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Unnatural Disasters

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U N N A T U R A L D I S A S T E R S

The severity of natural disasters set a new record in 1998, causing more than \$92 billion in damages worldwide. Can we afford to write these disasters off as “acts of God,” or is there a human culpability involved?

by Janet N. Abramovitz



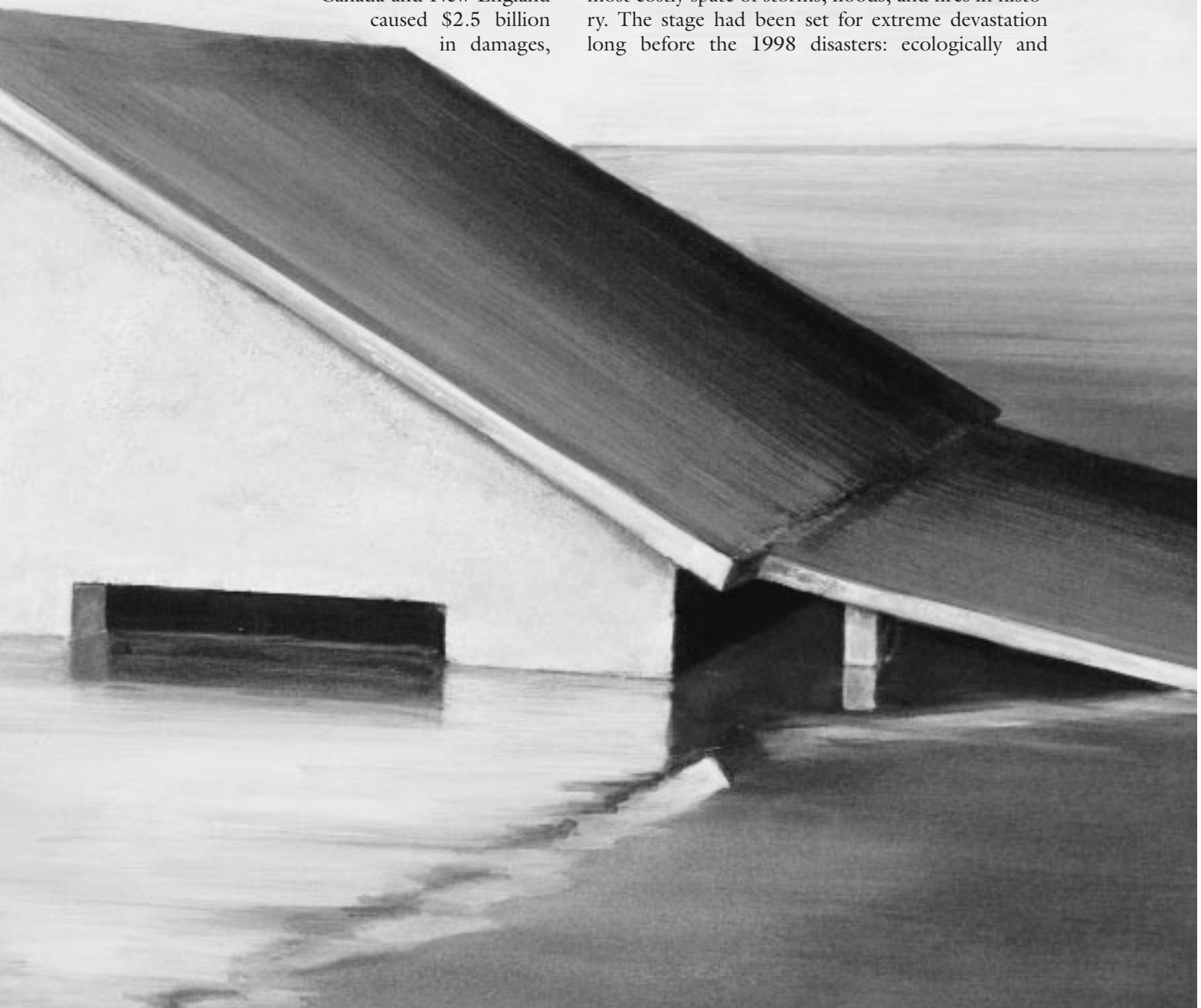
IN LATE OCTOBER 1998, Hurricane Mitch slammed into Central America, pummeling Honduras, Nicaragua, El Salvador, and Guatemala for more than a week. As the slow-moving but powerful storm hung over the region, it dumped as much as a meter of rain. By the time it turned back out to sea, Hurricane Mitch had caused around 10,000 deaths, making it the deadliest Atlantic storm in 200 years.

