan, 1985.

tation is intercepted by the vegetation and returns to the atmosphere by direct evaporation, 45.5% is transpired by plants, and 25.9% is drained through the surface run-off. Therefore, about 75% of the precipitation returns to the atmosphere in the form of water vapor through the action of plants, indicating the importance of this type of vegetation cover for the components of the Earth's water budget. (The best overview of this subject is found in *The Climatology and Hydrology of Amazonia* by Brazilian scientist Eneas Salati, from which these figures have been taken.)

Approximately 6,430 billion tons of water vapor are generated within the Amazon water basin as a whole through the direct action of plants in interception, evaporation, and transpiration. This is the same magnitude of water vapor as that coming from the ocean. There are several hypotheses as to what happens to this water vapor, but no direct studies of this have been done in the atmosphere. The best working hypothesis is that the water vapor generated by the Amazon moves toward the west, and is replaced by primary vapor generated in the Atlantic ocean. The Andean Mountains form a natural barrier 4,000 meters high and effectively prevent the exit of water vapor to the Pacific Ocean. This is the reason that the western side of the Andes on the Pacific Coast is so dry, while the eastern slope of the Andes has enormous precipitation rates.

The Andes Mountains funnel the water vapor both to the north and the south, depending on the latitude. Above the Equator, the rotation of the Earth would move the vapor northward over the Guyana Plateau and the Colombian and Venezuelan *llanos* (plains), the Amazon water vapor ending up in the Caribbean Sea, where most of the storms and hurricanes that hit the East and Gulf coasts of the United States are generated.

Below the Equator, the water vapor is driven south over the central plateau of Brazil and the lowlands of Bolivia, Paraguay, Argentina, Uruguay, and Brazil. The final destination of the Amazon water vapor is Antarctica, where it may also play a critical role in global climate.

Deforestation drastically changes this water and energy cycle. If there is less water available for evapotransportation, there will be a decrease in relative air-humidity, which will alter the energy balance. The incident solar energy, instead of being used for water evaporation, will be used for heating the air.

In addition, the change in vegetation cover involves a change in albedo—the power of light reflected on the surface under consideration. Changes in albedo also involve changes in the energy balance. Modifications of small areas surrounded by forest should not influence the energy and water balance or regional climate as a whole, but when thousands of hectares are involved, drastic local climatic changes occur, as can be witnessed in India and Africa.

Several studies have documented the role of deforestation in increasing the temperatures and sharply reducing precipitation in local areas of Africa, Asia, and the Amazon, but no large-scale studies have been done. Mr. Indra Kumar Sharma of India has written that, in India's Rajasthan region, the unreliability of the rains has increased as a direct result of deforestation, since the dry air currents rising off the hot ground dispel weak monsoonal fronts, whereas in contrast, the warm, moist air rising from vegetated areas promotes the buildup of local thunderstorms so that areas of dense vegetation receive 40% more rain than neighboring deforested areas.

It is also important to consider the effect of the variation in the quantity of vapor condensing in the higher parts of the atmosphere. During evaporation, solar energy is transformed into latent heat which is released in the highest layers of the atmosphere where the water vapor condenses to form clouds. This energy is partially responsible for the circulation of the upper atmosphere. Part of this vapor is transferred to the polar regions, and upon condensation, releases energy; this is one form of energy transfer from equatorial to polar regions.

Dr. Alberto Setzer has also warned about the effects on global climate of the massive burning of the rain forest. The huge cloud of smoke and gases produced by the burning is carried south by the regular wind currents. This may be one of the major contributing factors toward the thinning of the ozone layer in the Antarctic. To West Germany's leading ozone expert, Professor Paul Crutzens, head of the Max Planck Institute at Mainz, the connection is already clear. "One of the main causes of ozone destruction is these enormous fires, not just in Brazil, but in Africa, too."

There are correlations between the forest fires and ozone depletion from the evidence gathered so far. Twelve days

TABLE 4

Regional estimate of emissions produced by burning, 1987

(million metric tons)

Substance	Burning rain forest*	Total U.S. pollutants 1986**
CO^2	518	—
CO	44.03	60.96
POC (particulate organic Carbon)	4.09	—
EC (elemental C)	1.14	—
NOx	1.09	19.23
NH^3	0.48	—
SO	0.17	21.23
K	0.17	—
TPM (total particulate matter	6.22	6.71
O^3	2.49	—
CH^4	4.66	—
CH^3Cl	0.012	—

*Source: Alberto Setzer, Relatorio de Atividades do Projecto IBDF-INPE "SEQE"-Ano 1987

**U.S. Environmental Protection Agency, *National Air Pollutant Estimates, 1940-1986*

after the peak burning detected by the NOAA-9 satellite, Aug. 24, 1987, according to doctors Rie and Stolarski writing in *Scientific American,* the internationally-backed airborne Antarctic ozone experiment recorded a dramatic fall in the ozone level. It dropped about 10% over an area of 2 million square miles.

