

# The MNCs' Role and Responsibility in Deforestation of Tropical Forests

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*Deforestation of tropical forests has significant ecological ramifications. The role played by the multinational corporations (MNCs) in this unprecedented modification of the environment may have foreboding consequences to all inhabitants of the globe. Cattle ranching in Central and South America has accounted for more than half of all deforestation in that region. This article examines the deforestation by MNCs in that part of the world and explores an interactive theoretical framework that can be used to analyze the complex web of political, social, and economic forces related to the phenomenon.*

There is a distinct relationship between a group of multinational corporations (MNCs) and several global events.

- 1) The mass extinction of animal and plant species—5,000 to 10,000 species each year—is the greatest biological debacle since the demise of the dinosaurs and associated species 65 million years ago (Raven 1987; Wilson 1989; Meyers 1990, 1992).
- 2) Significant modification in climatic conditions has meant major shifts in rainfall levels and changes in both average temperatures and temperature extremes (Meyers 1989b; Homer–Dixon 1991; Daniel 1992).
- 3) Acceleration in carbon dioxide content in the atmosphere has led to the addition of 1 to 2 billion tons of carbon to the atmosphere every year. Some experts argue this buildup may have greater ecological consequences than any other man-made event in history (Guppy 1984; Hecht 1986; Marland 1988; Schneider 1989; Daniel 1992; Meyers 1992; Lapidus, Dandurand, and Pinney 1993).
- 4) Reduced national security results from the growing gap between industrialized

and developing countries, compounded by the disproportionate use of resources by the former. The level of environmental contamination by industrialized states also can create acute conflict among the nations of the world (Meyers 1986, 1989b; Homer–Dixon 1991). This article explores these ecological issues and how MNCs have influenced them.

Economic growth and the evolution of an economy to a more advanced level of development necessitate changes and inevitably create conflict. There have been a number of scholarly attempts to chronicle economic development stages and the conflict generated during this evolutionary process (Chenery 1955, 1960; Hoffman 1958; Rostow 1960; Ayres 1962; Kuznets 1966a, 1966b; Chenery and Taylor 1968). Common to all these analyses are the need for investment capital, rapidly expanding demand, increased social and economic expectations of the country's inhabitants, increased public debt, and social and economic unrest in the country. All these conditions have been present in most Central and South American countries during the last 30 years (Browder 1989). Many of the governments in the region aggressively sought foreign investment capital and borrowed extensively in the international money markets to stimulate growth and fulfill the social and economic expectations of the population.

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In an effort to attract investors, Central and South American countries began selling such natural resources as timber, coal, copper, iron ore, resins, gold, and land. The purchase of vast geographic areas by foreigners has had the most significant effect on these countries. The deforestation of the tropical forests of this region may have very serious environmental consequences for the "global village."

To determine how MNCs have affected developing countries' economies, physical environments, and indigenous peoples requires an analysis that incorporates a temporal dimension to investigate the benefits to the developing society relative to other countries in the world, in both the short and long run. Exhibit 1 illustrates the potential effect of deforestation in relation to local and global economies both now and in the future. The greatest benefits of deforestation appear to occur immediately afterward. The beneficiaries of the MNCs' strategy are the local inhabitants who clear the forest, those who work on the ranches, and the local businesses that sell supplies to the workers and MNCs. Experts in economics and ecology consistently project the long-run effects on the both local and global environments to be negative. The consequences of deforestation are long-range and global and will more than likely outweigh the positive, short-run effect of an MNCs' decision to clear the jungle to raise cattle.

Today, the foremost factor in the deforestation of Latin America is cattle ranching (Meyers 1992), which provides hard currency through exports. Many Latin American countries have allowed tropical forests to be felled for cattle ranching. Although this article explores the negative ramifications of deforestation due to cattle ranching, it should be pointed out that ranching makes some positive contributions, as indicated in Exhibit 1. All too often, only the negative outcomes of a strategy are analyzed *ex post*, without examining the initial motivation for, or substantial short-run benefits of, the strategy. A need exists for investment, employment, geographic dispersion of the population, exports, a larger tax base, and infrastructure. Cattle ranching has provided financial stimuli to Latin American

countries to undertake these social and economic programs. The unfortunate long-range ecological consequence of this attempt by Latin American governments to promote economic development is the focus of this article.

Tropical forests throughout the world are being destroyed at an unprecedented rate. World Resources Institute recently estimated that 40 to 50 million acres, or 80 acres per minute, are lost annually (Daniel 1992). Worldwide deforestation has increased by 8% to 9% in the last decade, and some researchers believe the pace is accelerating and could double within another decade (Meyers 1992).

These tropical forests are being destroyed to

- 1) accommodate growing populations in developing countries;
- 2) open land for cultivation, to grow food for increasing indigenous populations;
- 3) provide hard currency, through the export sales of timber, nuts, resins, oils, and pharmaceuticals, to offset international debt; and
- 4) open land for the cattle industry, which in many countries provides employment, a much-needed source of protein, and a product demanded in the world marketplace.

The resulting reduction in tropical forests also has had negative consequences. For example, between 1975 and 1985, 60% of forest destruction was caused by large-scale cattle ranches in Brazil (Daniel 1992). Brazil's Amazon basin contains more than 26% of the world's tropical forests, which contribute 30% of all the oxygen generated on the globe (Marland 1988; Prance 1990; Meyers 1990, 1992; Daniel 1992).

This article addresses the web of events tying MNCs to tropical forest deforestation and an ecological near-calamity in Central and South America by using a theoretical model of social and economic interdependency. The Political Economy Model is a structured means to anticipate the possible conflict among interested parties in the deforestation dilemma. The article also presents options that highlight ways to reduce that conflict. The countries of South and Central America must export to reduce international debt, yet the trend toward more deforestation, with its

EXHIBIT 1

TEMPORAL EFFECT OF CATTLE RANCHING IN CENTRAL AND SOUTH AMERICA

	Short-Run	Long-Run
<b>Local Effect</b>	<ul style="list-style-type: none"> <li>• Attract direct foreign investment (Rich 1990)</li> <li>• Support/build local infrastructure (Rich 1990)</li> <li>• Increase tax base without taxing host nationals (Meyers 1992)</li> <li>• Increase exports (Economic Research Service 1992)</li> </ul>	<ul style="list-style-type: none"> <li>• Degradation of natural resource base (Browder 1989; Ehui, Hertel, and Preckel 1990)</li> <li>• Increased dependence on industrialized economies (Chenery 1955, 1960)</li> <li>• Dislocation of indigenous peoples (Repetto 1990; Burger 1990)</li> <li>• Acceleration in the standard-of-living and use-of-resources gap between developing and developed countries (Homer-Dixon 1991)</li> </ul>
<b>Global Effect</b>	<ul style="list-style-type: none"> <li>• Negative effect on U.S. domestic beef industry (Rifkin 1992)</li> <li>• Increased supply of low-cost beef (Simon 1990)</li> <li>• Increased political stability in developing countries (Taylor 1989)</li> <li>• Reduction in international debt of Central and South American governments (Meyers 1992)</li> </ul>	<ul style="list-style-type: none"> <li>• "Control" of local government decisions by foreign concerns (Binswanger 1991)</li> <li>• Potential build-up of CO<sub>2</sub> (Marland 1988; Benedick 1991; Daniel 1992)</li> <li>• Extinction of plants and animals in global ecosystem (Eckholm 1978; Norton 1986)</li> <li>• Potential effect on global weather conditions (Meyers 1989)</li> <li>• Long-run political instability (Meyers 1990, 1992; Homer-Dixon 1991)</li> </ul>

serious consequences, cannot continue without an examination of the environmental problems that occur when large-scale cattle ranches destroy forests.

