

**RAIN FOREST DESTRUCTION IN NICARAGUA: THE NEED
TO EMPOWER THE COUNTRY'S PEOPLE**

By

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The rain forests of Nicaragua are disappearing at an alarming rate. Accepting the most optimistic estimates, they may be gone by the year 2050 (WRM, 10/99, 1; Langelle, 10/99, 3; Mueller, 9/99, 1). This thesis attempts to identify the causes of deforestation in addition to possible solutions. The roles of local communities, government policy, and the international community are examined. Above all, the work demonstrates a close correlation between the loss of rain forest and the loss of local and national power over resources. While not sufficient in itself, any solution to the problem of deforestation must involve empowerment of local communities within Nicaragua.

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TABLE OF CONTENTS

Chapter	Page
PREFACE.....	vi
I. INTRODUCTION.....	1
II. THE VALUE OF NICARAGUA'S RAIN FORESTS.....	5
III. THE IMMEDIATE CAUSES OF DEFORESTATION.....	9
Resource Extraction By Large Companies.....	9
Colonization and the Forces Behind It.....	14
IV. THE IMMEDIATE HOPE FOR CONSERVATION.....	25
Indigenous Lifestyles and Emerging Movements.....	25
Mestizo Community Efforts.....	29
The Role of International Nongovernmental Organizations.....	30
V. THE IMPACT OF POLICIES OF NICARAGUAN GOVERNMENTS	32
VI. THE INFLUENCE OF THE INTERNATIONAL COMMUNITY.....	37
Military Involvement of the United States.....	37
International Lending, Trade, and "Aid".....	39
VII. EMPOWERMENT OF THE NICARAGUAN PEOPLE: A MULTIFACETED SOLUTION.....	45
ANNOTATED BIBLIOGRAPHY.....	50

PREFACE

The destruction of tropical rain forests has become an issue of much concern and discussion in recent decades. Global attention has been directed at the alarming rate of disappearance of these forests, and a number of environmentalists, scientists, economists, and politicians have identified different causes of destruction. Some people have pointed to lack of development and education coupled with population growth in third world countries (Hodder, 1968; Terborgh, 1993). Others have highlighted the unwise conversion of rain forests either to pasture for cattle or to agricultural production of export crops such as coffee and bananas (Parsons, 1993; Lohmann, 1993; Colchester 1993). Recently, attention has been drawn to the extraction of precious hardwoods and mining of ores within forests by national and foreign resource companies (Shriver, 3/99; Mueller, 9/99; Karliner, 9/99; Alexandre von Humboldt Center, 10/99). Some individuals have blamed locals for the destruction they cause, others have blamed governments for the policies they impose, and an isolated few have pointed to foreign influence in trade or debt as the major factor of deforestation.

While some of the supposed causes of rain forest disappearance collapse upon serious evaluation, all contain some element of truth. Many of the issues raised are serious factors of deforestation. The problem is that few people have gone beyond examining single dimensions of rain forest destruction. This type of analysis distorts the relative importance of certain factors, and the necessary connections between different issues are often ignored.

In my first approach to the issue of deforestation in Nicaragua, I was guilty of such an approach. I was drawn to Nicaragua because of the political upheaval it has experienced over the past thirty years in which a strict dictator, a socialist party, and a mixed government headed by conservatives have led the country in turn. My goal was to show how different political atmospheres had contributed to rates of deforestation. While

show how different political atmospheres had contributed to rates of deforestation. While I found that governments had valued the forests differently and taken unique approaches to land use, the actual fate of the forests was not directly linked to such differences. My approach was exaggerating the influence of government and underestimating other important and related issues.

As I discarded my chosen lens, the issue of deforestation in Nicaragua became much more complicated. While this has made the search for a solution more difficult in some respects, it has in a sense made the conclusion more hopeful. My initial stance implied that if the government were not structured in a particular way, deforestation could not be halted. The following pages will show, on the contrary, that the government is only one of many players influencing the fate of Nicaraguan forests. While I do believe that the following text relays a concrete message regarding what must be done to conserve rain forests, I have attempted to approach this conclusion through a holistic examination of the Nicaraguan situation.

CHAPTER I

INTRODUCTION

Imagine for a moment that you are surrounded by lush vegetation. The air you move through is warm and moist, almost tangible, and filled with the constant sounds of insects and birds. You are a member of the Mayangna indigenous group in the rain forest of northeastern Nicaragua. Your people have resided in the forest for centuries, and you have inherited a deep knowledge of your surroundings. Each plant is known to you based on its healing properties or utility as a building material or food source, whether it produces some edible root, nut, or fruit or draws certain animals to it. Currently, you are searching for a new plot of land which your family will clear to sow some basic crops. It is time that the older plots were allowed to return to the forest as they no longer yield as much food. The task of finding and clearing new plots has always been laborious, but in recent years it has become much more complicated.

Throughout the last three or four generations, your community has witnessed waves of new people moving into the rain forest. Companies construct roads to either cut and haul away trees or begin large mining operations for gold and other ores. This paves the way for less extreme but more permanent invaders. Colonizers move from their farmland in the west to settle in the rain forest. They began in earnest at about the time when your parents were your age. The flow has not been constant, it slowed for a number of years when men with guns invaded the forests to wage a war of which you understood little. Recently, however, people seem to be arriving faster than ever. Perhaps it would not be so bad if they understood how to live with the land, but too often they do not. You have seen them clear plots which they use until the soil is stripped of any nutrients and yields almost nothing. Frequently, they then give this land to individuals with cattle which finish off the destruction, making it impossible for the land to return to its former vegetation. The original colonizers either move on to repeat the process on new plots, or

move to one of the many small cities which are springing up at the edge of the shrinking forest.

While your community initially tried to ignore these changes, it is becoming ever more difficult. The region of forest which your people have used for as long as anyone can remember is disappearing. Some Mayangna have even taken jobs with arriving companies and moved into emerging cities. You feel that the very existence of your culture is threatened as the forest disappears. As you look for a new place in which to sow crops, you wonder how long it will be before the outsiders reach the border of your village.

In all of Central America, Nicaragua is the country with the largest remaining tracts of rain forest. It has fared better than nearby El Salvador, for example, which retains as little as three percent of its original forest cover (Mueller, 9/99, 1). Unfortunately, Nicaragua's distinction in this respect is disappearing rapidly. Between 1950 and 1990, the country lost half of its forests. Today, although specific estimates vary, the rate of deforestation is disheartening. The Centro Humboldt in Nicaragua estimates that at the current rate of 150,000 hectares per year (one hectare is 100 meters by 100 meters, about equal to 2.4 acres) forests will be gone by the year 2025 (WRM, 10/99, 1). Some observers cite a slower deforestation rate of 100,000 hectares per year (Langelle, 10/99, 3), but others are more pessimistic and believe the rain forest may disappear in ten to twenty years (Mueller, 9/99, 1). Such figures may not account for reforestation and vary based on what is technically labeled rain forest. However, even accepting the most optimistic estimates, the rain forest will be nearly gone before the middle of this century if current trends continue.

There are many different levels to the problem of deforestation in Nicaragua. The immediate causes are the extraction of resources by export companies and the colonization of the rain forest by poor farmers from other regions of the country.

However, to label these as the primary reasons for forest disappearance is too simplistic. Rain forest colonization is occurring because Nicaragua's more fertile land continues to become concentrated in the hands of a wealthy few who produce export crops, and those who historically used it are forced to move either to cities or the forest. The governments of Nicaragua have alternately encouraged and fought this concentration of land, thereby indirectly affecting the fate of the forests. They have also both discouraged and aided resource extraction by creating and protecting reserves, and then granting special concessions to foreign companies within the forest. Government clearly has an important role in the issue of deforestation (detailed discussion in chapter V).

Even less direct, but no less important, has been the influence which international agencies like the World Bank and countries such as the United States have had in directing the history and policies of Nicaragua. International lending institutions have encouraged development based on increased export revenues with little thought to its effects on the people and even less to the rain forests. The United States has similarly involved itself directly in the determination of the country's government and economy. The increased incorporation of countries such as Nicaragua into the system of world trade will only increase such outside influence. Its effects are integral to the issue of deforestation, especially as they constitute an area in which people outside the country might make the greatest difference (detailed discussion in chapter VI).

While colonization and resource extraction have had the most direct negative impact on the rain forest, direct positive action has come primarily from local community organizations. Indigenous peoples as well as mestizo immigrants to the forest have recently joined together to protest the mining of resources by foreign companies. A few communities, sometimes with the help of international organizations, have also begun experiments in sustainable living. They educate themselves as to how to make the least impact on their surroundings without sacrificing quality of life (detailed discussion in chapter IV).