The pollution factor

The emission of pollution from the burning of the rain forest in Brazil is almost equal to the total air pollutant emissions in the United States in one year. According to calculations made by Dr. Setzer (see **Table 4**), 6.22 million metric tons of particulate matter were dumped into the atmosphere by the burning of the Amazon rain forest last year, while the total particulate matter released by all industrial, human, and non-human activity in the United States in 1986, according to the EPA, was 6.71 million metric tons. The total amount of carbon monoxide released into the atmosphere in the United States in 1986 was 60.96 million metric tons, while that released by the burning of Amazonia was 44.03 million metric tons.

It would seem, as it did to all early explorers of the Amazon, that the soil must be very rich to grow such a lush forest. Yet, the truth is that tropical rain forests are found thriving on the poorest soils on Earth. The tropical rain forests have developed an extremely complex ecosystem that essentially captures all the nutrients necessary without recourse to the soil. A forest in temperate climates, such as the United States or Europe, is differentiated "horizontally." One walks in, and first, there are shrubs, then small trees, then tall trees; pine trees will dominate certain areas, while maple and oak trees will dominate other areas. In a rain forest, it is completely different. The differentiation is "vertical." There are five canopies of trees, each with its own specializations. The forest floor is very clean, with few leaves or rotting trunks, such as those found in temperate climate forests. Every nutrient is recycled immediately in a rain forest, before they are washed away by the rain. If a leaf falls, insects, bacteria, and fungi, which live in symbiotic relationship with the roots of the trees, will digest them immediately, and return the minerals and nutrients necessary for growth back to the canopy. In the canopy itself, there are "epiphytes," plants that capture all necessary nutrients and minerals from the surrounding air.

There are two major reasons why the areas where rain forests have been either cut or burnt down become desertified so rapidly. The first is the very poor quality of the soils under the forest canopy. The second is the volume of rain that falls—several feet a year. Once the forest cover is removed, severe erosion occurs, and whatever nutrients were above ground—such as the remains of burnt plants—or in the soil itself, are leached and washed out in a short period of time. Under primitive slash-and-burn methods, a tribe of Indians or peasants move into a spot, burn a small area, and cultivate it for two years, three at the most, before all the nutrients have been exhausted. Then, they have to move on to virgin forest. The rain forest can reclaim this small plot of land rather quickly. When the area becomes larger, however, the rain forest cannot recover.

Thus, tens of millions of hectares of Brazilian rain forest have now become desertified. Full-blown deserts, with moving sand dunes and sandstorms, have emerged in many areas of Brazil and other tropical countries where, barely 10 to 20 years ago, there was lush tropical rain forest.

Tropical forests are also being destroyed by the systematic harvesting of logs to make charcoal. Even in the case where trees are replanted to replace those cut down, the same problem exists as with slash-and-burn agriculture. The original nutrients are taken away with the trees. Thus, the seedlings seldom survive. Vast areas of tropical rain forest have been cut down to make charcoal, especially in Africa where fuelwood and charcoal represent between 60% and 90% of all the energy used in most countries.

Again, Brazil represents the most criminal case, where 5.34 million metric tons of charcoal were produced in 1986, more than one-quarter of the total production of charcoal in the world. Under orders from the IMF/World Bank, Brazil is limited in its importation of coal for steelmaking, in order to preserve its foreign reserves to pay its foreign debt. Not possessing significant coal reserves, Brazil utilizes the charcoal to turn iron ore into pig iron, despite the fact that importing much higher quality anthracite coal from the United States would be cheaper and would employ tens of thousands of miners in some of the most depressed areas of the United States.

In sum, millions of hectares of lush rain forest have been cut down and turned into wastelands, to please the wishes of international bankers.

The greenhouse theory

The greenhouse theory rests on two basic premises. First, according to studies done by the "guru" of the greenhouse theory, James Hansen of the Goddard Institute in New York, the average global surface air temperature was 0.67°C warmer in 1987 than in the 1880s. Second, levels of carbon dioxide in the atmosphere have risen from about 275 parts per million before 1850 to 345 ppm in 1985, allegedly as a result of industrialization.

According to the theory, sunlight strikes the Earth and infrared (heat) radiation is reflected back into the atmosphere where it is blocked by growing concentrations of carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons. This warms the troposhere, melting the icecaps, and raising the levels of the ocean.