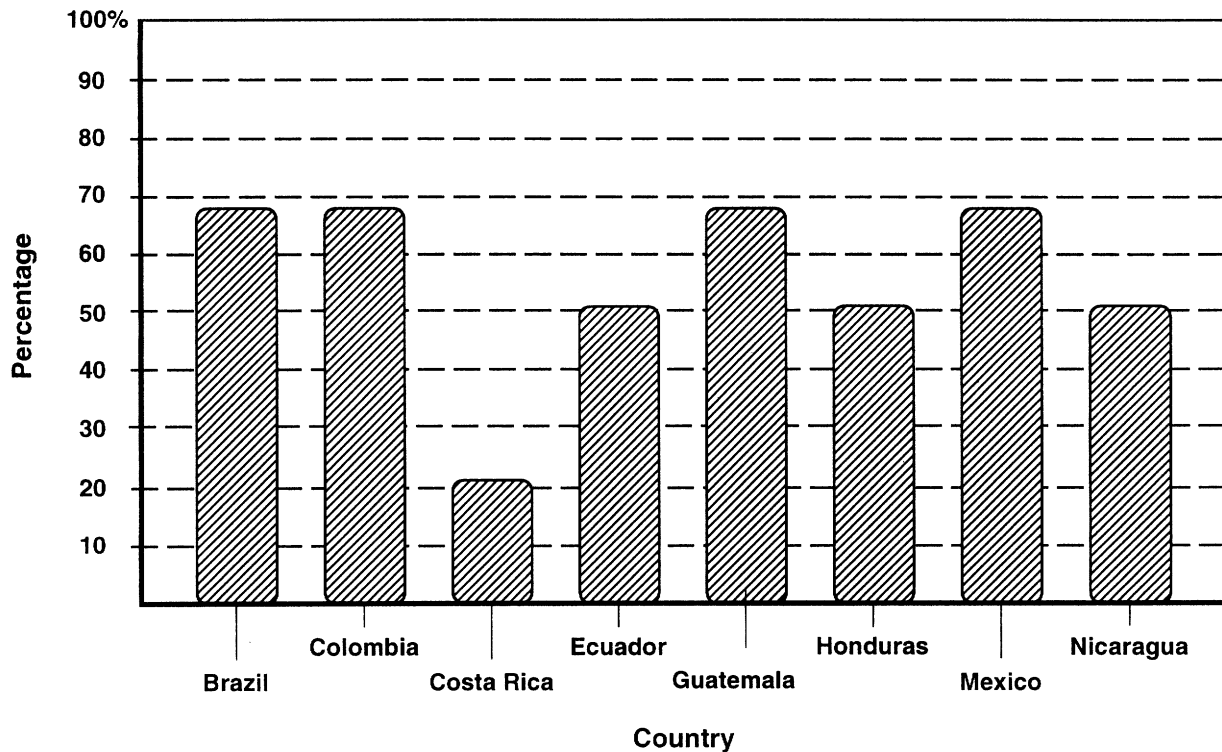
**THE CATTLE INDUSTRY AND TROPICAL FORESTS**

President Theodore Roosevelt spurred the preservation of America's natural heritage 90 years ago when he established several national parks. The reduction of a large percentage of America's forests due to westward expansion yielded high-quality agricultural land that has become the "breadbasket of the world." When this transformation was taking place, little was known of the environmental consequences, nor was the environment a salient issue in the United States at that time. Unfortunately, many Central and South American countries are trying to duplicate this phenomenon. By exporting goods to more developed nations, they are attempting to generate hard currency to repay their national debts. One of the most notable and potentially valuable of

these exports is beef. Tropical forests are cut or burned down, then converted into grazing land for cattle. This beef is then exported to developed countries, including the United States, as cheaper, leaner, and "chemical free" meat available to the fast food consumer. In addition to the irreparable damage occurring in the world's rain forests, there have been disastrous long-term consequences for the American cattle-raising industry because of foreign competition and changes in U.S. investment strategies.

The devastation created by tropical deforestation is well documented. The primary rain forests of the world are located in Central America and the Amazon Basin. Estimates are that 10% to 15% of the Amazon tropical forests have been felled by projects of little long-term gain, such as temporary cattle pastures (Prance 1990). In 1960, the forests covered more than 526,500 million acres of the earth's surface. By 1976, the area had decreased by almost 40%, to 378,675 million acres (Eckholm 1978). The pace of this destruction continued into the 1980s (see Figure 1), when an estimated

**FIGURE 1**  
**EXISTING FORESTS (1989): PERCENTAGE OF FOREST**  
**STILL STANDING IN 2000 AT CURRENT RATE OF DEFORESTATION**



157,000 square acres were being leveled each year, roughly the land mass of England and Wales combined (Guppy 1984). In Latin America alone, an estimated 20,000 of those acres were cut for cattle raising (U.S. Senate 1986). At the present rate, all rain forests on the planet will be gone by 2057 (Repetto 1990). Figure 1 illustrates that, with the current pace of deforestation, several of these countries will have half or less of their forests still standing in 2000.

Cutting down tropical forests produces dramatically different results from the deforestation of America a century ago. Rain forests contain most of the insect and plant life in the entire world, perhaps as much as 75% of all species (Karns and Khara 1993). As their habitats are destroyed, these species often become extinct, with a unique and sometimes devastating impact on the biosphere (Norton 1986). Species extinction compounds geometrically; once one species disappears, several other species often have problems because of the delicate food chain

among plants and animals within the forest (Erickson 1991). When a habitat is destroyed, it is rare that only one species is affected. The importance of these "lost" species cannot be fully quantified, since the majority of plants and animals have never been identified or cataloged by scientists. Species eradication in the last 20 years has been at a pace never before experienced on the planet, outpacing even mass extinctions at the end of the Mesozoic and Paleozoic eras (Prance 1990). In December 1986, a panel of experts from the National Academy of Science issued a report that stated, "The species extinction crisis is second only to that of a global nuclear war" (*Bioscience* 1986).

In addition to the depletion of species, other problems result from clearing tropical lands. Because of their moisture and foliage, rain forests produce more oxygen than any other part of the biosphere and contain the largest percentage of free carbon dioxide. Cutting down the forests releases carbon dioxide, a major con-



tributor to global warming (Marland 1988), and kills production capacity for oxygen (Southgate, Sierra, and Brown 1991).

The Montreal Protocol on Substances that Deplete the Ozone Layer was adopted in 1987, marking the first occasion on which developed and developing countries agreed on global strategy to address a shared environmental problem. The Montreal Protocol has been ratified by more than 100 nations (Global... 1994). The Earth Summit in Rio de Janeiro in 1992 highlighted world concerns about deforestation and the unabated destruction of Central and South American tropical forests. Aside from the loss of genetic material and the natural food chain in these forests, the dire environmental effects of massive erosion and landscape degradation in the wet tropics will cause a decline in agricultural productivity and, subsequently, a potential population collapse (Schneider 1989; Benedick 1991). Global warming, by increasing atmospheric carbon dioxide, is projected to melt the polar ice caps and cause a rise in sea level (Guppy 1984; Meyers 1989a). While this scenario may seem alarmist, 40 to 50 years may be required before many of the effects of deforestation on the biosphere can be fully measured and understood.

### RATIONALE FOR DEFORESTATION

The consequences of tropical forest destruction seemingly outweigh any possible benefit derived from the cleared lands. If this is so, why is deforestation proceeding at such a rapid pace? The answer lies in a very complex web of relationships among MNCs, foreign governments, tax laws, and short-term economic planning. In the 1960s, the Brazilian government stimulated the rush to cut down the forests by attempting to resettle a portion of its large metropolitan population on deforested land in a governmentally developed capital city, Brasilia. Operation Amazonia, a Brazilian government program designed to convert the world's last great tropical forest into commercially productive land, began in 1966 (Rifkin 1992). This process of deurbanization was pictured as ideal for several reasons. It would deal with the population explosion in the country, provide export

forest products that could be sold for hard currency, allow citizens to grow their own food to reduce imports, and reduce overcrowding in the primary metropolitan areas.

The most significant problem with this scheme was that the deforested resettlement lands were fragile. They could support the forest but were too poor to yield sufficient crops (Marland 1988). When the land became infertile, the settlers simply cut down more virgin forest, leaving devastation behind; for the first time in history, there was dust in the Amazon Basin during the dry season (Cockburn 1989), reminiscent of the deforested "dust blows" of South Central Africa. Coupled with the urban relocation program, the Brazilian government spent \$2.5 billion subsidizing cattle ranchers through long-term loans, tax credits, and other fiscal incentives. Ranchers who cleared the trees of the tropical forest in the Amazon for their pasturelands did not bother to market the timber, torching \$5 billion worth (Barber 1990; Meyers 1992).