To conserve Nicaragua's rain forests, such community organization should be encouraged while colonization and resource extraction must at least diminish and change. While these are separate issues, they each involve one essential element: the empowerment of people within Nicaragua. At a local level, the government and international groups must grant communities both the education and support they need to find ways of living in harmony with the forest. The voice and rights of the indigenous peoples should be protected so that they will have the power to continue fighting for themselves and the forest. Elsewhere in Nicaragua, means must be found to establish greater security of land ownership for small farmers so that they will not be forced to migrate to the forest. The sale of forest resources to foreign companies should also be reevaluated as it benefits distant élites more than local communities and the country as a whole. In each of these issues, local people, government, international agencies, and foreign countries have been involved and should bear some responsibility for the solution. The conservation of the rain forest will be both complicated and difficult, but we can accomplish it if one essential connection is valued. The fate of Nicaragua's rain forest is tied to the fate of its people; if they are allowed greater power, then the forests can be saved.

CHAPTER II

THE VALUE OF NICARAGUA'S RAIN FORESTS

The rain forests of Nicaragua are specifically designated the "tropical moist forest life zone." Rainfall averages twenty-five hundred millimeters per year, with a dry season between January and April (Godoy, 1995, 236). While they do not receive as much rainfall as true rain forests found in places such as the Amazon, they greatly resemble these areas in almost every way. Therefore, although a strict ecologist or geologist might contest their being termed simply "rain forests," the popular terminology will be used throughout this paper for the sake of convenience.

No matter how we label it, the Nicaraguan rain forest is important in both a local and global sense. While its local value may be more immediate, it is important globally as a component of the world's tropical forest ecosystems. Although it makes up a small percentage of the earth's rain forests, its conservation is necessary to the joint struggle of tropical countries worldwide to protect their forests.

Rain forests are integral to the well-being of the planet. They contribute to climate stability, contain vast ecological gene banks due to high biodiversity, and possess an intrinsic value recognized by many around the world. Rain forests contribute to climate stability in part because they store large amounts of carbon. When the forests are cleared and replaced with agriculture or pasture land, not only is carbon released immediately during the felling and burning of trees, but the new ecosystem is unable to store as much carbon. This means that gases such as carbon dioxide (CO₂) and methane (CH₄) are released into the atmosphere (McElroy, 1984, 39, 55). Both are prominent greenhouse gases; their accumulation in the atmosphere is accepted by most scientists as a cause of global warming. While the combustion of fossil fuels in automobiles and other industrial activities contribute more, destruction of rain forests does lead to the

greenhouse effect. If global warming persists, it will have dramatic effects on climate everywhere. For example, thermal expansion of ocean water and melting of alpine glaciers would lead to an increase in sea levels which would swamp island and maritime communities (Titus, 1989, 176).

Many researchers now agree that rain forests determine climate in another manner as well. Transpiration of water off of plant surfaces may actually create up to half of the rain which occurs in the forests themselves (Place, 1993, xvi). It is difficult to determine if a disruption in this hydrologic cycle might lead to farther reaching climatic change.

Rain forests are also essential in terms of biodiversity. Although they cover only six percent of the earth's surface, they contain at least 50 percent of the world's known plant and animal species (Brown, Pearce, 1994, 3). As many of the species within the rain forests have yet to be identified, the ecosystem's comparative biodiversity is potentially greater. Central America is particularly unique because it acts as a bridge between North and South America where many different species converge (Karlner, 1993, 71).

The term "ecological gene banks" is used to label a portion of the potential economic value of this biodiversity. The possibility of using plants and animals of the rain forest for their medicinal properties is well publicized. In 1984, Myers estimated that as many as one in four pharmaceutical products originated, at least in part, in tropical forests. The commercial value of such products exceeded \$20 billion per year (Myers, 1984, 210). As greater understanding of rain forest species and indigenous healing practices increases, medicinal research in the forest will likely yield further results.

Plants of the forest possess even greater genetic value for the food which we eat. With the streamlining of agriculture, genetic diversity within crops has continually decreased. Myers explains,

All modern crops, being the refined products of selective breeding, constantly require new genetic material in order to maintain and even expand their

productivity, to enhance their nutritive content, to improve their taste (or to restore it) and to resist emergent types of diseases and pests, as well as environmental stresses such as cold and drought (Myers, 1984, 189).

Rain forests, with their great biodiversity, possess numerous species which are genetically related to the foods which we consume. The forests can be seen as wild gene reserves from which we may harvest fresh genetic material. Undoubtedly, there are also entirely new foods waiting to be refined from the forest. For example, Myers estimates that as many as 2500 species of edible fruit may exist in the rain forest, while only fifteen are consumed on a large scale today (Myers, 1984, 193).

Other rain forest products which possess a commercial value include latexes such as rubber and lianas which can be refined as screens or furniture. In addition, species which we know little about have a value for more general scientific study. Research on individual plants and animals as well as their interactions could teach us much about the way our world functions. All of these values are likely to increase with time as new technology is developed and we discover new ways to take advantage of such forest resources.

While the simple inherent value of rain forests may be a matter of opinion, there are a large number of people around the world who do care about their conservation. It increases the comfort of many simply to know that rain forests are still in existence, that there is some area of the planet relatively untouched by western development. Although it is difficult to place a value on the psychological impact of knowing that rain forests exist, it is worth at least mentioning that a large number of individuals far from the forests would suffer through their destruction, even if it did not effect their livelihoods.

The global effects of deforestation may be disturbing, but the local effects are arguably more drastic. Within Nicaragua, the Mayangna (or Sumu) and Miskito are indigenous groups who have lived within the rain forest and on its boundaries for many centuries. They traditionally lived in a sustainable manner, relying on the forest to provide both food and shelter. As the rain forest is destroyed, these people and their

cultures face extinction as well. This is horrible in itself, but it also means that their particular knowledge and view of the world may be forever lost to the rest of humanity.

The promotion of or failure to prevent rain forest destruction is also costly in a purely economic sense for Nicaraguans. If the approach to resource extraction changed, it would be possible to moderately harvest medicinal plants, food, timber, and other products from the forest indefinitely. As discussed above, there are a plethora of such items and their number and value would be likely to increase with time as knowledge of the Nicaraguan rain forest increased. Instead of such sustainable use, a very small number of individuals make great profits now through extracting large amounts of wood or ores with no attempts to conserve the rain forest for the future.

Finally, intact forests fulfill the important role of soil stabilization. Without vegetation in place, soils are very vulnerable to erosion as a result of the area's torrential rains. The severe effects which erosion can have were sadly demonstrated in the Fall of 1998 when Hurricane Mitch struck Central America. In Nicaragua, a number of landslides and floods occurred. One of these was a lahar which originated when the crater lake of Las Casitas volcano collapsed. The mudslide swept over at least two villages, killing more than 2500 citizens of the area (Langelle, 1999, 4). Recent settlers had deforested the slopes of the volcano, leaving no barrier between the village and the crater above and nothing to stabilize the soil. Most reports on the event agree that this contributed to the severity of the disaster, although one observer has argued that the quantity of rain and the instability of the crater itself made the lahar inevitable (Fletcher, 5/99, 1). Another flood destroyed over 600 homes and damaged an additional 1300 in the village of Wiwili. In this case, it was evident that deforestation in the upper Rio Coco watershed greatly exacerbated the river's destructive rise (WRM, 1/99, 1). The costs of recovery shared by both affected communities and the government were huge. Extreme events such as hurricanes are inevitable in Nicaragua, but their effects could be mitigated if forests were left intact, thereby stabilizing soils.

CHAPTER III

THE IMMEDIATE CAUSES OF DEFORESTATION

In examining the issue of rain forest destruction in Nicaragua, it makes sense to first identify its direct causes. The country's rain forests were essentially intact up until the twentieth century. At this point, two phenomena began to threaten their existence. First of all, a number of companies, most of them foreign, became interested in harvesting resources from the forest for refinement and sale abroad. Secondly, small farmers began colonizing land at the borders of the rain forest as competition for land in the country's traditional agricultural zone increased. These two phenomena will be discussed in depth before a specific analysis of how government and the international community have contributed to them.

Resource Extraction By Large Companies

The resource which initially attracted most companies to Nicaragua's rain forest was, of course, lumber. The country is home to over seventeen species of precious hardwoods such as mahogany, pochote, and royal cedar in addition to hundreds of other types of trees (Alexander von Humboldt Centre et al., 10/99, 2). It was at the beginning of the twentieth century that companies, initially from the United States, began to harvest this resource seriously.

In the early and mid-1900s, approximately 240,000 hectares of forest on the Northern Atlantic coast were cleared by US firms. Much of this was pine forest rather than rain forest, but the logging activity established a trend which continues in the forests today. Utting explains,

Lumber companies would move in, clear large areas and then move out. Such was the case, for example, of the Nicaraguan Long Leaf Pine Lumber Company which began operations in 1945 and soon became the largest lumber company in

the country. By the 1960s it had already depleted much of Northern Zelaya's pine resources and it ceased operating in 1963 (Utting, 1993, 54).

