

# Protecting the Rainforest: A Brazilian Case Study

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## I. Abstract

Rainforests are disappearing at a higher rate than ever before as a result of the dramatic human modification of the natural environment. A significant percentage of the remaining tropical forest cover is found in Brazil, where fauna and flora destruction constantly escalates. It is imperative that deforestation is stopped in Third World countries such as Brazil before the full effects of development, industrialization and population growth are felt, and the last patches of tropical forest are eliminated from the planet. This project analyzes methods for curbing forest destruction in Third World nations using Brazil as a case study and offers suggestions for reform. What are the legal and extralegal tools available to halt deforestation in developing nations? How are these tools used in Brazil and what is the



optimal tool available for forest protection? Brazilian environmental law is the primary data source. Secondary analysis is based on works of prominent scholars in the field of law and environmental protection in Brazil and North America. Research results suggest that a multilateral partnership, such as the international Pilot Program to Conserve the Brazilian Rain Forest, and the enforcement of a strict body of national environmental law are the optimal methods to achieve tropical forest conservation. The conclusions this research will draw aim to assist in the global battle against destruction of worldwide rainforests.

## **II. Introduction**

The focus of this research is the analysis and suggestion of methods for curbing forest destruction in Third World nations using Brazil as a case study. What are the legal and extralegal tools available to halt deforestation in Third World countries? How are these tools used in Brazil? What is the optimal method to curb tropical deforestation? The main objective of this research enterprise is to survey the tools accessible to curb deforestation in poor nations with emphasis in Brazil, as well as to suggest recommendations that will assist in the global battle against worldwide rainforest protection.

As a consequence of the research for this project, it was found that no studies have been designed to answer questions similar to the ones posed by this research. The absence of a comprehensive study that evaluates legal and extralegal methods to protect forests proves a compelling motive for the execution of the proposed study. The definition of a few terms is instrumental in the comprehension of this research. Deforestation is defined by Ledec as "total elimination, or mere modification...of the original cover...resulting from both conversion to non-forest uses and forest cutting that exceeds regrowth rates" (1985). Rainforest, also called tropical forest, referred to in this paper is best characterized as "evergreen or partly evergreen terrestrial forests, in areas of geographic tropics receiving no less than 100mm. of precipitation in any month for two out of three years" (Ledec, 1985). Sustainability includes practices that will not result in the depletion of natural resources. Civil society is the organized citizen activity which monitors the government and other societal institutions. All monetary figures are in United States dollars unless otherwise noted.

Forests, currently covering 30 percent of Earth's land surface (or about 3 870 million ha) are disappearing at a higher rate than ever before as a result of the dramatic human modification of the natural environment (FAO, 2001). It was not until the Industrial Revolution took place in the 1800s that the planet experienced the full extent and intensity with which human technology could harm the environment. As Industrialism spread across the world, at different rates everywhere, major land modification occurred, and with the changes came environment deterioration in the form of deforestation, soil, air, and water pollution, and decrease of biodiversity. "FRA 2000 revealed that the estimated net annual change in forest area worldwide in the 1990s was 9.4 million ha" (FAO, 2001), which is an alarming figure.

Although Russia harbors the largest percentage of global forests, the remaining significant stretches of tropical forest are encountered primarily in Latin America, with the largest percentage of forest found in Brazil. About 50 percent of the world's total rainforests is in Latin America; approximately 25 percent is in Southeast Asia and South Asia; and Africa, has about 15 percent (Ledec, 1985). These areas are significant because they are composed predominantly of extremely poor nations. It is imperative that deforestation is stopped in Third World countries before the full effects of development, industrialization and population growth are felt, and the last patches of tropical forest are eliminated from the planet.

### **III. Background**

#### **1. Brazil**

Brazil is the fifth largest country in the world in surface area and has a population of approximately 170 million people. The forest area is 5.3 million sq. km of forest cover, out of 8.5 million sq. km surface. Brazil harbors 20% of the global biodiversity and it had a deforestation rate change of 0.4 percent between 1999 and 2000. Brazil's National Institute for Space Research (INPE), which monitors deforestation by satellite, estimated the annual rate of deforestation between 1998 and 1999 to be 17,259 sq. km. The figure between 1999 to 2000 amounted to 19,836 sq. km, which demonstrates an increase in destroyed forest cover between the end of 1999 and the end of 2000 (FAO, 2001).

The Brazilian political system is federalist with emphasis on the power of the federal government instead of the American model of decentralized power of state governments. The justice system in Brazil is tailored after the Roman tradition of civil law, where laws are enclosed in civil codes that go unchanged for long periods of time. Courts do not have the power to create common law as is the case in Anglo nations, and the judges' actions must follow strictly from written law.

In the environmental field, the Ministry of the Environment (a branch of the federal government) has responsibilities on the following areas: national policy of the environment; policy of preservation, conservation, and sustainable use of the environment; drafting of social and economic strategies to the betterment of the environmental quality and sustainable use of natural resources, among others (Machado, 2002). Another noteworthy agency of the federal government is the Brazilian Institute for the Environment and Renewable Resources (IBAMA) that was created in 1989. This federal agency works in many ways similarly to the Environmental Protection Agency (EPA) of the United States. The IBAMA is in charge of policing protected forest areas and it has the power to implement policies drafted by the Ministry of the Environment. The particularities of the Brazilian environmental law will be discussed further in this study.

#### **2. Causes of Tropical Deforestation**

Tropical deforestation is a widespread occurrence in developing nations, caused mainly by internal and external pressures, as well as government corruption. All forces driving deforestation ultimately touch on the economic pressures these poverty stricken societies and governments suffer. Deforestation does not occur in a vacuum, international as well as domestic dynamics influence and are influenced by the environmental deterioration of rainforests. The internal pressures escalating deforestation result from the population and include illegal settlements (need for housing), slash-and-burn agriculture, cattle raising, collection of firewood, lack of education in regards to sustainable agriculture and ranching. The government also generates internal pressures when initiates the construction of large dams and highways and mineral extracting that is prejudicial to the environment.

Pressure also comes from the outside, when other nations provide the demand for forest resources. Developing countries will supply whatever raw materials found in their forests in order to increase their exports revenue. Government corruption is also a serious and pervasive action that includes allowing illegal occupation of forestlands, illegal logging, illegal timber transport and timber smuggling, and illegal forest processing (operating without a license, disregarding laws and regulations, etc). The most disturbing aspect of this issue is the dimension of the consequences that will surely follow if practice of unrestrained unsustainable forestry is continued.

### 3. Consequences of Tropical Deforestation

A healthy rainforest ecosystem prevents a number of natural disasters from occurring. The regulating watershed functions provided by tropical forest are lost as soon as the natural vegetation is destroyed. The soil without cover is extremely susceptible to erosion, which will allow the sediment to be washed away to streams, clogging rivers and disturbing fisheries. According to Ledec, "typhoon damage in the Philippines amounts to roughly \$20 million per year, through floods and landslides that are greatly intensified by deforestation" (1985). The disturbance of fisheries directly impacts local communities that depend on fishing to survive. An approximate 500 million people depend on worldwide forests to survive (Mello, 1999) and any disturbance to the forest's biome will certainly disrupt the lives of tribes and other communities that live in the forests. In Brazil, deforestation also destroys the social fabric of the 220 local tribes whose culture is intrinsically involved with their natural environment. Local indigenous people have brought attention to their issues by emphasizing their ancient wisdom regarding the use of the plants and animal products to cure diseases.