Brazil and other nations in South and Central America have encouraged the destruction of their rain forests as a license to generate public funds (for detailed discussion, see Allen and Barnes 1985), believing they could harvest the forests for the value of the timber and use the cleared land to support beef cattle, thus turning a "worthless" jungle into a perpetual money enterprise (Binswanger 1991). Unfortunately, not only is the land reclaimed from the jungle wholly unsuitable for these purposes, the process is extremely wasteful and destructive. From 96% to 98% of the timber products are wasted or uneconomical to harvest (Ehui, Hertel, and Preckel 1990) and so are burned to clear grazing land. To produce enough ground beef for one hamburger patty, almost 55 square feet of rain forest are destroyed (Uhl and Parker 1986). Recently, Brazilian President Fernando Collor de Mello signed a landmark decree to halt deforestation in the 13 states encompassing Brazil's Atlantic Coastal Forest (Daniel 1992).

The tragedy of the clearing process is that, in a relatively short time, the land loses the nutritional means to support any livestock or wild game. Perhaps only 10% of the lands on which forests grow can sustain any long-term

agricultural production (Guppy 1984). Significant supplemental feed and unrealistic grazing patterns are required to raise cattle on land that abuts a tropical rain forest.

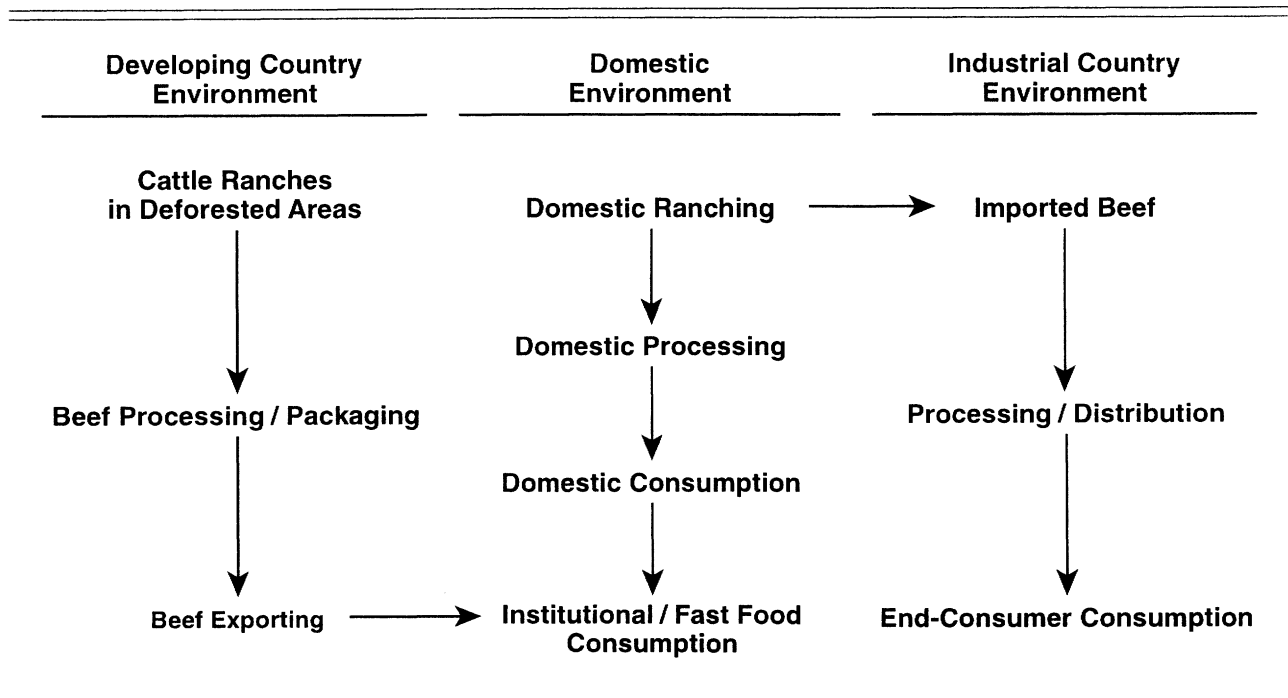
### MNCs' PRESENCE IN TROPICAL FORESTS

In an effort to stave off the economic decline and investment slump in the domestic cattle industry, many domestic corporations have increased their involvement in foreign cattle production. Figure 2 illustrates that beef raised on ranches in Central and South America is primarily for export to developed countries. In Latin America, more than 70% of the beef raised and processed is exported (Economic Research... 1992). In the United States, this imported beef is sold almost exclusively to fast food chains or to institutional buyers for processing; domestically produced beef is sold to both U.S. consumers and other industrialized nations, such as Japan and European countries (Uhl and Parker 1986; Rifkin 1992).

Who are the owners and ranchers who raise the cattle, and who are the primary pur-

chasers of this beef once it has been processed? To foster the cattle ranching sector, the Brazilian government offers many incentives to MNCs (for a detailed discussion, see Binswanger 1991). Between 1966 and 1983, more than 140,000 square miles of forest land in Brazil's sector of Amazonia were converted to cattle pasturelands operated by almost 350 foreign-owned MNCs (Meyers 1992). An increasing number of the ranches are foreign owned. A U.S. consortium of the Brascan-Swift-Armour-King ranch holds more than 1,010 square miles in this region. Other U.S. companies that own part shares in ranching enterprises are suppliers to cattle producers; these include Caterpillar, Beltec International, Dow Chemical, Massey Ferguson, W.R. Grace, Anderson-Clayton, Gulf and Western, and Goodyear. MNCs headquartered in countries other than the United States are also heavily involved in raising cattle in Central and South America, purchasing land to permit cattle production or deforestation for future cattle operations. Among these are Mitsui, Tsuzuhi, Marubeni (Japan), Liquigas (Italy), De Buis (Switzerland), George Markhof (Austria), and Volkswagen (Germany).

FIGURE 2  
INTERNATIONAL CATTLE TRANSACTIONS



The cost of beef imported from Central and South America is half that of beef produced in the United States (Hecht 1986). Cattle raised in Latin America are not fed grain, which reduces the fat content and makes the beef ideal for multiple segments in the U.S. economy. According to the Meat Importers Council of America, virtually all this imported beef makes its way into hamburgers, frankfurters, chili stew, frozen dinners, baby foods, luncheon meats, salami, and other processed meats for humans and provides by-products for pet foods (Meyers 1992). Imported beef is one of the largest and fastest growing segments in the domestic food market. In 1991, the value of such products from Latin America was \$420,200,000 (Economic Research... 1992), and demand will continue to grow well into the next century, due to the relatively low price. Clearly, the MNCs, the cattle industry, and U.S. consumers are contributing to what environmentalists term the "hamburgerization" of the tropical forests in Central and South America.

#### **A THEORETICAL FRAMEWORK FOR ANALYZING TROPICAL DEFORESTATION**

To help define the multidimensional issues associated with deforestation, a theoretical framework is necessary to provide a superstructure for systematic analysis. To this end, a conceptual model has been chosen to analyze intra- and interorganizational power and influence at both the micro and macro levels. The Political Economy Framework, which focuses on how sociopolitical and economic decision making influences complex issues, takes a system resource view of government and private organizations. As opposed to simple cause-and-effect mechanisms, the model examines complex socioeconomic interrelations and multilateral interactions (Stern and Reve 1980). The analysis delineates patterns concerned with both actual performance and the processes of resource distribution and acquisition (Benson 1975). It links the intraorganizational network to the larger environment of authorities, legislative bodies, bureaus, and publics. This framework is particularly applicable

to complex global issues that necessitate multiple levels of analysis to determine plausible strategies to resolve problems (Benson 1975; Stern and Reve 1980).

