AMAZONIA: IN DEFENSE OF BRAZIL'S SOVEREIGNTY

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Introduction

It is easy for Americans to criticize Brazil's record on the environment, since they already live in a rich, industrialized country. But the US achieved this status largely by doing just what Brazil is condemned for: ruthlessly exploiting natural resources—including cutting down most of its native forests. Even more galling, the US continues to be a major degrader of the planet.

Had this statement been made by a radical environmentalist—especially a Brazilian—it would not cause much astonishment. But its true source is the September 18, 1989 issue of the American magazine *Time*.

Like the author, most Brazilians understand that no argument justifies the destruction of Amazonia's natural resources. They also realize, however, that behind the excessive pressures to maintain it intact are motives other than the concern for the "well-being of humanity." The Brazilian position, therefore, calls for the rational utilization of these resources in a process of sustainable economic and ecological development. Such development, in turn, would proceed according to the needs and capabilities of the sovereign states to which Amazonia's riches belong.

Brazilian worries in this respect are directed toward an attempt on the part of the developed countries to impose what might be called an "international ecological order." In such an order, multilateral financial institutions might resort to imposing excessive conditions for the approval of credit, and foreign parliaments may even legislate on matters of Brazil's exclusive competence or create supranational jurisdiction on environmental matters (as evidenced by a proposal to create an "authority" to combat any additional warming of the earth's atmosphere during an international meeting in The Hague).

As Brazil's ambassador to the Organization of American States (OAS), Mr. Bernardo Pericas Neto, recently stated, the developed countries' attitude reveals a certain intent of

... thrusting on the Third World the blame for the ecological crisis. [It] completely ignores the fact that developed countries are primarily responsible for the damages caused to nature not only in a historical perspective but also at the present moment. This is

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true not only with respect to the irresponsible maintenance of nuclear arsenals—capable of producing the most perverse of ecological tragedies—but also with respect to the serious problems of atmospheric overheating ("the greenhouse effect"), the destruction of the ozone layer and to acid rain, whose known causes are related to activities which are undertaken—more than 90% of them—by the developed world.

THE RESOURCES OF AMAZONIA

The Amazon region encompasses the last of the planet's great rain forests and the greatest hydrographic basin in the world. Since the fall of the myth which professed the Amazon to be the "lungs of the world," scientists have attempted to understand its precise influence on the maintenance of the global climatic system. Studies are also underway regarding its potential as a natural research laboratory and as a "reservoir" of genetic diversity. Findings in this area hold myriad implications for the progress of advanced agriculture, industrial chemistry, and pharmacology. As one of the last unexplored regions of the earth, Amazonia exerts much fascination over the imagination of mankind, especially among those who live in less luxuriant ecological settings.

The Amazon basin covers an area comprising approximately 2.8 million square miles, which is equivalent to the area of Australia or to 90 percent of the territorial United States (contiguous lands). The river alone extends for over 4,000 miles—with more than 1,000 tributaries—discharging 170 billion gallons of water per hour, 60 times the rate of the Nile.

In this huge waterway live approximately 2,000 species of fish, more than all the aquatic fauna found in the Atlantic Ocean. The quantity of animal protein from these fish that can be economically exploited is potentially limitless. This would also provide a sensible alternative to efforts to produce animal protein from raising cattle—an activity extremely destructive to Amazonia's ecosystem.

In the Amazon region's complex cooperative network, there live up to two million species of organisms (this figure includes species of fungi and microrganisms), representing 60 percent of all life forms currently thought to exist on earth. Only 30 percent of these two million species have been categorized scientifically. In 1982, the United States National Academy of Science estimated that in just four square miles of the Amazon forest there exist 750 types of trees, 125 types of mammals, 400 types of birds, 100 types of reptiles, and 60 types of amphibians. The same report states that a single Amazon tree could support more than 400 species of insects.

Although scientific research on naturally occurring pharmaceutical substances is still very limited, it is known that 25 percent of the drugs used by Western medicine come from substances originally isolated from the rain forest. This is indeed a testament to the versatility of Amazonia's economic potential.