Such companies would stay only long enough to make a profit from Nicaragua's trees.

Up until 1979, these US firms were granted local fiefdoms in the forest (Weinberg, 7/98, 1). When the socialist Sandinista party came to power, such companies withdrew from the country (Nietschmann, 1995, 25). Since the end of the Sandinista reign in 1990, however, transnational logging companies have again invaded the forests. They are more diverse in the sense that rather than initiating solely in the United States, subsidiaries of corporations from Asia, Australia, Canada, and other countries currently operate in Nicaragua.

A large controversy recently developed over the largest logging concession ever granted to a foreign company within the rain forest. In March of 1996, the former president of Nicaragua, Violeta Chamorro, granted a concession of 62,000 hectares to Sol del Caribe (SOLCARSA), a subsidiary of the South Korean company Kum Kyung. This concession was granted in the north-eastern region of the rain forest which the Mayangna people claim as traditional lands. As the company began logging, representatives of the indigenous community protested, claiming that the government had not consulted their region as stipulated in the constitution. After a long legal battle in which the Mayangna were aided by the Indian Law Resource Center (ILRC) based in Washington, DC, the concession was canceled in February of 1998. This did not occur, however, until after much logging had already taken place. In addition, SOLCARSA was able to continue buying logs from locals in the area which encouraged them to harvest trees (Weinberg, 7/98,1-3).

The government has officially recognized that there is a problem with excess logging in the forests. The current president of Nicaragua, Arnoldo Alemán, instituted a ban on the export of precious hardwoods in 1997 which he extended to a ban on their cutting in 1998. Unfortunately, this ban occurred in conjunction with a drop in funding

for environmental enforcement. As predicted by most environmentalists, the ban had little effect and illegal logging only increased. In addition, the government could still make individual concessions to specific companies operating within the rain forest (Mueller, 9/99, 1). In response to the moratorium's failure, the president canceled the ban in August of 1999, instituting a 7.5 percent tax on the export of hardwoods in its place. Environmental and indigenous groups have criticized this move as illegal logging is likely to continue to avoid the tax, and many fear that, where it is paid, land owners rather than companies will suffer the drop in earnings (Shriver, 8/99, 1).

Currently, there are approximately ninety-six logging companies operating in Nicaragua, many of them within the rain forest (Shriver, 8/99, 1). Lohmann makes a valid commentary regarding the nature of such operations:

Throughout the history of deforestation, the "population" with the greatest negative impact on forests, both direct and indirect, have tended to be distant élites, not people who are accustomed to living in or close to particular forests. The bulk of the trees removed from tropical forests go for urban or foreign use (Lohmann, 1993, 25).

It is true that members of the mestizo and indigenous communities settled within the rain forest have participated in logging operations. In fact, as far back as 1925, the Bragman's Bluff Lumber Company was the largest employer in Nicaragua with approximately three thousand workers (Utting, 1993, 54). In the long term, such employment has had the effect of drawing peoples who traditionally led a subsistence lifestyle into the market economy. Laborers earn very minimal wages. Individuals working for SOLCARSA up until 1998, for example, earned approximately \$2.50 per day (Weinberg, 7/98, 2). This money is spent quickly in the cities which appear around logging operations, and families are unable to support themselves solely on such wages. Traditional indigenous culture has eroded as a result of the employment, and local communities suffer results of deforestation such as soil destabilization long after companies leave the area. On the

contrary, the lumber harvested has a high market value in foreign countries, and transnational logging companies are able to reap huge profits from its sale.

While it has attracted many, lumber is not the only resource to have drawn extraction companies to the rain forest. In addition to logging, there is a long history of mining within the Nicaraguan forest. British companies began explorations for gold at the end of the nineteenth century. These were later followed by US and Canadian firms. At first, companies used mercury to extract gold from ores. Now they rely on a cyanide process. These and other chemicals contaminate rain forest watersheds. Firms also cut down trees to build structures in and around the mines. As in the case of logging, such operations have typically used mestizo and native people as a source of cheap labor (Rice, 5-6/99, 62).

The recent case of Recursos Nicaragüenses y Australianos SA (RENAUSTRA) illustrates how many transnational companies operate inside the rain forest. Within Nicaragua, and in fact all of Central America, the Bosawas Biosphere Reserve is the largest tract of rain forest under protected status. The company RENAUSTRA, which is financed by Mars Geosciences and Boss Resource Corp. based in Australia, obtained a concession from the government in 1996 for gold mining exploration in the buffer region of Bosawas. Not only is this area a near pristine rain forest in itself, but it also contains rivers such as the Bocay which run directly into the heart of the reserve. Exploratory drilling actually began in the summer of 1998. If the mining operation goes forward, then the region's watersheds will face contamination by cyanide and heavy metals. Deforestation and excavation at the drilling sites is also inevitable. The Centro Humboldt, a conservation group within Nicaragua, reported that RENAUSTRA launched a misleading propaganda campaign and began bribing officials within nearby communities to safeguard its efforts. It has also violated its permit by changing the location of its drilling sites (Alexander von Humboldt Centre, 10/99, 1-3). As in the case of SOLCARSA, Mayangna individuals have joined with conservation groups to protest

the mining operation. Members of RENAUSTRA have clearly demonstrated a lack of respect for both nearby communities and the Nicaraguan government. If gold mining goes forward, it will benefit the company almost exclusively, while local communities will be left to suffer the results.

As of this year, another resource may draw additional mining companies to the country. The Oil and Gas Journal ran an article in February, 2000 praising "a new attractive hydrocarbon law" which will make oil drilling feasible on both the western and eastern coasts of Nicaragua. The western region in question includes primarily border regions of rain forest as well as some forest itself. While the government of Nicaragua has toyed with the idea of developing oil reserves in the past, this is the first time that such plans have become concrete. The first bidding round for exploration by transnational companies takes place this spring (Darce, 2/00, 72). The Nicaraguan government hopes that such drilling will provide the country with a cheaper fuel source, but transnationals will undoubtedly sell the oil at the highest price possible on the world market. Development of oil, like development of the gold mining and lumber industries in the past, is likely to be of most benefit individuals distant from the site while destroying forest and harming local communities.

In addition to direct deforestation, resource extraction harms the forests because either the government or companies themselves build roads to facilitate transport of goods. Trees are cut during construction, and, more importantly, the roads provide access to the forest for farmers migrating from other regions of the country. Initial destruction wrought by resource extraction literally paves the way for settlers to enter the forest. The issue of forest colonization is discussed in depth in the following section.

Having examined specific examples of resource extraction, it is interesting to note that, according to the Central Bank, in 1997, direct forestry and mining activities together made up only about one percent of Nicaragua's gross domestic product (US Embassy Managua, 3/98, 2). If there were a separate GDP for the rain forest regions, this

percentage would of course be much higher. Mining and forestry are concentrated within the forest, while almost all other economic activities are conducted outside of it. In addition, the figures were reported during President Alemán's ban on the cutting of hardwoods. Illegal sales of lumber to companies might not be included. In any event, the comparatively slight, national, economic benefit of resource extraction by transnationals is another reason for such activities to cease. If companies ceased building roads to bring people to the forest, the need for local economic activity would decrease. Those communities which are already there could rely more on a sustainable, mixed use of the rain forest for their livelihoods.

Colonization and the Forces Behind It

Aside from direct resource extraction, often by foreign companies, the primary pressure on Nicaragua's forests has been colonization by poor farmers from other regions of the country. Individuals and families who lose access to land in traditional agricultural zones, move to the forests because it is the only space available for farming. Plots are found either at the edge of the forest or along roads within it created for resource extraction. Typically, families purchase rain forest cheaply, and may even be encouraged to move by the government. While this invasion perhaps lacks the shock value of massive company operations, it is in a sense more severe as those who move to the forest often establish themselves permanently.

While the sheer number of people moving to the forest creates a problem, the impact is heightened because colonizers have no experience working with the type of soil and climate they encounter there. Indigenous groups, such as the Mayangna, historically relied on shifting cultivation in the rain forest. They would clear and burn a plot of land, harvest crops from it for two to three years, and then clear a new plot, allowing secondary

growth to occur and the soil nutrients to replenish themselves over fifteen to twenty years (Parsons, 1993, 40). This fallow period was particularly important due to the fragility of rain forest soils. Converse to what one might assume, such soils are relatively low in nutrients, and when vegetation is removed, those that they contain are quickly leached out by the area's rainfall. When colonizers move to the forest however, they are anxious to produce as many subsistence and cash crops from the land as possible. They often overwork plots and then fail to allow them to lie fallow and recover. Productivity diminishes, and families will simply sell the land and move on. After a few such frustrated attempts, people may give up and move to one of the cities which have grown up within the forest. They continue to put pressure on surrounding areas, relying on them as a source of fuelwood. In addition, those in the city often become wage earners, usually finding jobs with the companies involved in resource extraction discussed above. Even if they do not have a job directly through a company, they may harvest lumber or other resources, often illegally, for sale to such firms.