The basic global framework model, shown in Figure 3, illustrates the interrelationships among internal and external issues and the interdependence of economic and sociopolitical concepts. The model is well suited for developing an interactive solution to deforestation because it

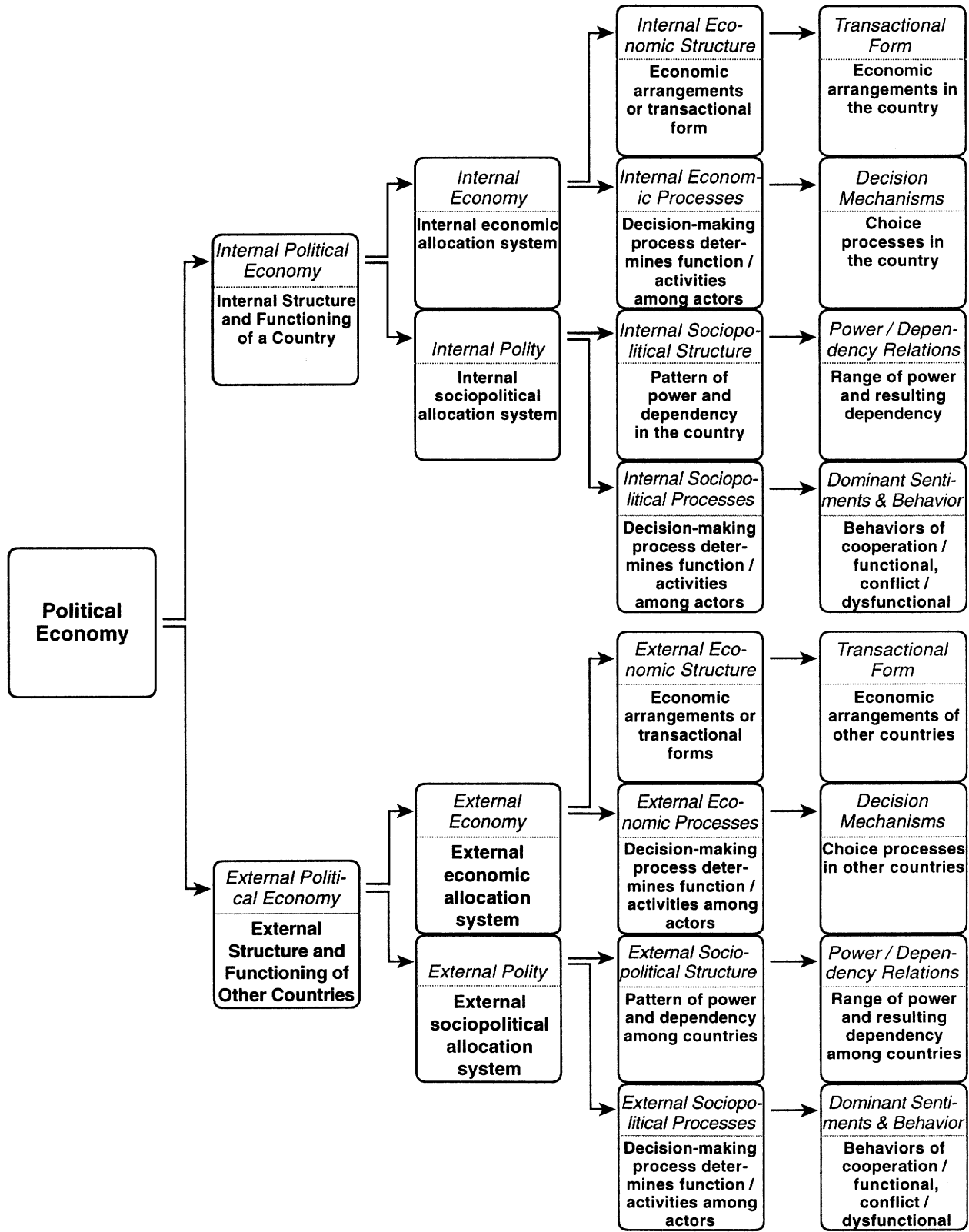
- 1) can be used to analyze both internal and external economic and political inputs to decision making;
- 2) allows multiple parties to become involved in a proposed solution;
- 3) focuses on both the micro and macro levels;
- 4) identifies the relationships among economic and sociopolitical issues; and
- 5) allows for a dynamic analysis, for example, modification of one dimension and its effect on other aspects of the model.

This basic framework will be employed to illustrate how the model can be applied to the complex social, political, and economic dilemma described in this article.

Governments, the United Nations, and conservation organizations have offered various suggestions for preserving the tropical forests and minimizing the human effect on them:

- 1) Reforestation of the original flora and fauna with species that have commercial value (Daimon 1991);
- 2) Implementation of farm, social, and community forestation programs in rural areas to avoid progressive deforestation (Muri-Levesche 1989–1990);
- 3) Sale of fruits, nuts, oils, and pigments, with the assistance of indigenous people, to discourage deforestation (Whittemore 1992);
- 4) Creation of large conservation areas and restoration of sustainable timber plantations in deforested areas (Prance 1990);
- 5) Creation of environmental zoos in tropical forests to attract visitors, to provide a source of income and increase public awareness of deforestation and other ecological problems (Karns and Khera 1993).

**FIGURE 3**  
**GLOBAL POLITICAL ECONOMY FRAMEWORK**





The flaw in each proposal is that it does not incorporate multiple constituents in the solution. Each takes the perspective of one of the interested parties. If deforestation is to be addressed effectively, all entities involved in the elimination of forests for cattle ranching need to be incorporated into the overall solution.

As shown in Figure 4, the Political Economic Framework is an interactive model that seeks to assess the conflicting expectations that surround deforestation among the five interested constituents: the host government(s), the U.S. government, meat and livestock associations, MNCs, and the United Nations. While action by any one of the participants is better than no action at all, preventing the deforestation of Latin America's remaining forests is unlikely without cooperation among all of those involved. Many of the policies recommended are long range, recognizing that there is no "instant fix." Illustrating the cooperation and coordination of change necessary among several participants underscores the complexity of the problem and the level of action required to reverse the current trend.

The alternatives presented are not to be construed as a specific solution; rather, they illustrated how the Political Economic Framework can be used to address complex macro issues. The following discussion is organized around the five entities involved. The contribution each can make is identified in terms of the various categories of action defined in the Political Economic Framework.

### **The Role of Host Governments**

Host governments in Central and South America have encouraged domestic and foreign companies to develop the tropical forests and convert the land for the reasons mentioned earlier. Tax incentives, import incentives on equipment, training allowances, and other governmental assistance has been provided for logging and clearing for crop production and cattle grazing. It should not be forgotten that a primary motive of some governments, such as Brazil, is to relocate substantial portions of the crowded urban population.