But Central America was not the only region to experience such devastation last year. In fact, 1998 set a new record for disasters worldwide; damage from weather-related disasters reached a record high of more than \$92 billion. Thousands of people were killed, and millions were displaced from their homes.

In January, an ice storm in Canada and New England caused \$2.5 billion in damages,

bringing down thousands of miles of power lines and nearly wiping out the region's sugar maple industry. In June, 10,000 people were killed by a cyclone in Gujarat, India. Vast forest fires raged out of control over 52,000 square kilometers in Brazil, 20,000 square kilometers in Indonesia, and 13,000 square kilometers of Siberia. Turkey, Argentina, and Paraguay experienced massive flooding. Storms, droughts, fires, and floods plagued almost every region in the world.

Ironically, the United Nations had designated the 1990s as the "International Decade for Natural Disaster Prevention," hoping to stem the rising toll taken by natural disasters worldwide. Instead, the past ten years may be known as the International Decade *of* Disasters, as the world experienced its most costly spate of storms, floods, and fires in history. The stage had been set for extreme devastation long before the 1998 disasters: ecologically and



socially, many regions were vulnerable and ill-prepared for the onslaught of storms, floods, and other calamities. Central America, for instance, has some of the highest rates of deforestation in the world—each year the region loses between 2 to 4 percent of its remaining forest cover (Honduras alone has already cleared half of its forested land). Absent much of the protective forest cover needed to stabilize this mountainous region, Hurricane Mitch washed away denuded hillsides, sweeping up homes, farms, roads, bridges, and people in massive mudslides and floods. Other pressures—poverty, population growth, and inequitable land rights—had forced more and more people into vulnerable areas such as steep hillsides and unprotected riverbanks.

That the worst devastation occurs in vulnerable places that are environmentally overstressed and economically impoverished is no coincidence. Indeed, a growing share of the devastation caused by “natural” disasters is now unnatural—stemming from ecologically destructive practices. And these human-exacerbated disasters often take their heaviest toll on those who can least afford it—the poor.

At the Hand of God or Man?

STORMS, FLOODS, DROUGHTS, AND FIRES in 1998 caused a staggering 32,000 deaths worldwide. In that year another 300 million people—more than the population of the United States—were displaced from their homes or forced to resettle because of extreme weather events. According to figures compiled by Worldwatch and the Munich Reinsurance Company, the costs of weather-related disasters in 1998 reached a record high of more than \$92 billion—a 50 percent increase over the previous record of \$61 billion in 1996. Disaster losses in 1998 alone far exceed the \$78 billion in losses for the entire decade of the 1980s (see figure at right). Munich Re estimated in its 1998 year-end report that the number of natural catastrophes has tripled since the 1960s, increasing the overall cost to the world’s economies nine-fold.

Floods, storms, and other events are certainly not new phenomena. Indeed, natural disturbances are a vital part of nature, restoring soil fertility, and shaping the landscape. The search to understand the roots of natural events like great floods has been a theme in virtually every civilization’s epic tales and creation myths. Early civilizations were closely linked to natural cycles and developed sophisticated world views that tied weather patterns and disasters to their actions. For example, in Indonesia, a sultan’s empire could rise or fall based on the portentous eruptions of the islands’ many volcanoes.

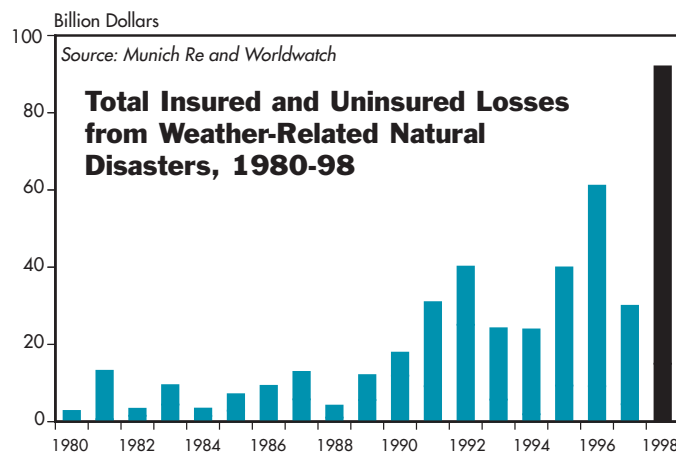
Science and technology have allowed us to more carefully document and understand disasters and

large climatological phenomena. While technological advances have often allowed us to help predict and provide early warnings about disasters, they have also given us the ability to exacerbate—and even cause—many “natural” disasters. By destroying forests, damming rivers, filling in wetlands, and destabilizing the climate, human actions are unraveling the strands of a complex ecological safety net that protects against storms and other calamities. A case in point is the costliest disaster of 1998—the flooding of China’s Yangtze River—which caused more than 4,000 deaths, dislocated 223 million people, inundated 25 million hectares of cropland, and cost well over \$36 billion.