Among other resources available in the Amazon region, minerals—including iron, bauxite, gold, copper, manganese, silver, nickel, tin, and niobium—seem to be the ones with the greatest economic and ecological viability. Because there are many open deposits, mining often requires only minimal disruption of the primary vegetation while producing a high yield of resources. Just 0.017 square kilometers of the rain forest has to be cleared for every \$1 million of revenue. Cattle ranching, on the other hand, requires 100 square kilometers to be cleared to achieve the same result. Intensive extraction of Amazonia's mineral resources, however, is not in the interest of the traditional international exporters of above elements. Indeed, Amazonia's mineral deposits are so large that full exploitation would result in a dramatic restructuring of a number of international commodity markets.

There is also enormous energy capacity waiting be tapped in the Amazon basin. Electricity can be generated from water and natural gas resources. The electric company for Northern Brazil—Eletronorte—estimates that Amazonia could produce some 8,500 megawatts of electricity, tripling the current output of hydroelectric energy generated in the country. The construction of small-or medium-sized hydroelectric power plants, in conjunction with thermoelectric plants that make use of the recently discovered natural gas sources, represents a whole new range of possibilities for the production of energy. It should also help facilitate the economic development of the region while supplying the rest of the country with surplus energy.

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Despite all its riches, Amazonia's soil is poor. Only 11 percent of the area is fertile planting soil—half of which is subject to periodic flooding. This fact illustrates the impracticality of turning Amazonia into a major food-producing region. The true feasibility of major crop cultures remains to be determined. All that is known with any certainty is that the implementation of techniques that are successful in cooler climates is doomed to failure.

Experience has demonstrated that lack of success in agricultural projects is related directly to human attempts to "dominate nature." Conversely, projects that have dealt with the environment less aggressively have resulted in success. Examples of this include the farming of cocoa, guarana (a local beverage), dende (a type of coconut), and most notably, soybeans. Spectacular records of productivity have been obtained with soybeans through the proper use of the acid soil of the *cerrado* adjacent to the forest.

Other facts, however, are less encouraging. Learning to deal with Amazonia's rich and complex system has proven to be a costly process. Even though Brazilian Amazonia is large—approximately twice the size of all the countries in Europe combined—a considerable proportion of it (about 7 percent) has already been destroyed in the trial-and-error taming process. The greatest destruction occurred in the peripheral areas of the dense forest; the core, fortunately, has remained largely untouched. A decrease in the rate at which the forest is being devastated, as Brazilian and international public opinion demand, is a key objective of the Brazilian government's new measures.

THE SETTLEMENT OF AMAZONIA

Brazil's Amazon region represents almost 60 percent of the country's territory. But less than 10 percent of Brazil's population lives there, and the area generates less than 5 percent of the national income. Although Europeans have been in Brazil for almost 500 years, these figures demonstrate that human attempts at settlement have met few challenges posed by the region. The lack of advancement in this part of the country also indicates that no conventional model of economic development has proven to be viable in tropical rain forests.

An analysis on a broader scale must consider Brazilian Amazonia as part of the national economy, which in turn depends on the world economy. Thus this region should be regarded as just one of the many areas competing for national development projects. When these premises are kept in mind, the history of human settlement of Amazonia can be seen as part of a much greater process.

Until the beginning of the 20th century, when Brazil's economy was based principally on the export of raw materials, Amazonia was the world's main supplier of natural rubber. During this period, the region's ecosystems were virtually undisturbed, except in the rubber-producing areas where the extent of exploitation depended on oscillations of the rubber market. Competition from producers in the Far East, where more advanced technology and plantation methods lowered costs, eventually brought Amazonian rubber production to a near halt. The economy of the region declined rapidly as its more primitive technology eliminated profits.

From this era arose grandiose dreams. The most notable one was that of Henry Ford. This famous entrepreneur, known for his scientific methods of administration, was twice defeated by the rain forest. In the 1920s and again in the 1930s, his attempts to create rubber plantations failed. When the surrounding native vegetation was removed, the rubber trees died from the effects of rain, sun and disease until finally, "Fordlandia" ceased to exist in the Paragominas region of Para State. Ford's experience vividly illustrates how inhospitable Amazonian soil is when stripped of its natural coverage.