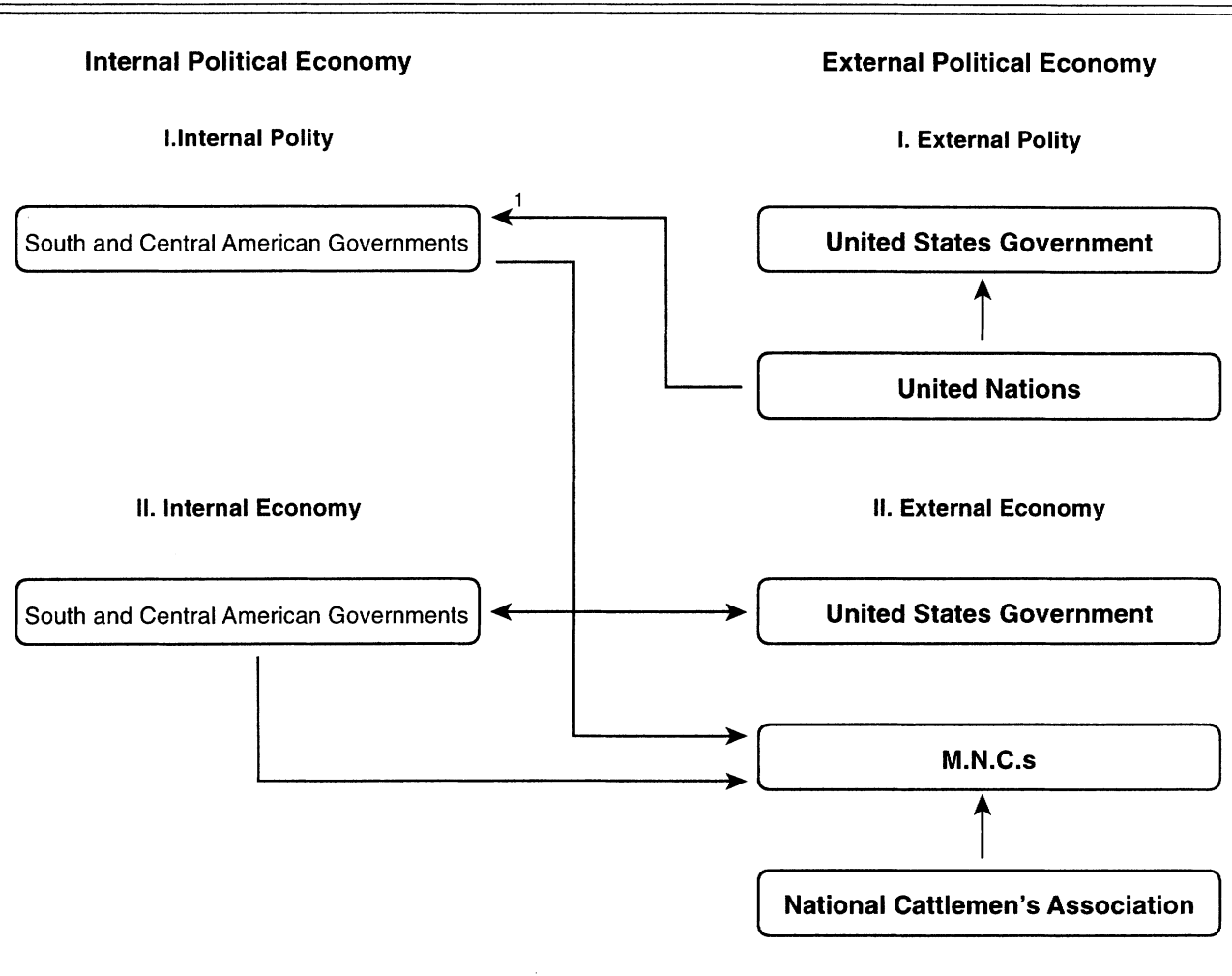
The need for economic and political stability remains a vital issue in Latin America today. A gradual movement toward environmental awareness and policies that recognize the national global consequences of decisions is essential. Therefore, host governments play a key role in any interactive solution to deforestation. The leaders of these countries must be willing, not only to participate in the program, but also to modify present policy and adjust their perspectives on the value of the tropical forest relative to other economic and political issues their countries face. Figures 3 and 4 illustrate the following five options pertaining to the host country government internal polity and economy.

#### ***Reduce Incentives to Industry (Internal Economic Processes → Decision Mechanisms)***

One proactive step would be to modify current policies and programs that encourage deforestation. In 1991, the Brazilian government made a positive and creative decision to allow foreign financing of Brazilian environmental projects and abolish tax subsidies that made it profitable to cut down Amazon rain forests for farming and ranching (Daniel 1992). (Many past incentives had promoted continued relocation and additional deforestation, as the original cleared land quickly lost its productive mineral content.)

New programs should focus on reclamation and sustainability of deforested areas over time. They should encourage agro-forest integration that permits a critical mass of the forest to remain and encourages agricultural crops to be grown among and around the remaining "patches" of forest. In some situations, for example, fruit trees are interplanted among manioc. The actual mix of cultigens varies with local farmers' preferences and the availability of planting stock (Browder 1989). The Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) and its Tree Crop Project have developed both an innovative, multidisciplinary agro-forestry strategy to transfer tested species and techniques for growing multipurpose trees within the framework of farmers' needs and the potential of their land use sys-

**FIGURE 4**  
**INTERACTIVE ANALYSIS BASED ON THE POLITICAL ECONOMY FRAMEWORK**



<sup>1</sup> Lines and arrows indicate the direction of influence.

tems (Reiche 1989). In addition, those reforestation projects to be conducted by MNCs. With the advent of genetic engineering and means to enrich depleted deforested land, the growth of the next generation of tropical forests may not take 50 years. Environmentally concerned governments need to provide incentives to invest in research and development to accelerate the growth of new forests. Brazil, for example, has submitted a proposal for funding \$1.5 billion for forest conservation and reforestation (Daniel 1992). Cooperative funding among the host governments, MNCs, the U.S. government, and the key trade associations should not be considered too farfetched. If one concludes that the "rich nations" are the major contributors to rising carbon dioxide levels, re-

Host government incentives, such as research grants and deforestation-supported tax incentives for environmental programs, should be directed at scientific research on grand-

scale reforestation projects to be conducted by MNCs. With the advent of genetic engineering and means to enrich depleted deforested land, the growth of the next generation of tropical forests may not take 50 years. Environmentally concerned governments need to provide incentives to invest in research and development to accelerate the growth of new forests. Brazil, for example, has submitted a proposal for funding \$1.5 billion for forest conservation and reforestation (Daniel 1992). Cooperative funding among the host governments, MNCs, the U.S. government, and the key trade associations should not be considered too farfetched. If one concludes that the "rich nations" are the major contributors to rising carbon dioxide levels, re-

ardless of whether there is a “greenhouse” effect, these same nations should be willing to contribute to rapidly growing, insect-resistant forests in Central and South America.

**Require Land Use Proposals**  
**(Internal Sociopolitical Processes**  
**-> Dominant Sentiments and Behavior)**

One way to reduce conflict between economic growth and the ecosystem is to have land use proposals submitted to the host government when projects are first generated. To stem the rate of deforestation and the abandonment of cleared forest, the government could require land use and reclamation plans that could be classified by the level of remediation that the MNC is willing to undertake. For example, in a prime location that could support cattle ranching for a longer period, the MNC might be willing to invest more than in marginal property.

Companies would be required to establish a timeline for development, and the environmental impact of each project would have to be assessed before governmental approval would be given (Browder 1989). These land use proposals would be performance benchmarks to which the host government could hold MNC executives as development proceed. Unless there is this kind of corporate commitment to the total project, including the reclamation phase, the host government may not be able to enforce any *ex post* claims on the MNC. In addition, if land use proposals were submitted before rights were granted, governmental officials could evaluate a number of them from both economic and environmental perspectives and choose the most beneficial.

Perhaps better decisions would also be made concerning economic development, the long-term welfare of indigenous people, and the consequences to their environment. Environmental shifts caused by deforestation threaten the welfare of a number of indigenous peoples in Central and South America, including the Guaymi in Panama, the Gunmbiano and Pae in Colombia, the Yagua in Peru, and the Yanomami and Apinaye in Brazil

(Burger 1990; Lean, Hinrichsen, and Markham 1990).

Political reality in developing countries may preclude requiring detailed land use proposals, but the mere request for environmentally responsible behavior alerts MNCs to the social significance of the issue in the host country. The time needed to prepare proposals could slow the process of deforestation, but it also could negatively affect the host government's acquisition of direct foreign investment.

**Require Reclamation Proposals (Internal**  
**Economic Processes -> Decision Mechanisms)**

Many host governments have been so eager for development in “unproductive” tropical forests that they have not required the simplest forms of reclamation. Particularly in the case of logging and cattle ranching projects, the cost of remediation and the need to address environmental issues should be part of the return-on-investment calculation made by the MNC.

There are many ways to address the environmental impact of industrial projects. The U.S. standard of “total” reclamation—returning the land to its original use and condition—may not always be necessary in developing countries, but remediation should reduce the probability of future damage to the site. For example, hazardous materials used during development should be removed so that they do not contaminate ground water or air or harm unknowing persons (for additional discussion, see Haun 1991).

Reforestation is a primary example of realistic reclamation projects that can replenish the renewable assets of the tropical forest. If MNCs are aware of these obligations before undertaking a project, the rate of deforestation might decline. It should not be assumed that development and conservation are directly in conflict. According to the Development Strategies for Fragile Lands (DESFIL) project, the environmental community increasingly realizes and accepts that conservation and economic development must be complementary if indigenous people are to benefit (Browder 1989).