Heavy summer rains are common in southern and central China, and flooding often ensues. But in 1998, as the floodwater continued to rise, it became clear that other factors besides unusually heavy rains were at play. Indeed, in the past few decades 85 percent of the forest cover in the Yangtze Basin had been cleared by logging and agriculture, according to a recent study by the World Resources Institute and Worldwatch. Deforestation had left many steep hillsides bare. The loss of forests, which normally intercepted rainfall and allow it to be absorbed by the soil, permitted water to rush across the land, carrying valuable topsoil with it. As the runoff raced across the denuded landscape, it caused floods.

In addition, the river’s natural flood controls had been undermined by numerous dams and levies, and a large proportion of the basin’s wetlands, which usually act as natural “sponges,” had been filled in or destroyed. All these changes reduced the capacity of the Yangtze’s watershed to absorb rain, and greatly increased the speed and severity of the resulting runoff. In Hunan province, for instance, historical records show that whereas in early centuries flooding occurred once every 20 years or so, it now occurs 9 out of 10 years.

In China, government officials initially denied that the Yangtze floods were anything but natural—



flooding was due to heavy rains caused by El Niño, they said. But as the disaster toll added up, the State Council finally recognized the human element. It banned logging in the upper Yangtze watershed, prohibited additional land reclamation projects in the river's flood plain, and earmarked \$2 billion to reforest the watershed.

Paradoxically, clearing forests also exacerbates drought in dry years by allowing the soil to dry out more quickly. Such droughts helped fuel the record-breaking fires in Indonesia and Brazil in 1997 and 1998. These massive fires occurred in tropical forests that are normally too moist to burn. But when fragmented by logging and agricultural clearing, the forests dried out to the point where deliberately set fires were able to spread quickly out of control.

The smoke and haze from Indonesia's fires choked neighboring countries, affecting about 70 million people. Schools, airports, and businesses were shut down. Crops were lost to the drought and fires, and the haze impaired the pollination of crops. The Economic and Environment Program for Southeast Asia, a research network, and the World Wide Fund for Nature conservatively estimated the economic damage to Indonesia and its neighbors at about \$4.5 billion.

Bangladesh suffered its most extensive flood of the century in the summer of 1998, when two-thirds of the country remained inundated for months. While annual floods are part of a natural cycle in this low-lying country, which encircles the meandering deltas of the Ganges and Brahmaputra Rivers, the 1998 floods reached near-record levels and did not recede for months. More than 30 million people were left temporarily homeless, 10,000 miles of roads were heavily damaged, and the annual rice harvest was reduced by 2 million tons. Overall damage estimates exceeded \$3.4 billion.

Heavy logging upriver in the Himalayas exacerbated the disaster, as did the runoff from extensive development that helped constrict the region's rivers and floodplains with silt and mud. In addition, large expanses of stabilizing mangroves had been removed from the shoreline in recent years to make way for shrimp ponds, exposing the coast to further inundation from the storms. In the future, rising sea levels caused by climate change are projected to make Bangladesh even more vulnerable to flooding.

Human-induced climate change will play an increasingly significant role in future disasters. There is strong evidence that the buildup of greenhouse gases in the atmosphere from fossil-fuel and other emissions of human industry is altering the Earth's climate. As Worldwatch researchers Chris Flavin and Seth Dunn have reported, six of the ten warmest years since on record have occurred since 1990. Rising temperatures lead to more severe storms,

floods, and droughts in many regions. And as greenhouse-gas levels continue to rise, scientists project accelerated climate change in the coming decades.

"El Niño" also played a role in the disasters of 1998. The anomalous weather phenomenon, which every few years causes a warming of Pacific waters, became a household word as a scapegoat for strange weather patterns the world over. While meteorologists have tied El Niño to some of the 1998 disasters, no previous El Niño event has resulted in such devastating consequences. Other cyclical changes observed by meteorologists, such as warmer Atlantic waters, also set the stage for more severe weather. As Colorado State University meteorologist William Gray predicted at the National Hurricane Conference in April, "The odds strongly favor us entering a new era for storms."