The irreparable biodiversity loss due to forest destruction causes the depletion of a very promising source of medications and raw materials. Robert Constanza in the May 1997 issue of *Nature* magazine approximated the value of the Brazilian biodiversity to amount to a rough \$2 trillion, a figure that does not include future patents and technologies developed from this biodiversity. An instance of the potential of the untapped wealth enclosed in the rainforest is the success of drugs such as Capoten, produced by Bristol-Myers Squibb. Capoten's main active ingredient is made with a substance found in the venom of the jararaca, a snake species found only in Brazil. This medicine regulates blood pressure, and has generated an annual profit of \$5 billion. The coordinator of the biodiversity conservation program of the Brazilian Ministry of the Environment has often pointed out that less than 1% of the native species of the Brazilian rainforest has been genetically researched. The world risks an immense loss of the genetic wealth enclosed in tropical forests if deforestation continues at present rates.

Another significant impact is the influence tropical forest destruction has in increasing the global greenhouse effect (Ledec, 1985). Schwartzman (1999) has focused on the relations between forest fires and climate change. This researcher brings attention to the dangerous vicious cycle that may emerge with climate change, which is described as "the prospect of climate change inducing drier conditions in tropical forests, leading to larger and more destructive fires, which in turn speed climate change" Schwartzman (1999). Deforestation reduces leaf surface available for evapotranspiration, which is defined as the cycling of rainwater through plants and trees. Evapotranspiration accounts for half the rain that falls on Brazilian rainforests. The impact of the reduced rainfall is ultimately the increase of fires, which then accelerate climate change (Schwartzman, 1999). Rainforest destruction will most certainly impact the global climate balance, which can have catastrophic consequences to the entire planet.

The rainforest also provides an aesthetically unique surrounding and spiritual inspiration to many. The intrinsic value of rainforests alone is a significant incentive for action in behalf of their conservation. Surely the losses due to deforestation are considerable, and the causes pressing. Definite action should be taken in order to alleviate the needs of those who destroy the forests and to repair the damage that has already been done.

#### **4. Challenges in Curbing Tropical Deforestation**

The Third World shares a series of characteristics that set these nations apart from wealthier countries. Poor nations are usually found in tropical regions of the globe, and their economy is based primarily on agriculture, herding, timber and mineral extraction. Their populations are relatively large, when based on the available resources to support such population, and their progress is hindered by lack of natural resources or technology, constant warfare, inefficient infrastructure, massive national debts, corrupt governments, and lack of power in the political and economic international arena. Although similar in many ways, developing countries are diverse in societal and cultural aspects, which present an obstacle in the way of those willing to design international forestry laws and policy that would hamper the deterioration of tropical forests. The use of Brazil as a case study is relevant because Brazil harbors the largest percentage of tropical forest in the world, and because several approaches have been attempted in the fight against deforestation in this country. The lessons learned by Brazil can surely be generalized to other nation under similar conditions.

### **IV. Method**

#### **1. Research Problems and Solutions**

Primarily the intention of the research was to find forestry laws that regulate the international realm and restrict the rate of deforestation in Third World countries. However, it was quickly found in the first steps of the research that there is a deficiency of international deforestation policies. The existing lack of such laws made the first intention of the research virtually impossible to be fulfilled. Instead, focus was broadened to encompass the current legal and extralegal methods to halt deforestation in developing nations. Brazil will be used as a case study in order to give substance to the evaluation of tools to curb forest destruction.

The researcher's ability to speak Portuguese and ties to Brazil provided the opportunity to deeply evaluate Brazil as a case study. Because international deforestation law is virtually inexistent, focus was shifted to the evaluation of international forestry principles and extralegal techniques used for forest protection. Brazil's experiences are utilized to demonstrate an array of methods, whether successful or not, used to curb the rate of deforestation of tropical forests. The shift in direction caused the search to encompass a broader array of scholarly works than intended in the first phase of the research.

#### **2. Search Engines and Keywords**

Internet searches were conducted using primarily Lexis-Nexis Legal Research. Antpac, the search engine for the University of California Irvine libraries, and CDL/Melvyl, the University of California Internet search engine were both utilized to a lesser degree. The language used for these searches was English, and the great majority of articles reviewed were published by American scholarly journals and law reviews. The first keywords used on the search were deforestation, environmental, international, and law. Although over 500 articles were found using Lexis-Nexis within these parameters, the majority of the works was not relevant to the study at hand. Searches limited by other keywords was done, and the several hundred articles selected by the search engine were judged by their degree of relevancy. Other keywords used in the following searches included Third World countries, developing nations, forestry law and policy, World Bank, Non-governmental Organizations (NGOs), urbanization, enforcement and implementation mechanisms, logging, tropical forests, timber industry, environmental policy, nonprofit organizations, among others.

Although Antpac and CDL/Melvyl were also employed in the search, the results were very limited and not relevant to the study. Books that were relevant to the study were assessed, and few were chosen based on their quality, reliability, and comprehensiveness.

Although works selected were primarily written in the 1990s and 2000s, some pertinent earlier works are also considered in this review. Focus was placed on Law Reviews, government publications, and books written by scholars on the field, given these were the authorities on the issue at hand. All searches were conducted in order to find works that have been written in the past fifty years.

Internet searches for other sources in Portuguese were found through the search engine Google at [www.google.com](http://www.google.com) and by selecting Portuguese as the language and Brazil as the country in the search. Keywords used included Amazônia, meio ambiente, lei ambiental, constituição federal, conservação, desflorestamento, and recursos naturais. The books and journal published in Brazil cited in this study were found in Brazil.

Since a very large pool of sources was available on the subject, all of the works selected for this literature review were chosen according to quality. A minimum standard was set so articles and books could be chosen on that basis, and works that seemed unreliable, incomplete, or irrelevant were discarded. The criteria used include the accuracy of information provided, quality of writing, wealth of sources and references, reputation of writers, relevancy to research, and date published (preference to the latest works).

### **3. Organizing the Literature**

The broad range of academic works examined can be generally grouped in three major clusters. The first group includes contextual books that provide background information on the major issues presented. The second group includes techniques aimed at restricting deforestation in developing nations. This group is broken down into international law and policy, and institutional efforts including the roles of the World Bank, NGOs, and market-based regulations. The third group encompasses Brazil as a case study and its experiences with national and international efforts to curb the destruction of national forests.

Interestingly enough, the extended search conducted for the literature review did not encounter one study similar to the study conducted. No single research included both an evaluation of legal and extralegal mechanisms to control deforestation and a comprehensive analysis of Brazil's experience with controlling tropical forest destruction. The two main goals of this research are to use both primary and secondary sources to offer a comprehensive survey of methods available to curb deforestation in developing nations and to conduct an assessment of techniques used to protect the forests in Brazil.

The remainder of the paper will be divided into themes or tools available for the preservation of tropical forests in developing countries. The themes encompass an overview of the international legal treaties and policy regarding forestry practices, an outline of the economic incentives used by the World Bank to curb deforestation, a review of the participation of the civil society (i.e., Non-governmental Organizations) in environmental protection in developing countries, an assessment of the Pilot Program to Conserve the Brazilian Rain Forest, an evaluation of the importance of the emerging market-based regulations concerning forest protection, and an analyses of Brazilian environmental law.

### **V. International Law & Policy**

The dissemination of international environmental treaties, agreements, and protocols has been tremendous in the past quarter century, amounting to over 250 international environmental law and policy treaties. The issues surrounding deforestation and protection of old growth forests were not the focus of the early international summits and agreements. In fact, the earliest environmental accords focused mostly on commercially valuable flora and fauna (Weiss, 1998). Most of the first treaties and summits concerned with environmental protection took place in the early 1970s.