***Coordinate with the Importing  
Country (Internal Sociopolitical Processes  
→ Dominant Sentiments and Behavior)***

The host government could gain a significant advantage when dealing with the MNC if it would communicate more closely with the corporation's home government. The host government could gain insight into the present and past corporate citizenship of the MNC and use the company's history in its domestic environment to predict its behavior in the host country. It should not be assumed that the MNC will behave exactly as at home; rather, past behavior can serve as an early warning signal and as a "model" of expectation for its behavior in the host country. General corporate tendencies regarding pollution, OSHA violations, discriminatory personnel practices, and so forth, are likely to be transferred to the host country. In other words, corporate personality and values can be expected to operate in new geographic regions almost without regard to local legal constraints.

The appropriate linkage may be with the home government's department of commerce or agriculture. A mechanism similar to the INTERPOL network could be devised to alert governments negotiating with MNCs and might promote more consistent behavior by MNCs throughout the world. Obviously, responsibility for the network would be shared between host nations and home governments. While the information would not predict with certainty how the MNC would behave in the host country, it could be useful in negotiations about incentive packages, land use plans, and reclamation proposals.

***Establish Tax Sharing on  
Imported Products (Internal Economic  
Structure → Transactional Form)***

An import tax placed on products from deforested lands sold in the United States could provide the funding base for reclamation projects. An import tax on oil from foreign countries has been debated for the past 10 years. A tax on cattle, lumber, and minerals could be re-invested in environmental projects. Instead of

an export tax from the host country, an import tax should be used, so as not to reduce demand for their products in developing countries that, for example, need beef to feed their growing populations.

The host government could use a portion of these tax revenues as "seed funding" for reclamation projects on past environmental disasters created by clearing forests. The funding could provide the stimulus for local organizations to play an active role in the control of deforestation and development, thereby achieving greater political and economic leverage at the local level (Honadle and VanSant 1985). It also could be used for up-front incentives to MNCs during the development of their land use proposals. The funds would help ensure cooperation and commitment to the reclamation deemed necessary before project approval by the host government. This tax could replace the tax incentives and import tax deferrals presently given to attract investment in tropical forest areas.

One possible problem with this "shared taxation" concept could be state sovereignty. Developing nations are reluctant to enter arrangements that can be dominated by the U.S. government, in part because of its great size. Hypersensitivity concerning sovereignty exists many countries of Amazonia, most particularly Brazil, although Colombia and Peru are also seeking to assert sovereignty over parts of the region by moving many people into the territory (Meyers 1992). Therefore, outside interference by the United States through shared taxes on imported products may be difficult to accomplish.

***The Role of the United States Government***

The United States not only needs to work in concert with the host government, but also should undertake legislation and public relations to raise domestic consumers' levels of awareness of the implications associated with imported products from tropical forests. The following five options pertain to the federal government and external polity and economy, as illustrated in Figures 3 and 4.



**Require Disclosures to Domestic Consumers (External Economic Processes → Decision Mechanisms)**

To heighten awareness of the origin of beef products, current importation documentation needs to be modified. At present, beef imported into the United States is inspected by the USDA, then loses its foreign identity. Retail consumers should be made aware that fast food franchises almost exclusively use imported beef. This requires new identification procedures. Increased consumer consciousness is essential in influencing the MNCs. Public citizens' support for tropical forests is essential and can be marshaled only if people are informed. In 1985, the Rainforest Action Network was the lone voice in the campaign against the acceleration of deforestation in Central and South America. Today, there are nearly 200 groups in the United States, Great Britain, Germany, Holland, Sweden, and a number of other countries.

Fast food companies should be required to inform consumers of the foreign beef content of their products at the retail level. While not all imported beef comes from deforested regions, retailers might have to identify their sources and defend their use of imports to satisfy consumers. Awareness of the issue among large groups of customers and other stakeholders could affect the MNCs' environmental strategies throughout the world. Consumer awareness may not translate into an immediate reduction in the consumption of imported beef, but over a longer period, a reduction could occur, as in the case of cigarettes in the United States.

**Influence World Bank Funding of Tropical Forest Projects (External Economic Structure → Transactional Form)**

Undeniably, one root cause of the accelerated tropical deforestation in the 1980s lies in the loan policies of the World Bank, which financed many of the deforestation and development projects (Rich 1990). A change in those policies requires much more than simply limiting loans to nonranching projects; in many countries, all facets of industrial development

affect the rain forest. For example, infrastructure development invariably encourages deforestation by making the jungle more accessible to growing populations. Infrastructure loans are not inherently bad, but they do encourage poorly conceived projects that ultimately contribute to deforestation. Furthermore, the World Bank should recognize that repayment schedules for developing countries can necessitate deforestation as the only means to pay the debt (Rich 1990). Altering these schedules would assist Central America and Brazil, which are forced into selling land, timber, and minerals because of their debt burdens.

**Establish Allowable Content Quotas of Imported Beef in Select Product Classifications (External Sociopolitical Processes → Dominant Sentiments and Behavior)**

Rather than set import quotas, which would reduce the market for imported beef, the USDA could mandate the allowable percentage of imports in certain processed and ground meats. This restriction would not impede free trade but would restrict one of the primary product categories open to imported beef.

To limit the amount of imported beef in ground and processed meat, the USDA would have to identify imported beef beyond the initial import inspection point. Presently, the USDA is involved only when inspection takes place or if there is a health issue. The USDA should proactively address the imported beef issue and develop a program designed to increase consumer awareness about the global significance of imported beef, ultimately affecting purchasing choices. Major franchise chains then might rethink their almost exclusive use of imported beef. If these two avenues of use for tropical beef were diminished, the need to continue deforestation might decline.

**Support Debt-for-Nature Swaps (External Economic Structure → Transactional Form)**

Developing countries that owe heavy debts to the world banking community frequently are willing to swap their debt for forest acreage. The lending institutions could offer debt notes at a

small fraction of their face value. An environmental organization, typically backed by a private philanthropist, will buy the debt and exchange the note for tropical forest. Several such swaps have occurred in Costa Rica, Madagascar, the Philippines, and Brazil (Daniel 1992).

Sir James Goldsmith envisions an international company that would finance transactions as large as \$50 billion to write off debt owed by the developing countries. The debt would be sold to environmental and conservation organizations at a fraction of its value, and these dollars would then be invested to protect forests in developing countries (Meyers 1992). In the past, loan forgiveness by the U.S. government was viewed as an invasion of state sovereignty and created significant political tension between the United States and the developing country. In this proposal, a third party or organization would ultimately control the nature swap. The U.S. government could help underwrite the conservation measure without expending dollars. Rather than write off debt or hold obligations that would not be repaid, the federal government could help finance the World Wildlife Fund with this "soft" money. While hard currency is not obtainable in the form of debt repayment, many governments might want to dispose of their obligations in this manner. The end result would be the creation of wildlife preserves and protected tropical forests, owned and managed by environmentally oriented citizens' groups. Nevertheless, several countries object to this in-kind "repayment" plan as an infringement on their national sovereignty by surrogate representatives of the United States.

The U.S. government could play a significant role in stimulating this concept if it were to tie future foreign aid to a reduction in debt level. Countries would have to illustrate good faith debt-for-nature swaps or repayment before being granted additional aid. In 1992, the Brazilian government took a proactive step by announcing plans to create a \$100 million fund for the environment through debt-for-nature swaps (Daniel 1992).

***Financially Support "We Are All in It Together" Committee  
(External Sociopolitical Processes  
-> Dominant Sentiments and Behavior)***

The forest remaining in the Amazon Basin represents one-third of the tropical forests remaining in the world, and it has been estimated that \$20 billion a year will be needed to offset the economic benefits from continued deforestation of the Amazon (Meyers 1990, 1992). The United States should not "rent" the Amazon for an annual fee, yet what would be the positive impact if the U.S. government, as part of a coalition of countries in the world community, initiated protection of the tropical rain forests? If the greenhouse effect is a reality, as many believe, the cost of combating the rising temperatures around the globe will surely be more than \$20 billion. An "insurance policy" against this potential environmental threat deserves a thorough investigation. The U.S. government's position at the Earth Summit in Brazil has been ridiculed by many observers. What better way to take a positive environmental position than to be a founding member of a worldwide "We are all in it together" committee?