The property that is left behind usually does not remain idle. When farmers give up on plots and sell them, small cattle ranchers are frequently the buyers. The land is conveniently cleared for them, and weakened soils can still support grass for their livestock. Unfortunately, cattle make the damage to the ecosystem more permanent. Their hooves compact the soil to the point that sometimes it even ceases to serve as pasture land. When it is deserted, this makes recovery of rain forest vegetation almost impossible.

In addition to these direct impacts on the forest, colonization has created conflicts between arriving mestizo farmers and the indigenous Miskito and Mayangna groups in Nicaragua. Between the 1950s and 1970s there was a huge influx of migrants to rain forest regions and disputes over land rights were rampant (Utting, 1993, 55). Often Mayangna communities would relocate to more interior regions of the forest, thereby placing greater pressure on previously inaccessible areas and, ironically, sometimes

drawing colonizers after them. While some conflict still exists, this problem has diminished slightly. Mestizo immigrants and indigenous communities have been forced to accept one another's presence. In some instances, they have even joined together to protest the work of transnational companies when their mutual land or health has been threatened (Karlner, 9/99, 1; Alexander von Humboldt Centre, 10/99, 1).

To confront the issue of colonization, it is necessary to understand why it has arisen. Upon a first analysis, many have labeled overpopulation as the cause of migration to the rain forest. Terborgh claims that with rising population in Latin America, "millions of penniless and illiterate peasants failed to find jobs in the cities or land in the comfortable highlands that had for so long been the bastion of the region's landed gentry. Faced with no other alternatives, they flooded into wilderness that no one had previously wanted and began to hack out pitiful little plots (Terborough, 1993, 34)." There is certainly an element of truth to this position. Nicaragua has a population growth rate of 2.84 percent, which makes the doubling time about 24.5 years (CIA, 1999, 3). As Kahn states, "If the minimum level of per capita consumption is held constant, increases in population will increase the minimum level of aggregate consumption and therefore lead to more deforestation (Kahn, 1994, 60)." Population growth in Nicaragua has certainly exacerbated the pressure on the forest.

However, this growth in itself does not fully explain the colonization phenomenon. Lohmann, in fact, describes the commonly identified link between overpopulation and forest disappearance as a myth, stating, "The halving of Central America's forest area between 1950 and 1990. . . is due not to a 'population explosion' but to the concentration of land in the hands of a limited number of rich ranchers and landowners raising bananas, cotton, coffee, and cattle (Lohmann, 1993, 23)." A thorough examination of Nicaragua's history confirms this conclusion. Population increase would not lead to migration to the extent that it does if land were distributed more equitably.

The most rapid periods of forest colonization have coincided with increases in the concentration of land. This trend and the reasons for it must be explained.

The patterns of land ownership in Nicaragua were set in the period of European colonization. Upon arrival in the new world, Europeans concentrated land in the hands of few owners in order to reduce competition for labor. Communal systems of land ownership were done away with, and indigenous people were legally forced to work on the plantations of European settlers (Plant, 1993, 44-45). The "latifundia" system remained in place until Nicaragua's independence. At this point, the law ceased to simply require that native peoples work for those of European descent, but the basic structure of land ownership remained in place. The latifundia system metamorphosed into a system of "haciendas" in which large landowners found peasants to work for low wages and, sometimes, the permission to plant subsistence crops on their property. There were, of course, some small farmers who owned property, but the percentage of land which small farmers control has decreased significantly through most of the last century.

By the mid 1970s, throughout Central America as a whole, four percent of the population owned seventy-three percent of the land while only seven percent was in the hands of the poorest seventy-seven percent of the region's people (Karliner, 1993, 73). In Nicaragua, one percent of the population controlled a full half of the nation's land (Rice, 5-6/89, 64). A study of land distribution was conducted in the region of Segovias, in the Northern interior of the country. At the turn of the century, the average family had seventy-three hectares. By 1980, this had dropped to thirteen hectares. At this time, half of the land was shared by eight thousand low income families, while the other half was owned by just three hundred families (Utting, 1993, 84). One result of this has been a high incidence of landlessness. Throughout Latin America as a whole, approximately seventy-one percent of all agricultural households possess no property (Plant, 1993, 41). This makes the rain forest attractive in spite of harsh conditions, as it at least offers poor

farmers the chance to own land, thereby increasing their sense of security and status within the community.

The accumulation of property by the wealthy few has been promoted by Nicaragua's focus on export agriculture. Traditional export products such as bananas and coffee can be most efficiently raised and harvested on large segments of land. Those involved in agriculture of a large scale have money to invest in pesticides and labor. Banks have also granted them greater access to credit due to traditionally high returns on such products. As the market for such Nicaraguan crops has grown, it has encouraged wealthy landowners to increase their holdings by either purchasing plots from those who will sell cheaply, or, in some instances, simply forcing them off of their land.

The history of export production dates back to colonization since Europeans often grew and refined crops to send back to their native countries. However, like the concentration of land, such production has greatly increased over the past century. Since the end of the 1800s, bananas, coffee, cotton, sugar, and cattle have been the primary cash crops, bringing in the bulk of the country's export revenues (Faber, 8/86, 2). Collins notes that "from the early 1950s to the mid 1970s, the agricultural land used to produce luxury crops expanded almost forty percent (Collins, 1986, 107; the term "luxury" crops refers to non-subsistence crops typically consumed only by the upper classes of Central America)." The focus on export crops was such that their production received ninety percent of all agricultural credit. Local food production, typically the realm of small farmers, was virtually dismissed by lenders to the extent that, in 1978, the country actually imported over 210,000 tons of basic grains which could be grown in Nicaragua (Collins, 1986, 107).

Utting draws a direct connection between the cotton boom of the 1950s and 1960s, the cattle boom of the 1960s and 1970s, and the increased colonization of the rain forest during those periods (Utting, 1993, 18). The history of cattle in Nicaragua is particularly illustrative.

As in Latin America in general, cattle ranching exploded in the 1960s in Nicaragua. Ranchers converted thousands of acres in the Atlantic region to pasture, sometimes seizing land with the help of the National Guard. Beef exports jumped from almost zero in 1958 to \$6.7 million in 1965 and \$26.6 million in 1970. Nicaragua became the number one Latin American beef supplier to the United States. (Rice, 5-6/89, 65)

Less than ten years ago, the number of cattle actually exceeded the number of people in Nicaragua (Parsons, 1993, 39). Even the government became heavily involved in cattle ranching. The Somoza family, which ruled the country from 1934 to 1979, came to own twenty percent of the country's land, which it devoted to the lucrative cattle business (Karliner, 1/86, 2).

Colonization of the rain forest by those who lost their land to cattle or export crops was not an exclusively spontaneous phenomenon. While farmers often moved to the forests on their own, the Somoza government also instituted a colonization project in response to increasing conflict over land in traditional agricultural zones. The Rigoberta Cabezas Project, instituted in 1972, aimed initially to relocate people in a fifty thousand hectare region of the North-eastern rain forest, although the government actually had four hundred thousand hectares in mind as the ultimate goal (Utting, 1993, 18, 39). This project was sponsored by the United States and international institutions in the hope of dissolving revolutionary tensions which were growing in Nicaragua and other Central American countries. Both the government and foreign groups viewed the colonization trend favorably as it would free up lands on the Pacific coast for export production.

As a result of such policies, by the end of the 1970s, migration to the forest was at its peak. The only means of slowing it was to shift the national view of agriculture, which implied a shift away from the interests of the powerful, wealthy landowners. This is exactly what happened in 1979, when a popular revolution brought the socialist Sandinista government to power. Gilbert explains,

The insurrection that toppled Anastasio Somoza Debayle . . . was more fundamentally rooted in the pattern of economic development of preceding

decades. Toward the end of the nineteenth century, a gradual process of economic change began that transformed Nicaragua's subsistence agriculture economy into an agro-export economy (Gilbert, 1986, 89-90).

In other words, the rain forest colonization project was not enough to diffuse the frustration which mounted in Nicaragua as prime agricultural land was taken from the poor and given to the rich. The revolution which many had feared, came to pass.