In the 1960s, the Brazilian government took a bold and risky step to revive the stagnated area and to make Brazil a world power. Investors were given tax incentives to buy up huge tracts of the Amazon lands for large-scale cattle ranching. But by ignoring long-range environmental effects the venture resulted in another spectacular economic and ecological debacle. More than twenty-two million head of cattle were put out to graze on these lands, divided into huge ranches encompassing more than five million hectares. All this pasture land was obtained by the destruction of virgin forests. The long-term infeasibility of this project was amply demonstrated by the fact that according to the Brazilian newsmagazine, VEJA, producing just one hamburger under these conditions required the destruction of seven square meters of wilderness!

Another spectacular project was that of American billionaire Daniel Ludwig. In 1967 Ludwig invested \$750 million in a venture designed to produce cellulose for paper products by planting homogeneous forests of gmelina arborea. Ignoring expert opinion, he decided to deforest the region using heavy tractors. The ground was levelled, the thin layer of humus destroyed and further ecological damage resulted. Soon enough, with financial failure in sight, this method was replaced with manual labor. And in 1982, under strong pressure from the government, the project was turned over to a consortium of Brazilian entrepreneurs for \$280 million. The scope of the project was then scaled down and new technologies were incorporated. By the end of the 1980s, the endeavor held out new promise as a massive experiment in the rational exploitation of the ecosystem.

The settlement of Amazonia has been determined by the patterns of migration. Between 1820 and 1920, the population of Brazilian Amazonia grew from 128,000 to about 1.5 million people. At present there are more than eight million inhabitants. Since 1820, the population of the area has grown sixty-two times, whereas the Brazilian population as a whole grew only thirty-three times during the same period.

One of the factors which contributed most to this population explosion of Amazonia was the opening of highways. Especially from the mid-1960s on, "Eldorado" tales of untold riches and unusual feats fueled the construction of these roads, but without proper regard for their impact on the environment. New avenues of travel opened up along the Madeira-Mamor railroad, which extended from Guaraja-Mirim to Porto Velho in Rondonia (this railroad functioned only until the 1970s but cost more than the Panama Canal to build). The Belem-Brasilia Highway linked the northern and central parts of the country. The Transamazonic Highway, covering a distance of about 2,300 kilometers, made east-west traversing of the region possible even though some parts of it are unpaved and impassable during rainy seasons. With a dream not unlike that of settlers of the American West, 8,000 poorly-prepared families between 1970 and 1974 migrated to the border areas of the highway. This scheme, however, failed for reasons similar to those which defeated other grand ventures in the region. Now both the people and the forest can only try to heal their wounds.

Two of the largest Amazon ventures of the 1980s are the "Grand Carajas" project (with \$3.5 billion invested in a complex, integrated mining operation) and the "Polonoroeste" project, involving the construction of roads and settlements to alleviate demographic pressures in the highly populated south-

eastern part of the country and the development of arable land areas in the southernmost Amazonian state of Rondonia.

In Carajas, in the state of Para, lie the world's largest mineral deposits, including the greatest deposit (18 billion tons) of high grade (66 percent) iron ore. In order to transport the mined products (31 million tons of iron ore and 500,000 tons of manganese in 1989) to the port of São Luiz in the state of Maranhao, an 890-kilometer railway was built. The project is expected to generate an annual export income of about \$700 million and to create some 5,000 new jobs. Although extra care was taken to protect the environment, the project has one glaring defect: to convert iron ore into cast iron, several charcoal-powered mills are being installed alongside the railway.

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While the Carajas project is considered a success at least with regard to mining, the Polonoroeste project has generated an array of problems since it was launched in 1981. The rise in uncontrolled migration makes it impossible to organize the settlements. On the other hand, the use of inadequate techniques, the small amount of land suitable for agriculture (less than 20 percent), the accelerated destruction of the forest and tropical diseases have reduced productivity and disillusioned the immigrants. The immigrants, left with no alternative, increasingly became attracted to the risky activities of gold washing and cassiterite mining which polluted the rivers with mercury and mud. The failure of settlements, then, has directly resulted in increased pressure on the maintenace of a clean environment.

Although not oblivious to the failures of the past, Brazil is optimistic about the future. Roads, dams, high voltage transmission lines, gas ducts, and human settlements continue to be built in the Amazon region with the financial and technical assistance of the World Bank, the InterAmerican Development Bank (IDB), the European Community (EC) and the Government of Japan. A positive aspect of this external financing is that approval requires incorporating all available knowledge and lessons from past experiences in the environmental impact assessment of each project.