In 1970, the United Nations Educational, Social, and Cultural Organization (UNESCO) established the Man and Biosphere Program (Royer, 1996). This program suggested the protection and sustainable use of biosphere reserves around the globe. Later in the same decade, the Stockholm Declaration presented a global agreement on environmental problems. Although the Stockholm Declaration did not offer a set of specific rules relating to the protection of forests, the meeting did signal the increasing global concern regarding the protection of the environment. International summits such as the World Conservancy Strategy of 1980 and the World Charter for Nature of 1982 followed the Stockholm Declaration. Such meetings however, did not set principles that directly addressed the issues regarding forest protection, leaving much to desire to future treaties.

### **1. International Tropical Timber Agreement**

Sprouting from a concern over timber trade between producer and consumer nations, the International Tropical Timber Agreement (ITTA) was negotiated in 1983 and later went into effect in 1985. The objective of the treaty was to promote fair trade conditions between industrialized nations and developing countries. ITTA aims to promote research and development to improve forest management, to encourage wood processing in the producer nation, to improve market intelligence, to promote wood utilization, to encourage industrial tropical timber exports, and to promote reforestation and sustainable forestry practices (Weiss, 1998). A successor treaty to ITTA was put in effect in 1997, and it focused slightly more on sustainable forest use. The governing body of ITTA is the International Tropical Timber Council (ITTC), which oversees the International Tropical Timber Organization (ITTO). Funding is dependent upon voluntary contributions, which results on a limited budget that amounted to only \$28.5 million in 1990 (MacKinlay & VanderZaag, 1996).

Brazil joined ITTA in March 1985 with the primary interests of improving its timber trade with consumer countries and of guarantying its place in the treaty. The Division of Basic Products of the Ministry of Foreign Relations is in charge of implementing the treaty and IBAMA aids in the selection of projects that will be supported (Aragão & Bunker, 1998). The Brazilian environmental law, one of the most rigorous of the world, is generally in accordance with the principles of the ITTA, although, environmental law in Brazil is sparsely and inconsistently enforced. Although the Brazilian government has adopted policy and regulations that coincide with general objectives of the treaty of sustainable forestry management, lack of resources and technology allows massive illegal deforestation to go on unpunished.

Between 1987 and 1997, only twenty-four projects were funded and approved under the treaty amounting to approximately \$13 million (Aragão & Bunker, 1998). The projects have become fewer in the past years and have had a very limited effect on the implementation of ITTA's goals in Brazil. Although the targets of the treaty are very ambitious in regards to the development of forestry technology and sustainable use of tropical forests, the resources are limited and insufficient to fulfill ITTA's objectives. According to Mello (1999), the lack of interest in development of sustainability projects in producer nations is due to the fact that ITTO's host country is Japan, which is one of the largest timber importers and tends to pressure the approval of projects that advance primarily the interests of consumer nations.

In Brazil, the successfulness of the implementation of international treaties such as ITTA depends deeply on the participation of states that host tropical forests, since state governments are the ones that will further ensure that policies and regulations are enforced. ITTA involves the countries in a federal level, which tends to isolate the states in the policy making and project implementation process. Araújo & Bunker (1998) also criticize the treaty by arguing that in spite of the participation of NGOs such as Fundação Pró-Natureza

and Núcleo de Direitos Indígenas in ITTA projects, Brazilian NGOs tend to reject the commercial facets of the treaty and tend not to support ITTA.

The participation of NGOs and indigenous peoples in the implementation and creation of ITTA projects is very limited. NGOs tend to have a more active role in producer countries, and generally serve as watchdogs for illegal timber trade and unsustainable forestry activities rather than enforcers of ITTA's policies. Forest dwellers are not even mentioned in the documents of the agreement, and therefore their needs remain ignored. Participating nations have not fulfilled many of the civil society's concerns over sustainable forestry, which the ITTC promised to incorporate in future policies.

Another criticism is that consumer countries have more influence than producer countries in the policy making process of the organization. MacKinlay & VanderZaag (1996) argue that ITTA emphasizes timber consumption rather than conservation and it also allows slanted voting powers to the consumer countries. A fundamental flaw in ITTA regarding forest protection is the focus on timber and its value as a trade commodity rather than a focus on the diverse values of tropical forests. ITTA was not designed to be a tool in the protection and conservation of tropical forests, and it remains ineffective in the control of tropical deforestation as it encourages timber harvesting.

Weiss (1998) claims ITTA has been highly ineffective, as shown by the low compliance rates to guidelines, to timber trade reporting requirements, and to required payments to ITTO. Lack of funding of ITTA projects, deficient regulation at a national level, lack of involvement of state governments, limited support of tribes, forest dwellers and NGOs, prevalence of advocates of consumer nation interests in the governing body of ITTA, and focus on timber trade are all reasons why the treaty has been unsuccessful in providing true sustainable forestry practices in Brazil.

## **2. Tropical Forestry Action Program**

The Food and Agriculture Organization (FAO) is one of the largest United Nations agencies with 183 member countries. FAO focuses on agriculture, forestry, fisheries and rural development issues. FAO's focus since its inception in 1945 has been on poverty and hunger alleviation, however, with the growth of global deforestation, FAO started to develop a sector dedicated to forestry in the 1980s. In 1985, FAO sponsored the Tropical Forestry Action Program (TFAP) in conjunction with the UNEP, the World Bank, and the World Resources Institute (WRI). The program has five main parts: forestry and land use, forestry-based industrial development, fuelwood and energy, conservation of tropical forest ecosystems, and institutions (MacKinlay & VanderZaag, 1996). TFAP was created as a global program of forest conservation and development, and has as its objectives to gather financial support to National Forestry Action Plans (NFAPs), which are projects that seek sustainable forestry and action against deforestation. The TFAP has had a few positive impacts, however, its limitations are significant and include its failure to involve Brazil in the program.

FAO has the considerable participation of approximately 97 countries that represent about 78% of all countries with tropical forest resources, with one of the most significant non-participants being Brazil (MacKinlay & VanderZaag, 1996). The program has also had the ability to increase development assistance to forestry from \$500 million per year in 1975 to \$1,093 million annually in 1988. The TFAP has had some constructive achievements that include an extended international participation, growth in financial assistance, and enhanced natural resources management (MacKinlay & VanderZaag, 1996). For instance, in Sierra Leone, the NFAP has helped organize all forestry extension and training programs and aided in the enhancement of the Wildlife Conservation Unit (MacKinlay & VanderZaag, 1996). In Jamaica, the NFAP brought attention to the need of a national land use plan, and encouraged the use of an environmental impact assessment before any major projects that may affect the

environment (MacKinlay & VanderZaag, 1996). As pointed out before, the advancements on sustainable forestry practices due to the TFAP has been limited and its limitations are plenty.

The TFAP has failed to achieve national policy reform and to spread new technology and information about deforestation. Funding to NFAPs has dwindled and the program is likely to become even weaker. As was the case with ITTA, the TFAP practically has ignored the needs and implications of its initiatives on forest dwellers and local stakeholders. TFAP's failure is also due to the lack of openness to NGO involvement in its policy creation. Since the inception of the program, the TFAP has focused on a sectoral approach to the deforestation problem rather than addressing the root causes of tropical forest deterioration, which include poverty, hunger, unemployment, unequal land distribution, foreign debts, among others.