While Sandinista policies and their effects on the rain forest will be discussed in more detail in a later chapter, at this point it is necessary to explain the new approach which the Sandinistas took towards colonization, land distribution, and agriculture. First of all, the Rigoberta Cabezas Colonization Project was fully halted by 1983 (Karlner, 1993, 77). The government looked favorably upon environmental protection and had created the Nicaraguan Institute of Natural Resources and the Environment (IRENA) which encouraged the end of the project. The unequal distribution of land had also diminished by that time, thus removing the logic behind forced colonization.

More equitable land distribution was brought about through an ambitious policy of agrarian reform. The Sandinistas received much of their support from low-income farmers who had often seen their property shrink or disappear to the benefit of large, export plantations. The government was committed to land redistribution and hoped ultimately to redistribute sixty percent of arable land (Gilbert, 1986, 112). By 1984, more than forty-five thousand families had received land (Karlner, 1986, 4). By the end of the Sandinista rule, this total was brought to two hundred thousand families who had received over four million acres, less than what the government had hoped, but still a significant figure (Nitlapán Team, 12/94, 21). Most of the initial confiscations came from the large holdings of the Somoza family itself, but some large property owners, often foreign, also lost their property.

This process of land distribution was coupled with an orientation away from export agriculture. While production of cotton, coffee, bananas, beef, and other cash crops did not end entirely, from the beginning of their rule, the Sandinistas focused on

". . . a program to maximize production and equalize distribution of the basic food commodities on which lower class diets depend (Gilbert, 1986, 111)." Aside from benefiting people and the environment, there was an economic basis for such a policy. At the end of the Somoza reign, the country had been importing a number of its basic food crops. Collins, whose research is invaluable in this area, explains,

Calculations indicated that on only sixty percent of the amount of prime land being used to grow the cotton that earned the dollars to import beans from the US, it would be possible to raise the same quantity of beans- and they would be Nicaraguan beans grown on Nicaraguan soil (Collins, 1986, 111).

The Sandinistas implemented the National Food Program (Programa Alimentario Nacional, PAN) and encouraged farmers to raise beans and corn. Incentives towards this included a boost in the price paid to small farmers for those products as well as an increase in the availability of credit (Collins, 1986, 113; Cuenca, 1992, 48). Training programs were also initiated to teach farmers skills such as how to store corn without losing as much of the harvest to rodents or mildew. The success of such incentives was demonstrated as early as 1981 when bean production more than doubled, making the country self-sufficient for that crop despite increased consumption. At the same time, the Sandinistas attempted to dissuade people from raising and consuming beef, so that land could be used more efficiently for agriculture (Collins, 1986, 114-116).

Partially as a result of these policies, rain forest colonization slowed during the 1980s and the rate of deforestation decreased (Nietschmann, 1995, 1, 25; Utting, 1993, 10). Many scholars agree that agrarian reform initiatives are among the best solutions to rain forest colonization (Colchester, 1993, 15). The government did not achieve all that it hoped to in this area, however, and many of the gains which were made are in the process of being reversed.

The explanation for this failure can be found primarily in the war which was waged against Nicaragua's socialist government by the US supported "contra" troops as well as the economic embargo enforced against them. Throughout the period of their

rule, the Sandinistas were unable to trade with the United States, and had very little access to credit through international lending institutions. What money they did have was further restricted as funds were increasingly directed to defense against the "low-intensity" warfare of the contras. This reduced financial and technological support for recipients of redistributed land. In addition, the contras often directly targeted those involved in agrarian reform projects. Some of the land which had been redistributed was given to cooperatives. In the first six months of 1984 alone, the contras attacked and destroyed eleven such farms. Collins visited the cooperative of San Jeronimo after an attack, and describes the aftermath,

The contras' mortar fire had burned the coffee mill to the ground. A large storehouse was also reduced to charred rubble. It had contained machinery and one hundred pound sacks of fertilizer, the cooperatives offices and account books, the kitchen and dining hall used during the harvest, recently purchased building materials, school supplies for adult evening classes, and medicines and clothing left by Austrian volunteers who had helped with the harvest (Collins, 1986, 144-145).

Such attacks were successful in discouraging people from participating in government sponsored projects.

There were some elements of Nicaraguan agrarian reform in itself which have also contributed to the reversal of advances. Land was sometimes distributed in communal form. One individual was elected to direct the collective and often held the title for the entire acreage. A number of the communes have now been parceled out by individuals who desire separate properties, but the individual claims are not recognized legally. In some instances, the Sandinistas simply failed to issue new titles at all, which has made it possible for former owners to stake claim to the land. Finally, there were a few cases where failure to survey land in advance meant that areas of forest were mistakenly distributed through reform (Utting, 1993, 43). While the scale of this was much smaller than the Rigoberta Cabezas Project, the Sandinista government in a sense forced colonization of these regions.

In 1990, the National Union of Opposition (Unión Nacional Opositorio, UNO) party came to power, headed by Violetta Chamorro. Leadership then passed to Arnoldo Alemán of the Liberal Coalition in 1996. Both presidents have turned sharply away from the projects and policies of the Sandinistas, and, encouraged by foreign lenders and trade partners, once again encourage export agriculture. Under such circumstances, by 1994, studies in four of the country's departments indicated that fourteen percent of reform land had already been sold. In some cattle regions, almost a third of distributed land had been sold at prices ranging from fifty to one hundred dollars per acre (Nitlapán Team, 1994, 21).

In addition to the insecurity of land rights mentioned above, farmers are frequently selling because they no longer have access to credit through national banks. Credit is essential to the ability of small farmers to succeed as the nature of their work and income is seasonal. At the same time, the government and banks have allowed wealthy landowners to take out loans to purchase the plots. Bank officials admitted that ". . .as much as forty percent of these clients' production loans that is overdue has been 'detoured' to purchase these lands at 'give-away' prices (Nitlapán Team, 1994, 22)." The trend is once again towards concentration of land and wealth and an agro-export economy.

This has in turn led to increased colonization of the rain forest since 1990. At the end of the war, a number of demobilized contra rebels found plots for themselves at the border of the forest (Utting, 1993, 42). Farmers who sell redistributed land are following them, and more are likely to come if the undiluted support of wealthy, export-oriented landowners continues.

A final element of the colonization phenomenon which should be mentioned is that of the country's orientation towards agriculture in general. The agricultural sector is responsible for the majority of exports and employs many people (CIA, 1999, 5). If a greater variety of jobs were available in the cities, then there would be more economic options for those who have traditionally made their living as farmers. Currently, there are

a huge number of un- or underemployed people within the cities or upon their borders, many of whom have come from agricultural land rather than moving to the rain forest. The economic distribution in urban areas replicates that of the countryside, with the few who control most of the wealth relying on cheap, unskilled labor to make their factories function. More equitable economic development within cities would help their poorer populations, and could eventually ease rain forest colonization by drawing farmers there instead. In order for this to occur, there would, of course, have to be a corresponding investment in education to prepare individuals for the work-force. The above discussion has focused on agricultural land because the vast majority of forest colonizers are campesinos. In addition, the lack of jobs in the cities can be seen as a partial result of the country's detrimental focus on export agriculture as it has prevented investment in other areas of development. This, as well as the lack of funding for education, has been encouraged to a large extent by international lending institutions, as will be discussed further below.

In many ways, the issue of forest colonization is similar to that of resource extraction. When wealthy landowners produce export crops, it is for their personal enrichment. Like large companies in the rain forest, they rely on cheap labor. Accumulation of property by the wealthy forces people off of their land. They are forced to move, and the rain forest suffers an increase in inhabitants. Both the common people and the environment of Nicaragua are harmed, while a few élites expand their holdings. Such a trend was demonstrated statistically in the 1960s and 1970s when the gross national product of the country grew rapidly, but the rate of childhood malnutrition doubled (Gilbert, 1986, 90). The rates of rain forest colonization and resource extraction also increased in these decades.

CHAPTER IV

THE IMMEDIATE HOPE FOR CONSERVATION

While the rain forest has been threatened by large companies and individuals who live far from it, the most successful efforts at conservation have been undertaken by local communities. Both indigenous and mestizo groups have become active at a variety of levels, whether they simply attempt to live sustainably or take part in protests against export companies. The efforts and success of such groups will be discussed, as well as the essential role which international organizations may play when they join in solidarity with this movement. As with the issues of resource extraction and colonization, the roles of government policy, foreign countries, and international institutions as related to the issue will be specifically addressed in later chapters.

Indigenous Lifestyles and Emerging Movements

Throughout the world, there is an emerging recognition of the success with which indigenous groups have had in living sustainably within their environments. Land which is home to native peoples overlaps the remaining pristine ecosystems of the world with astounding regularity (Durning, 12/92, 15). This is primarily because most such groups view the future of their people as directly connected with the state of the land. They utilize the resources around them, but are careful not to over-exploit them, never taking so much that the environment is unable to recover. Many cultures are able to do this quite effectively because they have developed a deep knowledge of the land. Gadgil makes the distinction that while western science is able to quantify and describe specific species of an ecosystem, indigenous peoples have a thorough understanding of how different plants and animals interact as well as their uses. For example, they are aware of

how much of one species they may harvest from a specific site before it will effect other members of the ecosystem (Gadgil, 5/93, 151,154).