**The Role of MNCs**

Many critics, particularly environmentalists, place most of the blame on MNCs for the rampant destruction of tropical forests, but these corporations usually were following the actions of local companies and responding to the incentives provided by the host government. MNCs might choose to follow a different agenda, such as the interactive solution proposed herein, as global consciousness is elevated regarding harm to the tropical forests and possible consequences to the world ecosystem. MNCs that want to succeed in both the host and home countries will modify their strategies to be environmentally acceptable. The following three options pertain to the MNCs external polity, as illustrated in Figures 3 and 4.

**Exercise Better Corporate Citizenship  
(External Sociopolitical Processes  
-> Dominant Sentiments and Behavior)**

Although corporations today conduct business in foreign markets under different corporate charters than apply in the domestic marketplace, MNCs will be compelled to develop a more consistent and high level of global citizenship as consumers become more knowledgeable of their place in a true "global village." The motivation to enter markets may be reduced labor costs, cheaper raw materials, less competition, or minimal legislative restrictions. Each of these is a valid motive for expanding into foreign markets, but corporate strategists will not be able to ignore the possible repercussions of their environmental laxness in certain markets in which they operate (Lanier-Graham 1991). Consumer dissatisfaction, social unrest, and autocratic conservative political reaction exemplify the likely negative reactions to MNCs that are not sensitive to environmental concerns. A strategic window of opportunity is open to environmentally attuned companies (Dandurand, Lapidus, and Pinney 1993). One can argue that MNC management must integrate a social, as well as economic, conscience in host market operations. Local regulations may not dictate sound environmental policies, but the corporation should examine its strategies in light of future expectations.

**Allocate a Portion of Beef Production  
to Benefit Indigenous Populations  
(External Sociopolitical Processes  
-> Dominant Sentiments and Behavior)**

One way to improve corporate citizenship in developing countries would be to initiate programs to help feed the indigenous population. While cattle production has been increasing dramatically in both Central and South America, beef consumption in these countries has been declining. The reduction in animal protein consumption is attributed to fact that the vast majority of people in most Latin American countries do not own land. The new cattle ranches belong to wealthy families or MNCs, and the beef is exported (Meyers 1992).

The decline in local beef consumption should not be ignored by MNCs wishing to remain in Latin American countries. They should consider programs to integrate inhabitants into the cattle raising and processing system. The initial involvement of the local population may be minimal in the early stages, but over time a tradition of working in the industry could evolve. What is envisioned is not a "free beef" program, but an effort by ranchers to allocate locally grown beef for local marketing at the prevailing local price, ensuring a level of supply.

It is unrealistic to assume that any single program will eliminate cattle ranching by foreigners in Central and South America, but the proposed strategies would slow the rate of tropical deforestation. The large MNC cattle ranchers should encourage local residents to become suppliers to their operations, since MNCs that isolate themselves are never thought of as a part of the local business and social community (Honadle and VanSant 1985; Browder 1989).

MNCs must exercise good corporate citizenship in developing economies. The lack of locally available beef and its high cost to local consumers exacerbates the relationship between MNCs and the countries that are the bases of their success.

**Develop a Branding Program for Beef  
Products (External Sociopolitical Processes  
-> Dominant Sentiments and Behavior)**

Establishing consumer awareness of beef products through brands is a strategy that would help differentiate domestic and foreign beef in the United States. Brand promotion and communications could describe the differences between domestic and imported beef products in terms of the issues discussed in this article. Branded domestic beef products with a favorable consumer image would be purchased by wholesalers and retailers who want to market merchandise most acceptable to shoppers. Recognizing the lack of identity for domestically produced beef, the industry has concentrated its efforts in the 1990s on marketing the image of beef products.

The more meat is branded, the more it will become differentiated in the consumer's mind.



Consumers could begin to make purchase decisions based upon characteristics of branded domestic beef, as opposed to those of unbranded imported beef. Eventually, this strategy is likely to make it more difficult to sell imported beef to certain consumer segments, such as the environmentally aware shopper. In the resulting competition for market share between imported and domestic beef, the issues surrounding tropical deforestation would become known. In addition, the higher prices for American beef would be absorbed by the consumer's choice, rather than mandated by the industry or government. Some evidence exists that consumers are willing to pay higher prices for products perceived as higher in quality (*Supermarket Business* 1987).

Finally, the beef industry could initiate a branding campaign of its own by labeling domestic products as "Made in America," or something similar. The conspicuous absence of such a label could potentially hurt foreign competition at the retail level. The industry would do well to examine the way the National Dairy Association established and promoted its "Real Seal" campaign, designating real dairy products to differentiate them from imitations. Despite the expense of a compliance monitoring system, such a campaign could be highly cost effective. Enforcement of such a program could be supported by the National Cattlemen's Association and conducted by the National Livestock and Meat Board, whose mission is to promote meat to the consuming public.

### **Role of the United Nations**

A third party to the problem of deforestation is the United Nations. Their past efforts on the part of the global environment have been highly successful, but in some cases they were not included as a member of the team attempting to resolve environmental issues. Typically involved only after the problem occurred, the United Nations has had little effect in stopping potential environmental problems. Its role in an interactive solution to deforestation primarily would be as the bank for other members of the team and as a check-and-balance to more directly interested parties. The

following three options pertain to the United Nations and external polity and economy, as illustrated in Figures 3 and 4.

#### ***Convene a Global Forest Convention (External Sociopolitical Structure -> Power/Dependency Relations)***

The United Nations should take the lead in an annual Global Forest Convention. With the recent visibility of the Earth Summit and the heightened debate over ozone deterioration, global warming, and pollution in Eastern Europe, the time is right for a standing environmental forum. Although there have been numerous ad hoc gatherings, there is no ongoing body to study issues, recommend policy, and, to a degree, serve as an environmental watchdog.

The Global Forest Convention would invite MNCs, trade associations, and all member nations. This forum would allow participants to conduct longitudinal research, exchange methods for controlling environmental problems, suggest effective governmental incentives for economic development and environmental compatibility, and exchange information on the conduct of MNCs in individual countries.

#### ***Manage Debt-for-Nature Swaps (External Sociopolitical Processes -> Dominant Sentiments and Behavior)***

The United Nations could provide a valuable service to developing countries and organizations, such as the World Wildlife Fund, that purchase debt. Its role would be to arbitrate the rate of exchange for the debt and the land being acquired. A major obstacle to debt-for-nature swaps in the past has been the inability to validate the price of the forest being purchased. Without a market for these government lands, it is difficult for either party to be confident with its side of the swap.

Over time, the United Nations could establish a data bank on swaps to help facilitate first-time trades. This also could be used as a clearinghouse for information on successful reforestation and reclamation programs. With the United Nations as the "agent" in these finan-



cial dealings, the data would be available for future swaps.

***Manage and Oversee Tax-Sharing  
Funds for Reclamation Projects (External  
Economic Processes -> Decision Mechanisms)***

As suggested earlier, an import tax on beef shipped to the United States could be imposed to fund reclamation projects. A portion of these funds would be held by the United Nations to reforest areas negatively affected by cattle ranching. It would, again, provide third-party objectivity to decisions about which countries and projects should receive reclamation funding, providing legitimacy that could not be achieved by either the U.S. government or a host government. Given the importance of this task in the reclamation of tropical forests, the United Nations' stature in the eyes of foreign governments and, most importantly, MNCs needs to be elevated. This coordination function also would place the United Nations in a data collection and allocation role, increasing input to the data bank on global environmental issues.

***Role of the Meat Industry Associations***

Although the National Cattlemen's Association (NCA), the Beef Industry Council, and the American Meat Institute have played a prominent role in professionalizing the cattle industry for many years, their potential involvement in solutions to tropical deforestation is significantly less important than that of the other organizations already discussed. Nevertheless, the role of these associations in coordinating industry information is potentially great. They could keep industry leaders informed about the development of incentive programs, changes in import and export legislation, and the implications of the deforestation issue. The purpose would be to keep members well informed about decisions regarding producing or importing beef from foreign countries. In addition, one or more of these organizations could serve as industry spokesperson when consumer awareness concerning the link between cattle and deforestation and other environmental issues increases. A study examin-

ing the effect of environmental awareness on consumers' buying decisions illustrates why meat organizations should contribute to the solution (Frankel 1992). The following three options pertain to the National Cattlemen's Association and external polity and economy, as illustrated in Figures 3 and 4.