The TFAP has also emphasized forest harvesting and industrial forestry projects over conservation projects. In 1988, funding for forest-based industries amounted to 32% of donor funds, while conservation projects received 8.8% of funding (MacKinlay & VanderZaag, 1996). In fact, after the inception of the TFAP, deforestation has actually increased from the 1980 rate of 11.3 million ha per year to the 1990 figure of approximately 17 million ha annually (MacKinlay & VanderZaag, 1996). Lack of funding, insufficient NGO and community participation, and focus on commercial over sustainable forestry have caused yet another effort to fail.

### **3. Forest Principles**

Soft law such as the well-known Forest Principles (a set of standards for sustainable use of forests), suggested by the United Nations 1992 Rio Earth Summit, offers a valid framework within which hard forestry law can be drafted. One of the strengths of the Principles is the attempt to get the international community involved in the conservation of forests found in the developing world. Developed nations are encouraged to assist developing countries technologically and financially with the fight against deforestation. The agreement is also very specific in its suggestions of how to conduct the sustainable development of forests.

Scholars, however, criticize the Forest Principles for providing a flawed set of standards. Royer (1996) detects contradictions within the Principles, namely the suggestion that all unsustainable forestry practices should be altogether abandoned and the idea that "states have the sovereign and inalienable right to utilize, manage and develop their forest in accordance with their development needs" (Royer, 1996). The document in question does not address one of the major creators of deforestation, the pressing need of landless peasants who practice slash-and-burn agriculture. Critics also address the non-binding nature of the agreement, although the effort of creating a framework upon which laws can be created is commended.

The Forest Principles have had their impact on the international scene. The Intergovernmental Forum on Forests (IFF) of 2000, for instance, represents action that has taken place as a follow up to the 1992 Rio Earth Summit. The IFF is a proposal for an international arrangement on forests, including the establishment of the United Nations Forum on Forests (FAO, 2001). The Forum on Forests would include active participation of non-governmental and indigenous peoples' organizations. As observed from the lack of binding principles that protect global tropical forests, the creation of such Forum is extremely important to fill the gap. The recent talk about such Forum is an indication of constructive steps towards the establishment of an international system of forest protection in the future.

#### **4. Mercosul**

In 1991, Brazil, Uruguay, Paraguay and Argentina signed the Treaty of Assunção that established the Common Market of the South (Mercosul). Following the steps of the European Union (EU) and the North American Free Trade Agreement (NAFTA), this agreement sought to achieve the integration of these nations' markets for the benefit of the member nations. The accord primarily focused on matters related to trade, which included the establishment of a free market among member countries, the adoption of a common tariff to non-member nations, and the harmonization of the legislatures in the pertinent issues (Machado, 2002). The Treaty is not an environmental agreement, although the member nations have taken very significant steps in the recent past towards establishing international environmental policy amongst them.

The Accord on the Environment of 2001 signed by the four member nations was an extremely significant step towards environment protection in the region. The Accord reaffirmed the principles of the United Nations 1992 Rio Earth Summit as well as it stated the possibility of implementation of the same principles in the future. The fundamental principles of the Accord include: the protection of the environment and more efficient use of its resources; promotion of sustainable development based on both the economic and the environmental sectors; priority treatment to the causes of environmental problems; promotion of the participation of civil society in handling of environmental issues, etc (Machado, 2002). The Accord presented some progress from past policy that dealt primarily with the impacts of environmental issues by now focusing also in policies that will address the causes of environmental problems. Another important feature of the agreement is the inclusion in the letter of the Accord the need for civil society participation in solving environmental problems. In fact, the Accord determines that the civil society has "obligatory presence" in the solution of such issues. This principle deserves emphasis as it seeks to enforce the integrated approach between layers of society and government in the solution of degradation of the environment.

Although the Accord does not directly address questions of deforestation, it represents a very considerable step in the way of a regional effort to curb the deterioration of the environment. The sheer presence of such an agreement demonstrates the willingness to consider questions of environment protection and sustainable development by the member nations, which can be interpreted as a very constructive step in the battle against deforestation. Because the Accord has been in place for such a short period of time, its impact is yet to be determined. The openness of the member nations during the negotiations to implement the principles of the Accord in the future signals to their understanding of the need for hard law that will regulate transactions among these countries. The Accord presents a very hopeful note to the future of forest protection in South America.

#### **5. Treaty for Amazonian Cooperation**

The Treaty for Amazonian Cooperation (TAC) was signed in 1978 by Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela. This Treaty sought to achieve a balance between economic growth and conservation of the environment. TAC's main goal is to foster collaboration among member countries with regard to policies and activities in agriculture, fisheries, forestry and the environment in the Amazon watershed (FAO, 2001). Although this initiative was very innovative at the time, little if no impact has been witnessed due to the signing of TAC. The Treaty presents a potentially useful coalition that has not been explored to its full capability. New agreements among the member nations should be organized and specific guidelines and funding for projects aimed to restore the Amazon should be determined if this Treaty is to fulfill its potential.

These tools of international policy have been successful at shaping future actions and at spreading information and new ideas. Some progress has been witnessed in the interest taken by the countries that host the majority of the remaining world forests. The deforestation problem is yet to be solved by these non-enforceable principles, and tools such as economic incentives and civil involvement can be used to ensure a broader and more encompassing approach to halt deforestation around the world.

## **VI. World Bank**

Several economic incentives can be used as tools in the fight for the protection of forests in developing nations. The World Bank and its ability to use financial leverage to ensure the money borrowed by developing nations will be used in a manner consistent with the sustainable use of the environment has been considered a valuable instrument in the protection of tropical forests. According to Di Leva (1998), the World Bank has the ability to "impose environment-related instruments such as 'green' loan conditions and environment-related policies as part of their financing activities." Institutions similar to the World Bank may also guarantee the enforcement of international treaties when it is pertinent to their lending policies.

An example of the World Bank's power to act as an enforcer of environmental law is the creation of the Global Environment Facility (GEF), the financial instrument for the United Nations Framework Convention on Climate Change and for the Convention on Biological Diversity (Di Leva, 1998). The GEF provides resources for diverse projects, including those in the Third World that help these nations fulfill their duties according to international agreements and general goals for a better environment. The World Bank also requires an Environmental Assessment of projects funded by the Bank that may have adverse impacts on the environment. Di Leva (1998) points out that although the quality of the Bank's Environmental Assessments has improved substantially in the last decades, more consideration to the impact of projects funded by the Bank on local communities should be included in the Assessments. The World Bank also offers the Inspection Panel, which is an independent forum where citizens that believe they will be harmed by the Bank's projects can voice their concerns. NGOs often bring their positions to the Panel, which aids tailoring the Bank's lending policies.

The World Bank has tremendous potential regarding the investment in environment-friendly ventures, the participation of NGOs in the institution's decisions, and the implementation of international environmental law. While international summits may suggest policies and courses of action developing nations should adopt regarding their forests, the World Bank and similar institutions actually force such nations to take action in order to obtain loans. By opening up the Bank's policies to the participation of NGOs and the feedback of Environmental Assessments, the institution shows a willingness to encourage a more environment-friendly use of its loans. The more recent policies developed by the Bank show a great progress from its history of projects that deeply harmed the environment around the world. Although there has been incredible improvement in the Bank's "green" policies, a large improvement is still expected in the coming years with the increasing participation of the civil society.

The World Bank has been assisting Brazil in its development since 1949 by financing over 240 projects that add up to \$23 billion (World Bank Brazil, 1999). Brazil is the fifth country in terms of lending volume with \$8.9 billion in outstanding loans, and the fourth in number of projects with 66 loans (World Bank Brazil, 1999). According to World Bank Brazil website, the World Bank and the Brazilian government have agreed on three goals of programs funded by the Bank: "poverty alleviation, support for structural reforms

that promote economic growth, and support for fiscal improvements aimed at bringing budget deficits of all levels of Government under control.”