The Mayangna (or Sumu) group in the rain forest of Nicaragua is typical of indigenous groups around the world in these respects. The Mayangna have resided in the forest for centuries. Currently they number between five and thirteen thousand, spread between thirty rivirine villages (Godoy, 1994, 236). Traditionally, they depended upon hunting, gathering, and some farming to sustain themselves. Their technique of farming is quite different from that in the Eastern zones of Nicaragua, however. They cultivate foods such as pineapple, maize, beans, rice, sugar cane, cassava, and bananas as well as medicinal plants in a polycrop setting. After a few years of harvest, they allow the forest to essentially regrow, although villagers would come back to harvest fruit, and might plant species which attracted animals for hunting. This type of agriculture combined with some extraction from the forest has had almost no detrimental effect on the rain forest.

It is primarily within the past century that the Mayangna have come into contact with western civilization. Unlike the Miskito peoples on the Atlantic coast, who will be discussed below, they did not often work for emerging plantations, mines, or lumber companies. They would often actually move further into the forest when confronted with export companies and colonizers. Recently, however, some members of the communities have taken jobs transporting goods for mines and moved into new towns upon their outskirts (Godoy, 1994, 236). Their culture is increasingly threatened as their traditional habitat is encroached upon.

Like many other peoples, the Mayangna are now organizing to resist outside pressures. They have lobbied government and aid groups for greater access to education near their villages. Godoy explains the implications of this action: "Schooling and the ability to speak the language of the larger society increases the political leverage of indigenous communities, allowing them to defend better their interests against encroachers (Godoy, 1994, 234)." Specifically, they have organized to protest both

mining and lumber concessions in the rain forest. They joined with Miskito representatives, non-governmental organizations (NGOs), and mestizo community and religious leaders to defeat the SOLCARSA logging concession in 1998 (World Rainforest Movement, 2/98, 1). They are also protesting the RENAUSTRA gold mining operation at the edge of the Bosawas Reserve (Alexander von Humboldt Centre, 10/99, 1-4).

The second major indigenous group in Nicaragua is the Miskito. The Miskito live on Nicaragua's North Atlantic coast, and have traditionally depended on the sea for their livelihood, hunting and gathering food from the waters. While they do not reside primarily in the forest today, they have always lived at its edge, and it formerly covered more of their territory. Traditionally, they also traded extensively with groups such as the Mayangna by traveling upriver to their villages.

Since the turn of the century, the Miskito have been involved with and employed by both foreign and national resource extraction companies. They worked for the pine lumber companies which cleared coastal forests, found jobs in mines, and hunted the native sea turtles to near extinction when the global market opened up for them.

Nietschmann explains:

The erosion of Miskito control over their territory, resources, community, and economy occurred because Somoza used a subtle strategy of occupation: the first phase of the integration of Nicaragua's coast was economic and was accomplished through foreign companies that converted the autonomous communities and towns based on subsistence into Nicaraguan workers that depended on money (Nietschmann, 1995, 11, my translation from Spanish).

As the group was confronted with the forces of the global economy, they lost touch with their traditional lifestyle and the environment suffered.

While a smaller percentage of Miskito than Mayangna individuals continue to practice subsistence living, they have managed to conserve their surroundings to a greater extent than other coastal communities. Recently, they have also taken a more active stance towards protecting the environment. In October 1990, they joined with the

Nicaraguan Institute of Natural Resources and the Environment (IRENA) and international environmental and indigenous rights organizations to create the Miskito Coast Protected Area (Area Protegida Costa Miskita). The project encompasses twelve thousand square kilometers which the community has agreed to police against abuse of forests, wetlands, and reefs (Nietschmann, 1995, 2; Durning, 12/92, 34).

Environmental destruction has in addition inspired the formation of a guerrilla group among the Miskito. The Yatama, whose name signifies "descendants of mother earth," took up arms in July 1998 to protest of President Alemán's installation of a new governor in the northern Atlantic region. They felt that the governor would ". . .likely preside over the ongoing, ill-thought out concessions of the region's natural resources- concessions that threaten to destroy the RAAN's [North Atlantic Autonomous Region] already fragile eco-systems and local economies (CEPAD, 8-9/98, 10)."

Both the Mayangna and Miskito communities are recognized as autonomous communities by the government. The North Atlantic Autonomous Region (Región Autónoma del Atlántico Norte, RAAN) was created by the Sandinistas at the end of their period in power. After initial conflict with the group, the government recognized their right to partial control of resources in the area as well as self-imposed laws (Gilbert, 1986, 104). The implementation of this has not always been consistent however. For example, in the case of SOLCARSA, the government granted the largest concession in its history without consulting the RAAN council.

Some of the Mayangna communities are also protected as their territory falls within the Bosawas Biosphere Reserve. Biosphere reserves are recognized as areas in which indigenous communities are allowed to practice traditional hunting, gathering, and farming, while outside extraction is forbidden. Again, this protection is jeopardized by individual concessions, as in the case of the company RENAUSTRA, whose activities have taken place in the buffer zone of the reserve.

Mestizo Community Efforts

In addition to indigenous groups, local mestizo communities have begun to organize to protect their interests and the environment. Popular organizations first appeared in Nicaragua on a large scale under the Sandinista government (Cuenca, 1992, 57). A number of those in the countryside were designed to help farmers use land in a more sustainable manner. For example, in the late 1980s, a campesino to campesino training program began with the aim of training people in soil conservation, setting up tree nurseries, and using some polycrop planting. A number of farmers received instruction, and were then asked to spread the knowledge throughout their communities (Utting, 121, 1993). This type of program is important to the issue of the rain forests as it reduces the pressure for land.

Since the 1990s, while the government does not actively promote community organization, a number of groups have continued to operate. The aftermath of Hurricane Mitch was particularly illustrative in that over three hundred and twenty Nicaraguan organizations came together in the winter of 1998 to 1999 to form the Non-governmental Emergency Relief and Reconstruction Coalition. The hurricane had a disproportionate impact on the poor due to their location on flood plains and fragile slopes, and these groups felt that the government was not doing enough to aid their recovery. Hardy relates, "The hope [of the coalition] is to build a collaborative effort among organized communities, government, and international institutions while rewriting the rules of development to include issues of health, education, the environment, and quality of life (Hardy, 5-6/99, 2). It is groups such as these, especially when joined in solidarity, that put pressure on policy makers to address issues of deforestation.

Another strong community effort is taking place in the district of Cuá-Bocay. The Ben Linder Project began as a memorial to a graduate from the University of Oregon who was assassinated by contra troops while surveying the site for a small hydroelectric

project. Since that time, a dam has been completed which supplies the surrounding community with electricity. The most impressive part of the project is that former Sandinista and contra troops have come together in a conservation effort in the river's watershed. Residents are given the incentive of access to credit and agricultural supplies if they agree to cooperate with the program. In doing so, they agree not to clear croplands by burning and not to cut any trees. The community is thus encouraged to conserve surrounding forest, and it benefits directly through credit and electricity in return (Butler, 7/94, 32).

The Role of International Nongovernmental Organizations

Both indigenous and mestizo communities have received support in conservation activities from environmental and indigenous solidarity organizations. A number of groups have been integral in soliciting support from the international community, including the Nicaragua Network Education Fund, the World Rainforest Movement, the Worldwide Forest Biodiversity Campaign, the Nature Conservancy, Witness For Peace, Envio, and the Environmental Project on Central America (EPOCA). The Humboldt Center, mentioned above, deserves particular recognition. Located in the vicinity of Mayangna communities, it has aided them repeatedly in protest against transnationals and in publicity. The Indian Law Resource Center based in Washington DC also contributed considerable assistance to the indigenous protest of the SOLCARSA concession (Weinberg, 7/98, 1-3). Other projects have sought international aid through self-generated campaigns. For example, Ben Linder's family from Portland, OR actually toured the US for years on speaking tours to raise more than \$250,000 towards the Cuá-Bocay project (Butler, 7/94, 28). It would be impossible to list all of the groups which have contributed (as evidenced by the three hundred and twenty organizations who joined forces solely in the aftermath of Hurricane Mitch). It is important to note,

however, that some members of the international community are taking an interest in local organization in Nicaragua, and that this has made a positive difference for the forests.