***Expand the NCA Policy Role  
(External Sociopolitical Processes  
-> Dominant Sentiments and Behavior)***

This standing committee of the NCA could monitor legislative trends in the United States and key foreign countries relative to the deforestation issue. This information would then be assembled and distributed to the membership through newsletters.

The policy committee would provide a forum for the development of the industry's position. The NCA could develop position papers on topics that directly relate to deforestation; these policy statements could then be communicated to governmental officials. The proactive posture of the NCA would provide valuable public relations with concerned domestic consumers. Just as consumers increasingly are purchasing environmentally sound products and recycling, they also may embrace a product that does not contribute to a potential global disaster.

***Establish New Categorizations and  
Standards for Imported Products (External  
Economic Processes -> Decision Mechanisms)***

In conjunction with the branded product programs of the MNCs, the NCA should develop new standards for the amount of imported beef permitted in processed products. By taking a positive posture on this issue, the NCA could limit, or at least influence, the involvement of the federal government. Standards would also be developed and suggested for the fast food industry. Standards for beef products could help dampen some potential consumer criticism in the future. As consumer awareness of MNCs' involvement in deforestation increases, the reaction may directly affect the domestic beef industry.

**Issue Sanctions against Industry  
Violators (External Sociopolitical  
Structure → Power/Dependency Relations)**

As a last resort, the NCA could issue public sanctions against gross violations of the environmental standards they establish. While this step is highly unlikely, the trade association might highlight foreign competitors in tropical forests who have particularly bad environmental records. Through this type of moral persuasion, the NCA could influence members' actions without direct sanctions.

**THE POTENTIAL EFFECT AND  
SECONDARY EFFECTS OF THE  
POLITICAL ECONOMY FRAMEWORK**

Each of the actions identified in the proposed interactive set of alternatives based on the Global Political Economy Framework has a series of potential outcomes in the sociopolitical, economic, cultural, and environmental spheres. The constituents affected by these actions may be in the host country, the United States, other countries (interacting and non-interacting), MNC cattle ranchers, the United Nations, and the National Cattlemen's Association. Each group may view the proposed interactive solution from its own perspective and assess the effect of each element of this plan to resolve deforestation problems. An individual, ethnocentric perspective may or may not be consistent with that of any other group, but each group will make an assessment and evaluate the trade-offs inherent in each strategy suggested. A final verdict on the proposed solution would have to be reached by all involved parties within and outside the sociopolitical and economic macrosystem (Benson 1975), so an impact analysis would entail a detailed examination of each group interested in the solution and an assessment of each alternative. Although beyond the scope of this article, such an analysis would have to be undertaken before alternatives were implemented. The cost/benefit assessment would be essential in ascertaining the value received by constituents from each of the alternatives offered in this article.

Exhibit 2, an analysis from the perspective of a host government, illustrates the trade-offs in these interactive alternatives to deforestation in Central and South America. This impact analysis views each recommendation's effect on the economy, politics, society, individual consumer, and environment of the host country. Each of these elements could be affected differently. For example, the recommendation to Reduce Incentives to MNCs to cattle ranch in the host country would have a negative effect on the economy, the political party in power, the society, and the standard of living of individual consumers, but a positive effect on the aggregate environment of the country. An assessment of the same recommended strategy might yield significantly different results for one of the other constituents it would affect.

Many of the forecast results of the proposed strategies, such as the modification of incentives to companies, tax sharing, and a quota on the percentage of imported beef by product category, are explicit and could be measured. Other elements of the proposed solution could be determined to have a negative or positive effect, but measuring this magnitude of the influence would be difficult. Yet other actions, such as required land use proposals, required disclosures to consumers that they are buying imported beef products, or standards for domestic beef products in the domestic market, are indeterminate as to their effect.

A cost/benefit analysis is helpful in ascertaining the isolated effect of one aspect of an alternative on one constituent. The total effect of the solution on the global sociopolitical and economic system is a more complex issue. As with the input/output analysis of an economy, the complexity of the analysis decreases its usefulness. The frame of reference and the evaluator's perspective (individual consumer, social group, macroeconomy, or global economy) influence the outcome of a trade-off assessment. This corresponds to the political economy paradigm suggested earlier in this article.

**SUMMARY AND CONCLUSIONS**

In the growing movement toward a global village, the corporate citizenship of MNCs

**EXHIBIT 2**  
**COMPARISON OF THE EFFECTS OF PROPOSED STRATEGIES**  
**An Impact Analysis from the Perspective of the Host Government**

<b>Recommended Strategy</b>	<b>Effect of Proposed Strategy</b>				
	<b>Economic</b>	<b>Political</b>	<b>Societal</b>	<b>Con- sumer</b>	<b>Environ- mental</b>
<b>Host Government</b>					
Reduce Incentives to Industry	N <sup>1</sup>	N	N	N	P <sup>2</sup>
Require Land Use Proposals	N	P	P	? <sup>3</sup>	P
Require Reclamation Proposals	N	P	N	P	P
Coordinate with the Importing Country	N	N	P	P	P
Establish Tax Sharing on Imported Products	P	N	P	P	P
<b>U.S. Government</b>					
Require Disclosures to Domestic Customers	N	P	P	P / N	?
Influence World Bank Funding of Tropical Forest Projects	N	N	P	P	P
Set Imported Beef Content Quotas in Select Products	N	?	P	P	P
Support Debt-for-Nature Swaps	N	P / N	P	P	P
Financially Support an International Committee	N	P	P	P	P
<b>Multinational Corporations</b>					
Be a Better Corporate Citizen	N	P	P	P	P
Allocate Part of Beef Production for Indigenous Consumption	N	P	P	P	P
Develop a Branding Program for Beef Products	N	P	P	P	P
<b>United Nations</b>					
Establish an Annual Global Forest Convention	N	P	P	P	P
Manage Debt-for-Nature Swaps	P	P	P	P	P
Manage Tax-Sharing Funds for Reclamation Projects	P	P	P	P	P
<b>National Cattlemen's Association (U.S.)</b>					
Expand the NCA Policy Role	?	?	?	P	?
Set New Categories and Standards for Imported Beef	N	?	P	P	P
Issue Sanctions against Industry Violators	?	P	P	P	?

<sup>1</sup> N = Primarily negative effect on sector.

<sup>2</sup> P = Primarily positive effect on sector.

<sup>3</sup> ? = Undetermined and/or no primary effect on sector.

needs to be viewed from both the short-term and the long-term (global) perspectives. Conducting business in an environmentally harmful manner in one country can dramatically affect future success in other countries. The sharing of information concerning environmental problems among countries should become common, and MNCs with problematic environmental performance in one country would then have difficulty with projects in other countries.

Deforestation of tropical forests worldwide has become a focal point of governments in developing economies and of environmentalists. While the economic justifications for deforestation, such as debt reduction, creation of additional living space for growing populations, and increased food production, are valid in the short run, the cumulative consequences could create ecological calamity. The economic needs of these developing countries are great,

but the degradation of the environment has to be taken into consideration when making development decisions. The negative effects on the aesthetic, environmental, and commercial aspects of rain forests due to the razing and burning of millions of acres to make room for large-scale cattle ranching are beyond human calculation (Rifkin 1992). The economic needs of countries and their inhabitants must be balanced with the global environmental consequences of development in the tropical forests.

Since everyone is ultimately negatively affected by the decline of tropical forests, and since the protection and remediation of tropical forests requires the contribution of many parties, the search for solutions should be a worldwide effort. Needed is an integrated set of programs initiated by the tropical forest countries themselves, matched with coordinated and complementary programs by the community of nations. A concerted effort by the world community on a scale rarely envisioned by those attempting to resolve the deforestation dilemma must be implemented (Meyers 1992).

The Political Economy Framework can be used to assess the interrelationships among the conflicting economic and environmental issues. Consequently, the needs of all parties interested in the deforestation issue may be depicted in the model. Without a coordinated global effort, the host countries alone cannot stem the continuing eradication of their tropical forests. The short-term economic incentive to cut and clear tropical forests is too compelling a force for these countries and their populations to resist. Nonetheless, the ecological necessity to cease cutting and clearing these forests is too globally compelling to allow it to continue. Therein lies the acute conflict to which this article has sought a realistic and effective solution.

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