The Perils of Poverty

A DISPROPORTIONATE NUMBER of the world's poor live on the front line of exposure to disasters. In Nicaragua, 80 percent of those who lost their homes during Hurricane Mitch were living at or below the poverty line before the storm. Indeed, a large share of those hardest hit in the 1998 disasters were people who are already faced with such pressures as inequitable land distribution, extreme poverty, inadequate food supplies, and a rapidly expanding population. In Indonesia, the government blamed the rural poor for setting the fires that swept the country, despite satellite images tracing almost all of the blazes to corporate plantations and timber concessions.

In Central America, the nations most ravaged by Mitch—Guatemala, Honduras, and Nicaragua—have a history of highly inequitable distribution of land and wealth. Extreme poverty invites disaster. In the Honduran capitol of Tegucigalpa, one of the neighborhoods that slid into the Choluteca River was where vendors from the local market had thrown up shanties for lack of affordable housing. In the countryside, where prime agricultural land was being used mostly to produce export commodities such as bananas and coffee, subsistence farmers had been forced onto steep hillsides where they were much more vulnerable to landslides.

After the storm, half the population of Honduras had lost their homes or had been evacuated, 70 percent were without clean water, and the risk of disease and malnourishment was high. About 95 percent of the crops were destroyed in a nation where two-thirds of the workers are employed in agriculture. Many fields and villages still lie under several meters of soil, sand, and debris. Thousands of land mines, planted during a decade of civil conflict, were washed away to unknown locations. It will be years before many fields can be rehabilitated and crops can bear fruit.

Conservative estimates place the cost of damage at \$4 billion in Honduras and \$1.5 billion in Nicaragua—nearly equal to their GDPs. Government officials and relief agencies have said that the storm set back development in the region by decades.

A Patchwork Response

THE RESPONSES TO LAST YEAR'S DISASTERS are at the same time inspiring and disheartening. After Hurricane Mitch, humanitarian and government agencies from around the world acted swiftly. The housing, health care, sanitation, and transportation provided were essential to getting the region back on its feet. Worldwide, a huge number of concerned people collected clothing, food, and medicines to be shipped to the region. Unfortunately much of this effort was ineffective. In most cases, sorting and shipping the material costs more than it is worth. Six months after the disaster, most of the material collected for Nicaragua was still sitting on docks and in warehouses, waiting to be distributed.

This response to Hurricane Mitch is representative of disaster initiatives throughout the world. Instead of addressing the factors underlying disasters before they happen—systemic problems such as poverty, poor development decisions, indebtedness, deforestation, and wetlands loss—most institutional responses emphasize a patchwork effort of international relief and cleanup after the fact.

Both of those problems—the failures in prevention and the inadequate responses—were painfully evident in many of last year's disasters. In Indonesia, for example, not only did former president Suharto's government turn a blind eye to planta-

tion owners who were illegally burning forest to expand their operations, but some of the fires were set as part of the government's own misguided program to turn 1 million hectares of peat swamp into an agricultural settlement. The government provided little assistance to the millions who lost their homes and livelihoods and were sickened by the haze.

In India, the cyclone and tidal wave that hit the desert region of Gujarat and killed 10,000 people was predicted by the federal government, but the warnings were not adequately disseminated by local authorities because there was no system in place for doing so.

The Nicaraguan government has been criticized for failing to declare a state of emergency in the early days of the Hurricane Mitch. Indeed, emergency responses weren't initiated until four days into the storm, during which time the president repeatedly denied there was a crisis. Early warnings and evacuations could have saved the people in the villages around the Las Casitas volcano. After seven days of pounding rains, the side of the volcano slid away, erasing the villages of El Provinir and Rolondo Rodriguez, killing more than 2,000 people—the worst single incident of Mitch.

The huge amount of money needed for both immediate disaster relief and long-term reconstruction in Central America alone has focused attention on the growing problem of debt burden. Many have questioned how these nations can realistically be expected to provide for their citizens and rebuild while repaying their mounting foreign debt, especially since much of their capacity to generate revenue was wiped out by the storm. Before the disaster Honduras owed \$4.7 billion in external debt

Disasters in the Making

How Human Actions Amplify Nature's Disruptions

DESTRUCTION OF WETLANDS

Wetlands destruction is undermining the ability of rivers to cope with flooding because these sponge-like ecosystems help control floods by absorbing water.

CLIMATE CHANGE

Rising sea levels and a warming atmosphere—connected to the release of greenhouse gases—may be exacerbating storms by accelerating atmospheric weather patterns and allowing storms to reach further inland.



OTHERS?

Some actions may be causing unanticipated repercussions.

DEFORESTATION

Deforestation curbs the soil's ability to absorb rainfall, causing erosion and leaving thinned and fragmented forests vulnerable to flooding, droughts, and fires.