Currently, the Bank is organizing a Second National Environmental Project with the Ministry of Environment in Brazil, which aims at assisting the Ministry in decentralizing management of the environment to state levels (World Bank Brazil, 1999). The project intends to compel states to strengthen environmental policy and management, especially water quality monitoring, environmental licensing, and coastal zone management (World Bank Brazil, 1999). NGOs and the civil society also present extremely useful tools in enforcing existing laws and suggesting new rules regarding sustainable forestry.

## **VII. Civil Society and Non-governmental Organizations**

An unexpected phenomenon has developed in the policing of governments, creating of laws, and inquiring of societal institutions' actions. This development is characterized by the rising of citizen nonprofit organized activity, which is often seen in organized groups such as Non-governmental Organizations (NGOs). According to Anheier & Salamon (1998), NGOs are organized, private, nonprofit-distributing, self-governing, and voluntary. NGOs participate in a variety of actions, which include policy and law making, business and government review, research and dissemination of information, and social change in general. NGOs and civil society challenge the idea of exclusive national sovereignty, allowing instead a resourceful channel through which citizens can participate in environmental law making at a national and international level.

NGOs function in an array of ways in the process of drafting and implementation of international law. Purposes of these organizations encompass bringing weight to minority voices (i.e., Indian tribes and forest dwellers), monitoring environmental impacts of human activities, participating in resource allocation, identifying the relevant international law and environmental issues, monitoring implementation of programs, creating international standards and norms, and enforcing international standards (Alexandrowicz, 1996). NGOs have been extremely instrumental in transmitting information about environment degradation, in lobbying for environmental causes, and aiding in the enforcement of international environmental law. The Internet and new communications technology have created opportunities for individuals to mobilize very large numbers of people with very little need for institutional infrastructure (Gamble & Ku, 2000). Gamble & Ku (2000) explain: “Technology permits NGOs to organize large numbers from multiple sectors, and to do so quickly, empowering NGOs in the international political and international law-making arenas.”

Civil society organizations are generally seen by scholars as an opportunity for social change, however, some believe otherwise. Gamble & Ku (2000) describe the position where NGOs are believed to be threats to national sovereignty especially in nations that “derive their authority by maintaining territorial boundaries to define the reach of their authority.” By questioning restraints of national boundaries, these organizations are considered a threat to the governments of the countries they act within. NGOs, Gamble & Ku (2000) argue, may be used to advance both constructive and detrimental values in society.

Civil society organizations and intergovernmental organizations (organizations that unite the leadership of several nations) have evolved rapidly in the 1970s through the present in the field of forestry regulation. Although most scholars agree the diversity of groups acting in the environmental law making process is a positive sign of a promising new democracy, MacKinlay & VanderZaag (1996) argue that the increased fragmentation of such organizations results in the inefficiency of their actions and in the duplication of their roles. The list of intergovernmental organizations acting as players of international forestry law include development banks, the International Tropical Timber Organization (ITTO), the

United Nations Development Program (UNDP), the United Nations Environment Program (UNEP), the Global Environment Facility (GEF), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and others (MacKinlay & VanderZaag, 1996).

Several NGOs also populate the scene, and they include the "Forest Stewardship Council (FSC), founded in March 1992 by environmental organizations to develop a timber sustainability accreditation program; the Center for International Forestry Research (CIFOR), a non-profit scientific research organization ...to promote appropriate forest technologies; and the United States Forests for the Future Initiative, launched in 1993 inviting partnerships to conserve and sustain forests" (MacKinlay & VanderZaag, 1996). The immense list of non-governmental organizations can be interpreted as confusing and therefore detrimental to the field, or as an exciting and positive new aspect of international law; the truth probably lays somewhere in between. In spite of the ongoing debate, international law will continue to be dramatically influenced by citizen participation allowing for more democratic outcomes in the management of global forests.

Civil society and NGO activity in forest protection is pervasive in Brazil and includes the monitoring of local compliance with environmental law, active representation in international treaties, monitoring of rainforest destruction, and implementation of programs that inform communities on sustainable forestry practices.

The S.O.S. Mata Atlântica, for instance, is an NGO founded in 1986 with the objective of conserving the remaining "Atlantic Forest" (severely threatened rainforest found in the Southeast of Brazil), of educating the community about the importance of the forest, of preserving the communities that depend on the forest, and of monitoring the forest cover. S.O.S. Mata Atlântica has a very effective reporting center where citizens can report actions that breach environmental law protecting the forest. This group provides very accurate monitoring of the progress of deforestation of the area and also offers educational programs to the public. Organizations such as S.O.S. Mata Atlântica fill in the gaps left off by the government in the monitoring of forest destruction.

### **VIII. Pilot Program to Conserve the Brazilian Rain Forests**

The growing international concern over the destruction of the Brazilian rainforest prompted German government to propose at the 1990 summit meeting of the Group of Seven (G-7) in Houston, Texas the development of an international Pilot Program to Conserve the Brazilian Rain Forest or PP-G7, which would have as its main purpose to protect the forests in Brazil as well as to promote their sustainable use (Pilot Program website, 2002). The program was approved in December of 1991, and the European Union (EU), the G-7 and the Netherlands pledged \$250 million to the project with part of this amount being directed to the Rain Forest Trust Fund and later funding to be provided by the participating nations. By request of the G-7, the World Bank was selected to administer the fund and to oversee the projects created and funded by the Pilot Program. The World Bank was chosen because it is an independent institution that has the experience and technical expertise in designing and implementing such enterprises.

Current projects implemented under the Pilot Program follow lines of action consistent with the Program's general objectives. The first line of action is to *test and demonstrate conservation and sustainable development*. Three of the Pilot Program's projects pursue this line of action: Demonstration Projects, Forest Management, and Floodplain Management. The second is to *protect the environment and conserve resources*, with the following projects: Indigenous Lands, Extractive Reserves, and Rain Forest Corridors. The third line of action aims to *strengthen institutions for environmental management*, and has as

its only project the Natural Resources Policy. The fourth line of action intends to *produce and apply scientific knowledge*, and its project is Science Centers and Directed Research. The last line of action proposes to *learn and spread lessons*, and its project is Monitoring and Analysis (Pilot Program website, 2002).

The proposed projects under the Pilot Program work generally the same way and have the same general objectives. The Brazilian government, federal agencies and stakeholders (tribes, forest dwellers) draft projects, which are approved and managed by an Inter Ministerial Coordinating Commissions (Pilot Program website, 2002). Representatives of donor nations, the Brazilian government, NGOs, and the World Bank meet regularly to oversee the progress of the Pilot Program's progress and to offer recommendations (Pilot Program website, 2002). "In addition, an International Advisory Group (IAG) of experts from around the world monitors implementation and provides independent advice and evaluation of the program" (Pilot Program website, 2002).

### **1. Rain Forest Corridors Project**

In order to illustrate the particularities of the Program, the Rain Forest Corridors Project will be outlined and discussed. According to the official World Bank report, the Corridors Project is one of the ten programs proposed under the Pilot Program to Conserve the Brazilian Rain Forest, which currently works with almost \$300 million in grants that make it the largest multilateral donation for environmental protection in a single country (Brazil – Rain Forest Corridors Project, 1999). As preliminary work to the Corridors Project, leading Brazilian biologists defined seven tropical forest corridors; the five Amazonian corridors alone amount to 1.5 million sq. km, an impressive area equivalent to France, Germany, Spain and Portugal combined (Brazil – Rain Forest Corridors Project, 1999).