As discussed above, when the general strategy of Brazilian development rested on the export of raw materials, the role of Amazonia was to supply natural rubber. Today, when Brazil is striving for "competitive integration"

in the world economy as a partner and a competitor, Amazonia must demonstrate its comparative advantage. There are two ways of achieving this. One is by exploiting its mineral deposits through the use of large-scale projects and simple techniques, thereby offering more competitive prices. The other is by cultivating Amazonia as a living laboratory of the accelerated development of innovative products. This could be accomplished by joint ventures, which may include foreign partners.

The main points of President Collor de Mello's policy toward the environment was outlined in the *Journal do Brazil* on January 21, 1990. His policy places special emphasis on Amazonia. One of the most innovative and positive ideas put forth was an alternative compulsory service, along the lines of military service, designed to recruit young people for environmental activities. To execute federal environmental policy, another proposal envisages the creation of a National Environmental Secretariat directly subordinated to the office of the president. Under the new administration every ministry will have to define environmental priorities and objectives and designate an officer responsible for environmental matters.

As a first measure of impact, President Collor intends to analyze with his economic staff proposals for the suspension of new government incentives, subsidies, and credits for activities which have proven to result in negative environmental impacts. Another proposed measure is the suspension of all exports of raw timber with the exception of timber from areas flooded by hydroelectric plants. With regard to Amazonia specifically, the document proposes that the unexplored areas be submitted to a controlled pattern of occupation "that does not necessarily entail immediate exploitation, or the total protection of the entire Amazonia." Further, a satellite, already in use by the Institute of Space Research of São Jose dos Campos in São Paulo, will permanently monitor the region, particularly its more fragile areas of degradation and of agricultural frontiers. Finally, the Carajas Project will be reviewed with the aim of "immediately suspending the installation of the cast iron mills fuelled by charcoal located alongside the railway."

ATTEMPTS TO INTERNATIONALIZE AMAZONIA

The developed countries' interest in Amazonia extends back at least to the mid-19th century. Although their interests are often founded on scientific curiosity and find inspiration in the desire to conquer the unknown, there are very clear economic interests as well. Such economic interests, however, are not readily admitted, and intervention in Brazilian internal affairs is justified on the pretense of averting "crimes against humanity."

Due to the recent thaw in the Cold War, the superpowers have shown a renewed concern for environmental problems. While the above pattern continues to manifest itself, this time, the pursuit of economic interests is cloaked in the rhetoric of an environmental crusade.

Diplomatic documents reveal that in the mid-19th century during the campaign to establish the principle of free navigation of the great rivers—

which incidentally was not acceptable for the Mississippi—Brazil was accused of committing a crime against humanity because it refused to acknowledge this supposedly enlightened precept. Coincidentally, this was when the "Amazon Steam Navigation Company" was created by Le Roy, Bayard and Co., and The Amazon and Atlantic Slopes of South America, by M. F. Maury was published. Maury, one of the chief defenders of the free navigation principle, states, "the Amazon cannot be closed to humanity; it is awaiting a strong and determined race to implement its economic and scientific conquest." In 1902, the European diplomat, Oswald Richtfen, echoed the same sentiment: "it would be convenient that Brazil should not deprive the world of the natural riches of the Amazon." And earlier this century, US Secretary of State John Hay said, "the fact that industrial companies are installed with the intention of developing land which otherwise lay unused, does not seem to me to jeopardize the sovereignty of the American nations."

Similar arguments are being made even today. On May 6, 1989, at the meeting of the presidents of the countries of the Amazon region, President José Sarney of Brazil quoted a passage steeped in colonial overtones: "the Amazon is considered by us to be mankind's heritage. The ownership of this immense area by a few countries is merely circumstantial. It is our duty to guarantee the preservation of the Amazon and of its primitive inhabitants, for the use of the great European civilizations whose wild areas have become reduced to critical limits."