The success of these organizations can be contrasted with the results of groups who have approached environmental protection from the top down. This has been a problem with some of the parks and reserves established by the government and funded by outside organizations. While protection exists on paper, the local community is often given no incentive to support the program, and may even be treated as threatening to it. Colchester notes, "Western attempts to promote natural resource conservation have . . . foundered on the unresolved conflict between local communities and state administration. Like forestry reserves, natural parks established on indigenous lands have denied local rights to resources, turning local people practically overnight from being hunters and cultivators to 'poachers' and squatters' (Colchester, 1993, 78)." Those interested in supporting protection of the rain forest in Nicaragua should therefore be sure that the projects they support involve an empowerment of local communities. As evidenced through the history of conservation efforts and considering the government's shortage of money for enforcement, the interest of such groups may be the only insurance that a project will succeed.

CHAPTER V

THE IMPACT OF POLICIES OF NICARAGUAN GOVERNMENTS

The Nicaraguan rain forest is directly threatened by resource extraction and colonization, and has benefited through the efforts of community organizations. Government policy has contributed significantly to both sides of this equation, and its role is particularly interesting as the country has undergone three distinct styles of leadership in the past thirty years. Nicaragua was under the rule of the Somoza dictatorship from 1934 to 1979. In 1979, the socialist Sandinista party came to power with a drastically different view of society and politics. Since 1990, moderate conservatives have directed the country, and again led it in a new direction. The politics of each of these groups have had a great influence on the fate of the forests.

It is fair to say that the Somoza government, which ruled the country until 1979, was an intolerant dictatorship. The National Guard was infamous for human rights abuses and atrocities towards those who opposed it. Corruption was also rampant, as evidenced by the Somoza family owning twenty percent of the national territory by the end of its reign (Karliner, 1/86, 2). The extent of corruption was demonstrated when an earthquake struck the country in 1972. While tens of thousands of Nicaraguans suffered severe hardship as a result of the disaster, the government stole millions of dollars of relief aid (Gilbert, 1986, 90).

While the rulers were unkind towards the masses of their own country, they were quite friendly with the United States and international trade partners. The US had actually placed the first Somoza in power (Pastor, 1987, 20-29). During the forty years in which they ruled, resource extraction and production of export crops reached all time highs (Gilbert, 1986, 89-90; Rice, 5-6/89, 65; Utting, 1993, 18; Collins, 1986, 107). Concentration of land in the hands of the few increased, sometimes with the help of the National Guard (Rice, 5-6/89, 65). This meant that colonization of the rain forest also

increased. It was in fact encouraged through the instigation of the Rigoberta Cabezas Colonization Project (Utting, 1993, 39). The government took no account of long term or environmental planning, and sought only immediate profit. In the 1960s and 1970s, Nicaragua lost approximately one hundred thousand hectares of forest per year, giving it the dubious distinction of the highest deforestation rate in the region (Utting, 1993, 10). By the end of the Somoza era, both the common people of Nicaragua and the rain forests were suffering greatly.

When the Sandinistas came to power, the attitude towards both the country's people and its resources and environment changed. The government demonstrated a concrete desire to protect the rain forest. Within their first month of control, the country's forests, which Somoza had previously granted through concessions to foreign companies, were nationalized. In reflecting on his role as a Sandinista, Zamorro identifies this as an exemplary achievement: ". . . It should never be forgotten that the Sandinista government firmly defended natural resources and wealth by nationalizing them. Our government officials cannot be accused of enriching themselves by giving concessions or trafficking in the country's dignity (Zamorro, 7/96, 29)." During the following month, the Nicaraguan Institute of Natural Resources and the Environment (IRENA) was created. Karliner explains that the ministry acted quickly, ". . .By 1982 IRENA had targeted eighteen percent of Nicaragua's national territory for national parks and reserves, including the largest pristine rain forest north of the Amazon basin, the ten thousand square kilometer Bosawas forest on the Honduran border (Karliner, 1993, 77)." While not all of the regions actually gained protected status, this was a significant leap from the one park which was protected prior to 1979 (Utting, 1993, 94). By the same year, the Rigoberta Cabezas Colonization Project was fully halted. In 1983, the Sandinistas went even further and officially limited food production in rain forest areas to subsistence crops, promoting the cultivation of crops such as coconut and cocoa which yield over long periods of time (Rice, 5-6/89, 67). Even as late as 1986, when funding was

extremely limited by the war, the president of the country Daniel Ortega proposed a peace park on the Costa Rican border. These plans were compromised when a concession was granted to a logging firm the following year, but it was canceled within six months due to pressure from the environmental community (Rice, 5-6/89, 69).

Aside from such direct actions, the Sandinistas favored the rain forest by promoting economic and political equality among the people of Nicaragua. One of their primary objectives in office was agrarian reform, and, as noted above, they successfully redistributed over four million acres (Nitlapán Team, 12/94, 21). They also focused on food sustainability through the PAN program which Collins discusses, promoting training programs in sustainable farming and widespread access to credit. These efforts virtually eliminated the pressure which was forcing people to colonize the rain forest prior to the revolution. In addition, the Sandinistas encouraged community organization throughout the country, which is one of their finest legacies. These groups have outlived the government and continue to fight for human rights and the environment.

Unfortunately, all of the Sandinista's projects were compromised and eventually ended by the economic embargo and the contra war. In addition to targeting commune members, the contras murdered more than thirty and kidnapped another seventy-five employees working in the environmental and forestry sector between 1983 and 1987 alone (Karlner, 1993,76). The cost of the war in dollars was staggering. For example, in 1986 the direct costs of the war equaled \$275.4 million, more than the total export earnings of the year, \$230 million (Central American Historical Institute, 10/87, 3). This does not even take into account the effect of the embargo. Nicaragua lost its largest traditional trade partner and was forced to take out high interest loans from Eastern Bloc countries (CEPAD, 9-10/94, 2). As a result of increasing economic stress, the budget for redistributive and environmental projects shrank. In 1988, IRENA lost most of its funding as well as its ministerial status (Utting, 1993, 44). The focus on the war also caused the Sandinistas to become increasingly centralized and lose touch with some of

the needs of their constituents. This might explain for example, the failure to recognize increasing dissatisfaction with the communal nature of land distribution (Cuenca, 1992, 14).

By 1990, the people were exhausted by the decade of war, and elected Violeta Chamorro of the UNO. The National Opposition Union was a coalition of conservative parties opposed to the socialist Sandinistas. Both Chamorro and the current president Arnoldo Alemán have led the country away from policies espoused by the previous government. They support a neo-liberal economy and integration into the world market. This has implied a return to concessions within the forest on a grand scale and export agriculture, which in turn prompts colonization. Nietschmann notes that while ecosystems in the North Atlantic Region had somewhat recovered during the period of the Sandinistas, in the 1990s a plethora of plans and activities commenced to "pillage" natural resources (Nietschmann, 1995, 1).

In one positive move, IRENA did regain its ministerial status with the change in presidents. The protected status of parks and reserves has also been maintained on paper, but they are increasingly threatened as the government searches for easy income through concessions to feed its tight budget. In addition, there is very little money for enforcement. For example, IRENA is only able to patrol one seventh of the Bosawas Reserve (Utting, 1993, 94). Alemán's ban on the sale of hardwoods, while not effectively enforced, was another step in the right direction. Its repeal less than one year later, however, is discouraging (Mueller, 9/99, 1).

The change in government policy since 1990 has corresponded with an increase in deforestation. The overall rate of deforestation, while it slowed during the 1980s, is again above 100,000 hectares per year (WRM, 10/99, 1; Langelle, 10/99, 3).

Although community groups are still more free to operate than they were in the time of Somoza, the lower class as a whole has also suffered a decrease in assets and power since 1990. It is difficult to conclude that people were best off under the Sandinista

government as they experienced a long war. However, it seems fair to say that had that government been given a chance to realize its goals, both the needs of the country's majority and the environment would play a much larger role in policy making. Hopefully the current leadership will eventually discard its automatic disdain of previous socialist programs and reevaluate the positive long-term benefits which some of them might have. This being said, it is valid to note that the current government is in a very difficult position economically, having inherited one of the highest per capita debts in the world. Its relationship to international lending institutions and trade partners has played a large role in determining policy.

CHAPTER VI

THE INFLUENCE OF THE INTERNATIONAL COMMUNITY

Since the colonization of the Americas, Nicaragua's fate has been influenced by the international community. This involvement has taken a variety of shapes and magnitudes. In the past century, military involvement by the United States has been a significant factor. The roles which world trade and world banking have assumed has possibly become even more important. Today, the country is inextricably linked to the US and other countries through the exchange of products and debt. These issues have helped to determine government policy and created the phenomena of export agriculture and resource extraction for foreign sale. Although it is a responsibility seldom accepted or even recognized, the international community has much to do with the current situation of Nicaragua's people and forests.