As defined by the World Bank report on the project, "the corridors are not political or administrative units, but large geographical areas designated for coordinated actions aimed at protecting a substantial portion of biodiversity at the biome level" (Brazil – Rain Forest Corridors Project, 1999). This innovative approach aims at protecting entire biomes by linking protected areas that include indigenous lands and national parks, in an attempt to conserve substantial stretches of forest rather than the former method used by the Brazilian government of conserving an archipelago of isolated protected areas. Two critical corridors were selected to test this pilot initiative: the Central Amazon Corridor and the Central Atlantic Corridor. The general objectives of this program are to conserve the biodiversity of Brazil's rainforests, to strengthen participatory management through the implementation of Corridor Coordination Units, to reduce deforestation in the priority corridors, and to contribute to the protection and sustainable use of the Indian Reservations within the corridors (Brazil – Rain Forest Corridors Project, 1999).

The implementation of the Corridors Project will depend on the participation of the World Bank and donors, the Brazilian government through the Ministry of the Environment, the federal environmental agency IBAMA, civil society, the private sector, municipalities, and selected state governments. The administration units of this program intend to utilize a decentralized and participatory approach by involving local government as well as interested stakeholders (local tribes and communities, NGOs and private sector). Funding is estimated at \$46.5 million, and laying down the infrastructure of the program is projected to take five years, although implementation of the project is expected to be ongoing in nature (Brazil – Rain Forest Corridors Project, 1999).

The World Bank intends to incorporate into the project concepts learned from past experience in implementation of similar programs. These valuable lessons encompass strengthening conservation units, decentralization, engaging new interested groups, developing a strategic policy framework, appropriate design, and project sustainability

(Brazil – Rain Forest Corridors Project, 1999). The local, national and international aspects of this project show a promise for longevity. The emphasis on decentralization and community involvement has proven to be in past enterprises methods that maximize project sustainability and policy enforcement.

The Pilot Program has had some positive impacts on forestry practices in the Brazilian rainforests. In 1998, for instance, the NGO Amazon Working Group (GTA) received a grant from the Program to instruct thousands of small farmers to prevent large-scale forest fires in that year's dry season. Because of its support to NGO action, the Pilot Program has developed a refined network of NGOs, therefore spreading their reach and community acceptance. For instance, the Grupo de Trabalho Amazônico represents 240 NGOs connected with the Amazon that participate in the projects funded by the Program (Aragão & Bunker, 1998). Successes have also been seen in the Extractive Reserves program amongst rubber tappers and Brazil-nut gatherers through their establishment of associations that organize and spread new sustainable technology to the workers.

The Program has brought increased awareness to the indigenous peoples issues and rights, as demonstrated by the 22 million hectares of indigenous lands that have been demarcated by the government. Through Program's grants, the scientific research centers Emilio Goeldi Museum in Belém and the National Institute for Amazon Research (INPA) in Manaus have been able to improve drastically their work conditions and the advancement of knowledge about the forests. Although many accomplishments have taken place, the Pilot Program may fall in disuse with the lack of constant participation from all parties involved.

This project and others similar to it however, suffer the risk that lack of funding and lack of government interest will eventually make the enterprises fail. This risk is most efficiently prevented by deep involvement of civil society, stakeholders and private sector, which will work as watchdogs of government and institutional activity. The Program is in fact a pilot project, and its purpose is to experiment and try out techniques of implementation and policy making. Although the Program is a pilot, the multifaceted nature of it in regards to funding, cooperation, and comprehensiveness of subprojects makes it likely to have positive long-term effects. Even if the Pilot Program does not reach all of its proposed goals, it sets a precedent in regards to an innovative approach to the protection and sustainable use of forests. The project's strongest features are the emphasis on decentralization, community participation, and project sustainability.

## **IX. Market-based Regulations**

Although the alarming rate of deforestation is expected to cause irreparable damage to the planet's environment, scholars generally agree that there is a lack of international forestry law to protect endangered forests. International treaties that establish soft law, or principles that should shape future action, leave much to desire in terms of prevention and control of deforestation. Lipschutz (2001) however, articulates the idea that international forestry law does exist and it is now witnessed in a less traditional form. Lipschutz' argument consists of demonstrating that there is not a complete vacuum of forestry policies in the international arena; rather, he argues, the market place is doing the job governments have failed to address.

The shift from public regulation to market ruled forestry policies is experienced currently, with an emphasis on entities that provide guidelines, research, and certification related to sustainable forestry practices. Some of the organizations that are part of this new wave of regulations and standardization include the Forest Stewardship Council, the International Organization for Standardization (ISO), Scientific Certification Systems, and Rainforest Action Network, among others. The ISO for instance, grants companies the ISO 14000 certification if they pass the standards of environmentally safe practices. The Forest Stewardship Council, a NGO initiated coalition, grants timber certification that ensures forest

products (including timber) were extracted and produced in a sustainable manner and do not harm local communities, in fact, it requires the involvement of forest peoples.

Market-based regulations and certifications are increasing in influence and frequency and these systems may be often the surest way to bring environmentally conscious practices to the private sector. However, command and control mechanisms still are necessary to provide limits and restrictions to companies in order to prevent abuses of the market economy.

## **X. National Environmental Law**

Brazilian environmental law regarding forests addresses a wide range of issues and approaches concerning forest protection. The provisions by law of conservation areas, requirement for environment impact studies, criminal environmental law, and civil action against environmental law infraction are only some of the aspects of the national law of this country. Many of the laws described below partially resulted from very recent action of citizen organizations and international pressures.

In July of 2000, a law was passed that implemented the system of Units of Conservation (UC). UCs are areas determined by law that encompass the rainforest and all of its resources and are designed to fulfill the goals of conservation of the environment, preservation of biodiversity, sustainable use, sustainable extractivism, restoration, maintenance of ecological corridors, among others (Medauar, 2002). The concept of ecological corridors was born from the influence of the PP-G7 and it encompasses the idea that transition areas are needed between UCs so there can be a flux of living beings between the units. The creation of these protected areas derives from both international and national pressure and from the need to systematically protect the rainforest under specific guidelines established by law. Noteworthy is the fact that the PP-G7 has had an influence in law making in Brazil, showing a very significant success in institutionalizing the concepts proposed by this Pilot Program.

Brazilian law also provides for the protection of rainforest under several different nomenclature and conditions that can be very convoluted and repetitive. Areas that are "permanently protected" are another type of protection available for rainforests. These areas serve basically the same purpose of UCs, as well as the preservation of scenic areas or areas of significant beauty (Medauar, 2002). The interesting facet of Brazilian law regarding the protected areas of forests is that the legislation allows in its considerations the sustainable use of the forests by tribes and forest dwellers. Although the Brazilian government is reluctant to admit the existence of the diverse Indian nations within its boundaries, the legislation clearly includes the interests of these communities in its provisions.

Other important facets of Brazilian environmental law that concerns the environment include the required Environmental Impact Assessments and the possibility of civil suit brought by an individual. Similar to American law, Brazilian law determines Environment Impact Assessments should be conducted prior to any large project that can potentially harm the environment. These assessments must be published so as to public access and public comment. These assessments are also required for projects that may cause pollution of any environment type (water, air, and soil). The other interesting feature refers to the fact the environment and all of its natural resources, according to the Brazilian Constitution, belong to the public. Based on this principle, any criminal act committed against the environment can be brought to court in a civil motion. Any person, citizen or not, has standing in Court and can sue a party that has broken an environmental law under the provisions of civil action law. Criminal environmental law is yet another method for environmental protection in Brazil.