Along the same lines, the Hudson Institute, directed by the well-known futurologist Herman Khan, in 1967 developed a pharaonic plan ("exciting and bold," according to its authors) which sought to "create a new Mediterranean culture" in the Amazon basin. This would have entailed the building of a large dam near the city of Obidos in the state of Para (where the narrowest point of the river is) the creation of the world's largest fresh water reservoir "for the sake of mankind." All the land in the region below forty-five meters in height would have been flooded even though the area harbored many inhabitants. The economic gains from the transport of raw materials by water, the energy generated, and other benefits, according to its authors, would be of similar magnitude as those which resulted from the building of the transcontinental railway in the United States. It was not clear at the time to whom these benefits would flow.

Within Brazil, the recurrent pressure to internationalize Amazonia has led to the crystallization of the Brazilian "national security doctrine." After the 1964 military take over, the Brazilian government maintained that Brazil should occupy the region at any cost in accordance with the legal principle of *uti possidetis*. The great cattle-raising campaigns and the approval of Daniel Ludwig's huge development project date from the mid-1960s. Moreover, the nationalistic Rondon Project was extended to include Brazilian Amazonia. Under the theme "integrate so as not to give away," university students recruited from all over the country performed tasks similar to Peace Corps volunteers with the help of the army.

AMAZONIA AND BRAZIL TODAY

The occupation of Amazonia, a huge territory of limitless potential, most of which remains untouched, is taking place in a manner compatible with the social and economic imperatives of the Brazilian nation. As democracy flourishes in the country, parts of Amazonia are being developed in a more rational and sustainable manner. As in other parts of the world, open and frank discussions should help ensure the application of a development process less damaging to humanity and the environment.

Historically, the Amazon region has played many different roles in Brazil's development. Having started out as the major source of rubber for international commerce, it went through a period of dormancy when more profitable sources of rubber were discovered elsewhere. Amazonia is now mostly an area for scientific research. It acts as a biotechnological laboratory where some aspects of the national strategy of "competitive integration" in international markets may be realized.

For the sake of the rational occupation and development of Amazonia, Brazil is now making the best use of its available resources. Needless to say, in terms of absolute amount of investment for environmental concerns, it is not much. However, it is a reasonable amount for a developing country that is fighting to address environment issues, but is confronted with the tremendous pressures of bringing about development for its population.

It is important to remember that on July 3, 1978 Brazil and seven other countries of the Amazon region (Ecuador, Guyana, Peru, Suriname, Venezuela, Bolivia and Colombia) signed the Amazonian Cooperation Treaty in a coordinated attempt to develop and protect the area. Since then, several meetings have been convened at various levels to discuss new problems and joint actions to be undertaken to resolve them. For example, on March 6, 1989, the foreign ministers of these seven nations met in Quito, Ecuador and issued the "Declaration of San Francisco de Quito," which, among other things, established a special commission for the Amazonian environment and a special commission for Indian affairs.

Further, the presidents of state parties to the Amazonian Cooperation Treaty, meeting in the city of Manaus in Brazil on May 6, 1989 adopted the "Amazon Declaration," which stated:

We emphasize the need that the concerns expressed in the highly developed countries in relation to the conservation of the Amazon environment be translated into measures of cooperation in the financial and technological fields. We call for the establishment of new resource flows and concessional terms to projects oriented to environmental protection in our countries, including pure and applied scientific research and object to attempts to impose conditionalities in the allocation of international resources for development. We expect the establishment of conditions to allow

free access to scientific knowledge, clean technologies and technologies to be used in environmental protection and reject any attempts made to use legitimate ecological concerns to realize commercial profits.

Contrary to what some may think, Brazil is not a country unable to cope with its own problems. In spite of many adversities, it has grown to become one of the ten largest industrial economies of the world. Brazil's economy has the capacity for growth. It should not be forgotten, however, that this rapid growth was achieved at the expense of social imbalances. Brazil's high growth rates sometimes led to what René Dumont called "bad development." Brazil still has not solved the problem of poverty for the great majority of the population, and this fact has been very costly to Brazilian society in general. Various projects to incorporate new territories into the national economy have failed mainly due to the enormous pressure exerted by the migratory currents of resourceless people. The government simply has not been able to cope with the growing demand for social and economic infrastructure in Amazonia as well as in other parts of the country.

In spite of its harsh economic and financial realities, Brazil has an environmentally progressive constitution.