DEVELOPMENT CHOICES

Decisions to build in disaster-prone areas (flood plains, sensitive coasts, earthquake faults, etc.), whether on purpose or due to a lack of alternatives, can amplify disasters by placing more people in harm's way.

and Nicaragua owed \$5.7 billion. The daily debt service—the amount of money spent each day to pay off the debt—for just those two countries was more than \$2 million. In Nicaragua per capita GNP was only \$410, while even before Mitch, each person's share of foreign debt was three times that.

While some creditor nations have agreed to forgive all or part of the debt owed to them outright, much of the heralded post-Mitch “debt relief” involves simply postponing payments and supplying more loans (and therefore debt.) In December 1998, members of the “Paris Club” of finance ministers from creditor nations agreed that Nicaragua and Honduras could forgo debt payments until February 2001, although interest on their debts will continue to accrue. A few weeks later, the Inter-American Development Bank promised \$3 billion in new loans for reconstruction and the World Bank approved \$1 billion in 40-year interest-free loans. The International Monetary Fund (IMF) released several small loans but is withholding debt relief from Honduras unless it agrees to an “Enhanced Structural Adjustment Program” to reconfigure the country's economy.

The skepticism that met most of these creditors initiatives was summed up by the Roman Catholic Archbishop of Tegucigalpa, Oscar Andres Rodriguez: in an editorial in the *Miami Herald*, he likened the lender's moratorium on debt repayment to nothing more than a “stay of execution.” Indeed, the debt and structural adjustment programs of recent decades have forced extreme cutbacks in social services, such as health care and education, and in environmental and resource management programs—precisely the kinds of services that are needed to help prevent disasters and respond effectively when they occur. (In the past five years, Nicaragua had slashed funding to government agencies by 30 to 90 percent in an effort to meet IMF guidelines.) The new loans and structural adjustment programs will require more of the same. Brazil, also, is under heavy pressure from the IMF to reduce its budget deficit. Brazil has recently cut back on its already minimal efforts to control logging and mining in the Amazon (see *Environmental Intelligence*, page 8).

A more far-reaching initiative has been proposed under the Jubilee 2000 banner. Jubilee 2000 is a global coalition calling for the cancellation of crushing international debt by the year 2000. Endorsed by a broad spectrum of leaders, from the Pope to the president of the AFL-CIO to Nobel Laureates such as Archbishop Desmond Tutu, Jubilee is based on the biblical concept of rebalancing the scales between debtors and creditors and eliminating the slavery caused by debt. What Central America needs for reconstruction, said Archbishop Rodriguez, “is debt cancellation, combined with adequate foreign assistance and with careful oversight by our civil society.”

True Disaster Preparedness

RELIEF WORKERS—from international groups like the Red Cross/Red Crescent and Doctors Without Borders, to national and local groups—do a heroic job in their mission of providing humanitarian relief in times of natural and civil disasters. So too do many ordinary citizens. But disaster preparedness does not begin and end with humanitarian relief, and the success of these agencies does not absolve others from their responsibilities.

As the magnitude of last year's events have become clear, some policy makers are beginning to recognize the role of human activities in worsening natural disasters. After an emergency meeting of Central America's environment ministers in January, Costa Rica's vice president Isabel Odio spoke eloquently of a new awareness of the disastrous toll that deforestation has taken in Central America. Environmental degradation, Odio said, is like a war in which the ultimate victim is the human species. She likened the wrath of the hurricane to a punishment by nature for the harm done to it by humankind. In China, government officials eventually acknowledged that the Yangtze floods were greatly exacerbated by logging in the upper Yangtze watershed. In Honduras, a new law was passed after the hurricane that forbids construction in “high risk” areas. Yet if people are too poor to afford even modest rent or mortgage payments for newly constructed housing, where will they go but back to the marginal areas?

All too often, after the immediate humanitarian crisis is over, the need for disaster prevention and sustainable development—in the broadest sense—fades from the public consciousness. For example, the U.S. Congress quickly approved \$12 billion to bolster the bombing campaign in Yugoslavia, while the \$1 billion aid package that had been promised for relief in hurricane-ravaged Central America languished for months. And unfortunately, in many places development continues apace in vulnerable areas—from the huge Tehri dam in the earthquake-prone Himalayas to luxury homes on fragile coasts—often with government approval or subsidies.

The events of 1998 provided a lesson to all humanity: that any form of development which ignores ecological reality and social inequity is a prescription for disaster. Unless nations are able to build or rebuild along a path of sustainable development that emphasizes maintaining and restoring healthy ecosystems, they risk even greater exposure to the devastation of unnatural disasters in the future.

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