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In February of 1998, the revolutionary law 9.605/98 was passed that provided that certain illegal actions against the environment were then considered jurisdiction of criminal law (Medauar, 2002). This law was an attempt to consolidate the fragmented environmental legislation in regards to penalization and categorization of crimes. Among other relevant features, this law was the first to allow the placement of guilt on institutions and companies rather than only on the individual. Prior laws stated that only the individual was accountable for his or her action against the environment. The trouble with the prior arrangement is that low-level employees of large companies would be found guilty while the large company would continue infractions undisturbed. Actions that first were only considered illegal which protected the fauna and flora of rainforests were, under the 1998 law, considered criminal actions.

Some of the several actions considered crimes under this new law include: sale of plant and animal species as well as other forest products without government permission, destruction of forest areas designated as "permanently protected" or as Units of Conservation, initiation of forest fire, extraction of minerals out of forests without government permission, creation of pollution of waterways or of forests, among others (Medauar, 2002). The crimes specified under this law are based on scientific research as well as social and economic considerations. The penalties do not exceed four years in prison, although they include payment of fees and community service. Penalties under this law are aimed at restoring the damage caused by the individual or the company rather than at focusing on incarceration. This law is a very significant step towards forest conservation in Brazil.

The 9.605/98 has had some limited impact on penalizing those who commit crimes against the environment. The most publicized case took place in March of 2002 when seven Swiss citizens were detained by the federal police in an airport in the Amazonas state attempting to smuggle 500 dead rare butterflies, which is in infraction of article 29 of the law (Adolfo, 2002). The individuals would only be released and allowed to leave the country after paying a fee of approximately R\$100,000 (or approximately \$35,000), which is a considerable amount in Brazil. This fee is to be then turned to the IBAMA that will draft a project that will focus on the areas from which the butterflies were collected. The process of such case starts with IBAMA officials detecting the criminals and taking the individuals to Court where the judge defines the penalty. The action of federal judge Dimis da Costa Braga surprised the nation given the rarity to which such crimes are prosecuted (Adolfo, 2002).

Cases such as the one described above give hope to those that believe in the Brazilian environmental law. The current body of environmental law in Brazil is very comprehensive and, if implemented, it would provide a very useful instrument for halting deforestation and for protecting the Brazilian forests. The deficiency in Brazilian law is not on the law itself but on its enforcement. The Federal and State Courts today are severely impaired by the great amount of cases brought on, which delays the process immensely. Another problem is the lack of funding for law enforcement agencies, which results on understaffed agencies that cannot possibly cover the immense stretches of rainforest in the country. Although the laws are in place, there is not enough staff to find the culprits and to prosecute them. The Ministry of the Environment as well as IBAMA receive very low priority in a nation where the major problems are hunger, lack of housing, and health care, as opposed to environment protection.

Official corruption is yet another issue that impedes implementation of environmental law. Corruption is pervasive in countries like Brazil and it reaches all levels of government. Officials receive payoffs to allow illegal extraction of forest materials, illegal smuggling, illegal sale of forest products, etc. The stakes are high given the potential for such great profit, which creates an environment where people are afraid to report environmental crimes lest they will be killed by those that profit from these illegal actions.

Brazilian environmental law is among the stricter in the world. This legislation is comprehensive and it gives weight to scientific research, to the importance of the forest to local communities, to the intrinsic beauty of the forest, to the importance of restoration of damaged areas, to civil initiative, among other considerations. Although the legislation presents an array of possibilities when it comes to forest protection, lack of government funding to enforcement and prosecution of such criminals is substantial. There is hope however that future citizen action and growing awareness to the environmental problem will increase the degree to which these laws come from the books into real life.

## **XI. Discussion**

The research attempted to address the question: What are the mechanisms accessible to developing countries and to the global community that can be utilized to curb deforestation? A further development on the research process focused the research on the Brazilian experience as a way to exemplify how approaches to forest protection work in actuality. The survey of tools to halt deforestation is not limited to Brazil but includes this nation as a channel through each a close critique of the methods could take place. The inquiry referred to the legal and extralegal tools available to the global community to address issues of deforestation nationally and internationally. The techniques comprise of international law and policy, World Bank and economic incentives, the participation of civil society organizations, market-based rules and standards, as well as national environmental law. A detailed description and critique of the Pilot Program to Conserve the Brazilian Rain Forests also took place as this project included several of the successful elements of approaches that seek to fight deforestation in developing nations.

The discussion of the first main technique incorporated an overview of some of the major conferences and treaties, such as the Stockholm Declaration, the International Tropical Timber Agreement, the United Nations 1992 Rio Earth Summit, which drafted the Forest Principles, the Mercosul initiatives, among others. Although the number international treaties addressing forest issues has increased tremendously in the past half century, most of these meetings either fail to draft enforceable law that regulates forestry practices or focus on the trade aspect rather than on the conservation of forests. The Forest Principles, for instance have been criticized for their non-binding nature, although the Principles are still the best set of standards available to be used as reference to lawmakers. The International Tropical Timber Agreement on the other hand, is an accord that has as primary goal the regulation of timber trade between producer and consumer nations. The fact this agreement has as its primary motivation the trade of timber actually works against the efforts for forest protection.

Hard law is necessary because it has the potential to control deforestation rates, to implement sustainable use of forests, to criminalize destruction of endangered species, to ensure the fair distribution of lands to indigenous peoples, and to promote sustainable economic development. The much criticized Forest Principles could be used as a tool in themselves to guide an international forest conference that would set laws and regulations to be followed by all nations, as has been witnessed in the Mercosul's Accord of 2001. Without a forest conference, such as the proposed United Nations Forum on Forests, that brings together developed and developing worlds in a cooperative effort to advance and implement sustainable forestry, the remaining global forests are likely to diminish at an ever increasing rate.

The inclusion of indigenous peoples, forest dwellers, and civil society is of primary importance in the drafting and implementing of international environmental law. Although Mercosul's Accord and the 1992 Rio Earth Summit have taken significant steps towards the inclusion of these groups, the great majority of international environmental accords completely exclude the participation of this sector of society. Agreements such as the

International Tropical Timber Agreement and the Tropical Forestry Action Program represent the blatant failure to include grassroots groups and tribes in the drafting of policies. The inclusion of forest peoples and civil society should be a non-negotiable point in any international environmental agreement, since their participation ensures the policies outlined are humane, realistic, and have the potential to succeed.

International treaties are valuable instruments regardless of their shortcomings. Developed nations can provide the expertise, technology and funding necessary for forest protection. Binding agreements also provide an extra incentive for developing nations to change their national environmental policy. International agreements can also have no effects, as seen in the case of the Treaty for Amazonian Cooperation, in which case only member nations can initiate interest in implementing the principles agreed upon on the treaty.

The second main category encompasses financial tools used by institutions such as the World Bank, which motivate environmental protection. The economic incentives implemented by the World Bank include the lending policies used to ensure environmentally sustainable projects will be developed with the loan taken out and the policies that guarantee that international law treaties will be enforced. The World Bank's enforcement of the rules set forth by the United Nations Framework Convention on Climate Change and the Convention on Biological Diversity through their economic instrument (GEF) represents an instance of how the Bank's actions can make a substantial impact on the degree of efficiency of international law treaties. The Inspection Panel offers a forum to NGOs and concerned citizens to influence the World Bank's lending policies. The Panel is extremely relevant since it allows parties such as indigenous peoples, farmers, fishermen, and other groups directly affected by the destruction of forests, to be heard and to have their ideas shared and considered in the decision making process.