A conscientious observer, then, will notice what dramatic and startling progress Brazil has made in environmental affairs. In spite of its harsh economic and financial realities, Brazil has an environmentally progressive constitution. A few months after the idea that "pollution was growth" was defended at the Stockholm Conference on the Human Environment in 1972, the Brazilian government created its first agency for environmental protection. With democracy flourishing, more and more people are becoming conscious of environmental concerns. Recently, the public's enthusiastic response to national and international celebrities' call for the protection of Amazonia has spurred the government to adopt a series of far-reaching measures under the name, "Our Nature." The most significant of these include the suspension of all government incentives to cattle-raising enterprises in any forest or adjacent areas; the imposition of stiff regulations on the export of raw timber and of all wood products; the creation of environmentally protected areas such as the National Forests of Amapa and Tefe¹; the proposition of a new bill of laws to

^{1.} As a matter of fact, a recent report by United Nations Environment Programme (UNEP) on tropical forests

modify the institutional arrangement for environmental protection at the federal level and the submission to the National Congress of new laws to establish standards of a forest policy for Amazonia.

Among the "Our Nature" initiatives, special attention should be given to the institution of "extraction reserves." After the tragic and internationally-publicized death of Chico Mendes, leader of the rubber-gatherers, it became clear to many Brazilians that one of the most promising ways to preserve the Amazon forest is to use its renewable resources in a rational manner. To make use of natural resources while not exhausting them requires knowledge. Starting with the proposition that the local inhabitants, brought up in intimacy with the forest's rhythms, are best qualified to be its guardian, it was decided to find ways of dignifying those locals. The "extraction reserves" are supposed to create community settlements by using the know-how the rubber-gatherers inherited from their Indian ancestors in conjunction with more modern technologies. It is hoped that this in turn would promote a self-sustaining development more amenable to local ecosystems.

CONCLUSION

It is true that in man's attempts to conquer Amazonia many mistakes have been made with severe environmental consequences. However, it is also true that not only is the process of predatory exploitation of its natural environment beginning to be curtailed, but significant areas of Amazonia have been settled successfully. In this process, the pressure of internal and external public opinion has been of great importance.

Amazonia possesses immense resources—water, fauna and flora, minerals—which can be exploited with relatively small and controllable environmental repercussions. It is therefore unreasonable to demand that a country of mostly poor people that is saddled with an enormous foreign debt burden should not utilize the natural resources within its territory to improve its living standards. If the conservation of tropical forests is as important to developed countries as one is led to believe, this concern should be translated into cooperative financial and technological measures directed toward that end. Attempts to construct such an arrangement have already taken place.

For example, in early 1986, Dr. Mostafa Tolba, executive director of UNEP, envisioned holding a World Conference on Tropical Forests. The goal of the conference was to achieve concrete results rather than to engage in sterile discussions. As a preliminary to this conference, Dr. Tolba gathered in Nairobi the representatives of the countries which in their respective continents possessed the largest areas of tropical forest (namely Brazil, Zaire, and Indonesia). The objective was to elaborate a common position on the terms under which the underdeveloped countries would accept help from the developed nations for the conservation of their tropical forests. Without renouncing their sovereignty over these areas, the underdeveloped countries agreed to discuss with

states that "over the past fourteen years, officially protected areas have more than tripled; both Brazil and Indonesia now protect as much as the whole world did in 1972."

the developed ones their participation in a program of conservation in which significant areas of their tropical forest would be designated for conservation over an established period of time. In return, the underdeveloped countries would receive financial compensation—through a fund to be created with contributions from the developed nations—for the non-use of the resources contained within these areas. The compensation would be used to monitor the demarcated area. Unfortunately, this initiative did not receive the support expected when it was brought to the attention of the developed countries, the greatest consumers of products from tropical forests.

All who seek a better environment to assure the quality of life for future generations are partaking in the same struggle: attaining truly self-sustaining economic and social development for all inhabitants of our planet while displaying proper respect for nature. It must be recognized, however, that "environmental flags" have been used many times for purposes that have very little to do with the environment. Perhaps perceiving and denouncing these ulterior motives too are an integral part of the struggle.

In conclusion, the present state of Brazil's economic development implies that there are two relevant factors directly influencing the way in which Amazonia's resources are utilized: structural poverty and the foreign debt. Both can be resolved in a positive fashion without harming Amazonia's environment, provided that nations cooperate, and, in doing so, respect Brazil's sovereign rights over its territory.