The track record of the World Bank has been blemished by ventures such as Brazil's Transamazonica, which was a highway that was partially built through the Amazon. The Transamazonica highway project failed, causing tremendous destruction to the forest cover and sinking Brazil even deeper into foreign debt. Although the World Bank has a history of funding projects in the Third World that have been incredibly detrimental to the environment, the Bank's latest efforts have shown a growing consciousness and concern for environmental protection. A collaboration between the Bank's own initiatives, NGOs, and international law efforts have pushed the Bank to a new level of environmental protection. The discussed economic tools are very useful, however, the problem of deforestation should be tackled from several fronts, including citizen participation and business initiative.

The third aspect of environmental protection of the developing nations' forests is civil involvement. The world has witnessed the growth of influence of non-governmental organizations at a national and international level. Organizations such as the United Nations Development Program, the United Nations Environment Program, the Global Environment Facility, Forest Stewardship Council, the Center for International Forestry Research, and the Brazilian S.O.S. Mata Atlântica, have been able to achieve great success in information dissemination, in influencing law making, and in representing minority interest groups. Civil society is expected to become even more active and influential partially due to recent communication technologic advances, and partially because of several successes experienced by NGOs. Citizen participation is unquestionably a valuable tool in the fight against deforestation by itself or in conjunction with economic, legal and private approaches.

The fourth tool analyzed that concerns protection of tropical forests is the Pilot Program to Conserve the Brazilian Rain Forest (PP-G7). The Pilot Program is unique in Brazilian forest conservation because it is a partnership between national and international governments, civil society, local community, and the World Bank. This type of initiative coupled with a well developed and fully implemented national environmental law were found

to be the optimal tools to halt deforestation, promote forest protection and restore forest damage that has already taken place.

The Pilot Program unites the best feature of all methods. The PP-G7 counts with the knowledge and financial support of developed nations, which are extremely instrumental features in ensuring the longevity of the project and the use of the latest technology in implementing the program. The Brazilian government is also involved, and its participation is needed in guaranteeing full support to the project, which includes support in the form of policy that aids the project, in the form of full cooperation of governmental agencies and in the form of general public support. The involvement of the civil society and forest peoples, as discussed often in this research, aids the Pilot Program in the drafting and implementing of projects that are realistic and fair to different classes of society. Finally, the contribution of the World Bank is extremely significant since this institution plays the role of a neutral organization with the knowledge necessary to administer the funds and track the flow of the money.

The Pilot Program is relatively new and many of its future trials and tribulations will be instrumental in the drafting of more efficient programs. This approach that uses a multilateral partnership to curb deforestation, which combined with national environmental law, is still the best available tool to curb deforestation in Brazil and other developing nations.

The fifth tool is often used in the private sector and encompasses the accreditation given by independent organizations to companies seeking labels that confirm their sustainable use of the environment. This is an interesting approach to forest protection, especially if ensures logging companies will utilize sustainable forestry practices. Market-based regulations however, are inherently flawed, since they rely on the good will and initiative of businesses that generally depend on the use of the environment to create profit. This type of accreditation is important as it signals a greater interest of both manufacturers and consumers in developing a self-policing method of environmental protection.

The last approach analyzed is the body of Brazilian environmental law. Brazilian law provides for the protection of stretches of rainforests under labels such as Units of Conservation and areas "permanently protected", among many others. These areas are set aside not only for their conservation but also for the restoration of their original condition and for the sustainable use of their natural resources. The concept of protection of these areas is useful because it prevents the sale of the land or the unrestricted use for government projects. The downside is that these areas are so vast and the policing agencies so understaffed that exploitation of these regions often occurs. The pervasive nature of official corruption and the fear of reprisals for people that report forest destruction are also factors that impede the full protection of these forest areas. More funding to policing agencies is desperately needed in order to ensure these protected areas remain intact.

The new environmental criminal codes, or 9.605/98, are the most considerable piece of recent legislation passed in Brazil. Some progress in the implementation of this law has been seen, and more cases of the enforcement of this law should be expected in the future. The comprehensiveness of the law and nature of the punishments are features that increase the probability of success of this law. However, the law cannot be expected to have an impact if funding of law enforcement and of the judicial system does not increase. More officials are needed on the field in order to monitor any violations of the law. More prosecutors and judges are needed in order to ensure that criminals are prosecuted in a timely manner. Lastly, funding for the development of agencies such as IBAMA is needed to allow for the proper restoration projects.

The use of Environmental Impact Assessments and the possibility of civil suit brought against those that harm the forest are also facets of the Brazilian law that can be used to

protect the rainforest. The assessments show the willingness of the government to include environmental considerations in its projects, which is an extremely important step, as it would prevent actions such as building of the Transamazonica highway. The possibility of civil suit is infrequently used, however, it provides yet another channel for initiatives against deforestation.

The analysis of the tools to protect tropical forest has resulted in a number of findings. Common to all approaches is the need for the participation of indigenous peoples, forest dwellers, and civil society in the outlining and implementing of any policy or project to protect the rainforest. The critique of the PP-G7 revealed that the combination of international and national governments, civil society involvement, and World Bank participation is the optimal approach to control deforestation. A partnership that unites several organizations and diverse societal groups maximizes the reach and degree of success of projects that seek to conserve tropical forests. The example of the PP-G7 can easily be extrapolated to other developing nations that usually are in the same position as Brazil. The passing and implementation of environmental law that protects the forest was also found to be of primary importance. Developing nations cannot merely rely on international help to protect their national forests. A well-developed body of legislation that covers the several issues related to forest conservation and sustainable use needs to be in place in order to provide more specific action in the field.

The battle against tropical deforestation is yet to be won. A simplistic approach to this issue will never suffice the deeply engrained problems underlying and driving deforestation in developing nations. A growing awareness of the need for forest protection is likely to further incite several groups to develop even more refined tools to protect tropical forests. Future action must include considerations designing multilateral approaches in order to optimally fight for the conservation, restoration, and sustainable use of the remaining global rainforests.

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## Resumo

As florestas tropicais vêm desaparecendo em taxas cada vez mais altas como resultado da dramática modificação do ambiente natural exercida pelo homem. Uma porcentagem significativa da cobertura de floresta tropical se encontra no Brasil, onde a destruição da fauna e flora se agrava continuamente. É imperativo que o desflorestamento em países do Terceiro Mundo, como o Brasil, seja barrado antes que os efeitos do desenvolvimento, industrialização e crescimento da população sejam sentidos, e as últimas porções de floresta tropical sejam eliminadas do planeta.

Este projeto analisa os métodos para conter a destruição florestal em nações do Terceiro Mundo, tomando o Brasil como estudo de caso, e oferece algumas sugestões para reforma. Quais são as ferramentas legais e ilegais disponíveis para frear o desflorestamento nas nações em desenvolvimento? A legislação ambiental brasileira foi a principal fonte de dados.

Uma análise secundária é baseada em trabalhos de importantes acadêmicos nas áreas do Direito e da proteção ambiental no Brasil e na América do Norte. Os resultados da pesquisa sugerem que uma parceria multilateral, tal como o PP-G7 - Programa Piloto para as Florestas Tropicais Brasileiras -, e a aplicação de uma rígida legislação ambiental nacional são os métodos mais adequados para atingir a conservação das florestas tropicais. As conclusões extraídas desta pesquisa pretendem ajudar na batalha global contra a destruição das florestas tropicais no mundo todo.