Military Involvement By the United States

The United States has intervened both militarily and economically in Nicaragua. Military involvement by the US began early. In 1855, an American entrepreneur named William Walker invaded the country with the backing of private firms and set up a puppet regime which was recognized by the US government (Gilbert, 1986, 89). The United States later aided in the overthrow of José Santos Zelaya in 1909, having become frustrated with his attempts to build a canal through the country with Britain's backing which would have destroyed US prospects in Panama (Hoyt, 1997, 7). The most significant military intervention in Nicaragua, however, occurred only two decades ago in the support of contra troops against the Sandinista government.

The United States supported the contras with both funding and military training. Throughout the first years of Sandinista rule, funding for the war came from congress. When congress voted to stop financing the conflict, the CIA sold weapons illegally to Iran

and used the profits in Nicaragua. Training was conducted either by CIA representatives in the field, or at the US funded Army School of the Americas. The United States also attempted to recruit additional supporters within the country. For example, the CIA released a manual on sabotage techniques for the average Nicaraguan. The "Freedom Fighter's Manual" contains instructions on how to make weapons such as the "Molotov Cocktail," and the advice that "there is an essential economic infrastructure that any government needs to function, which can easily be disabled and even paralyzed without the use of armaments or costly and advanced equipment, with the small investment of resources and time (CIA, 1985, 1)."

The contribution of the United States to the contra effort was quite successful in damaging the Sandinista effort. The contras' broad labeling of military targets frightened those who benefited or worked for government projects in any way. In 1986, Collins observed, "Three years ago when I asked small farmers what they most wanted, the usual response was tractors. Now more often they answer guns- to defend their farms and homes (Collins, 1986, 148)." As mentioned above, the economic cost of the war was also staggering. At the end of the war, the Sandinistas brought a suit against US aggression before the International Court at the Hague. The court found that the United States should compensate Nicaragua in the amount of \$17 billion for damages and injuries suffered in the war. The United States has refused to recognize the court's authority (Cuenca, 1992, 10).

The US also enforced an economic embargo against the Sandinista government. Trade relations with the country were closed. The United States also prevented lending, blocking approximately \$200 million in noncommercial development credits between 1981 and 1984 alone (Gilbert, 1986, 105). Important environmental studies and projects which were supported by USAID and conducted throughout the region also failed to come to Nicaragua (Utting, 1993, 42). Cuenca, who was head of the Ministry of Foreign Trade for the Sandinistas, explains, "There wasn't a clear understanding that our enemy

was much more powerful with its diplomatic and economic actions than with its military maneuvers (Cuenca, 1992, 36).

Utting states the case more severely: "The war in Nicaragua placed the Sandinista government in an economic strait-jacket which made any movement upon a sustainable path virtually impossible (Utting, 1993, 167)." Projects meant to aid the Nicaraguan people or to protect the rain forests lost their funding as more and more money went to the war. In the end, the Sandinista experiment was defeated. In response to this defeat and other US involvement in the region, Karliner writes,

If the United States continues to undermine all efforts at structural change that might allow a more socially just, economically viable, and ecologically sound development model to emerge in Central America, the United States will also continue to undermine the very stability it claims to be seeking in Central America (Karliner, 1993, 79).

Even the conservative, neo-liberal leaders who followed the Sandinistas in 1990 have suffered as a result of US aggression. Nicaragua's debt doubled during the 1980s, and it is this government which is forced to pay interest on the loans. While war and environmental issues are not frequently linked, the US war against the Sandinistas had a detrimental effect on the rain forest in that it halted conservation and sustainable development projects. It practically forced the return of power to neoliberal conservatives.

International Lending, Trade, and "Aid"

Aside from military interaction, Nicaragua is most influenced by the international community by trade and lending. Nicaragua's trade relations with the United States are typical of those it has with most northern countries. The US purchases agricultural products, raw resources, and manufactured items made by unskilled workers in factories while selling luxury items for the upper class of the country. Extraction companies from the United States have also established themselves in Nicaragua to remove resources

directly, sometimes from within the rain forest. Such trade has not encouraged sustainable development in the Nicaragua, but rather its exclusive focus on agricultural plantations, cheap labor, and sale of raw resources to earn money. The only nontraditional area of trade which has significantly expanded in recent years has been in the "maquiladora" factories in urban settings. These plants produce textiles and clothing for sale abroad through the use of cheap labor.

In the 1960s, the United States initiated the Latin America wide Alliance For Progress, meant to "aid" countries in development. The Alliance encouraged expansion of export agriculture in Nicaragua from the west across its diverse landscape (Karliner, 1993, 74). It also encouraged increased raising of cattle, which subsequently exploded in the country. Agrarian reform was included as part of the plan to diffuse revolutionary discontent. The type of agrarian reform which the plan favored, however, was forced relocation of the Nicaraguan campesinos in the rain forest; the Rigoberta Cabezas Project was an ideal solution (Utting, 1993, 39). The Alliance For Progress essentially enforced the pattern of trade which had emerged over the past century and still exists today.

While its approach has not always been consistent, the United Nations has similarly encouraged current trade relations. The Food and Agriculture Organization (FAO) within the United Nations, has long favored grassroots agrarian reform in theory. In 1979, it convened a World Conference related to Agrarian Reform and Rural Development. Colchester summarizes the conclusions: "Recognizing that two decades of development had failed to benefit the rural poor and that 'trickle down' had not worked, the conference expressed an international commitment to 'growth with equity' and formally endorsed what it called the 'Peasants' Charter' (Colchester, 1993, 296-297)." Since that time, however, the issue of land reform has been avoided within the organization and it has, in fact, encouraged the production of export crops which only exacerbates inequity (Colchester, 1993, 296, 300).

Nicaragua's position in the world market is of course favored by trade organizations as well. The country is a member of the World Trade Organization (WTO), and has been encouraged in recent years to further reduce tariffs and trade barriers. This promotes the presence of resource extraction companies within the country. It might also make it difficult for Nicaragua to develop in new areas such as technology as its products will face immediate competition with those of countries who have long funded such development. George comments,

Equally urgent is the task of addressing the United States administration's obsession with 'free trade'. . . 'Free trade' sounds, perhaps, fair and democratic but will inevitably place further stress on the environment and working people everywhere. All countries must compete to offer the most attractive, least regulated conditions to transnational corporations (George, 1992, 31).

Nicaragua has experienced some economic growth through trade, but has failed to develop the diverse economy which might relieve pressure from its natural resources or allow the middle class to expand. Increased trade without development will only further endanger the nation's people and forests.

An issue which is closely linked to trade is that of lending and debt. The World Bank's promotion of traditional trade relations has been almost as strong as that of the WTO. This has occurred in spite of the fact that, like the UN, it once recognized that land redistribution in third world countries was necessary to protect the interests of the poor (Colchester, 1993, 304). The World Bank is also, ironically, the largest lender to underdeveloped countries for forest conservation in the world. Recently, it set a goal of bringing 50 million new acres of forest under protection by the year 2005 (World Wildlife Fund, 7/97, 1). Nonetheless, it has lent heavily to export agriculture and livestock schemes, as well as supporting "development" of natural resources such as lumber and ores. The practices of the World Bank are significant in themselves, but also important in that they set a standard for other organizations and countries to follow. The

Inter-American Development Bank, for example, is taking its lead in financing the impending development of Nicaragua's oil reserves (Eisen, 5/99, 101).

Equally important to what the World Bank funds, have been the policies which it and the International Monetary Fund (IMF) impose on indebted countries. In recent years, the World Bank, at the request of the United States and private banks, has required that heavily indebted nations comply with policies of structural adjustment. Hostetler explains, "These reforms require that governments prioritize export production, eliminate trade barriers, remove restrictions on foreign investment and balance their budgets, mostly through cuts in public spending (Hostetler, 1995, 6)." In addition, structural adjustment requires countries to focus on their comparative advantage in the world market, which can be translated in Nicaragua to mean cheap labor and a tropical climate (Hostetler, 1995, 6). It is also, of course, of primary importance that countries make the interest payments on their debt.

Both Violetta Chamorro and Arnoldo Alemán have agreed to structural adjustment. They have had no choice but to go along with the program or lose the possibility of loans or aid from most of the world. This has meant huge cuts in public spending. Not only have education and health care programs been sacrificed, but the ability to enforce the protected status of the rain forest parks and reserves has all but disappeared. The availability of credit to small farmers has also diminished, increasing the vulnerability of their claim to agricultural land. This is exacerbated by the World Bank's, and hence the government's, direct promotion of export agriculture. While small farmers are suffering, wealthy owners of export plantations are actually receiving incentives to continue their lucrative business. Again, the country has also been encouraged to open its borders to transnational corporations which pillage resources within the rain forest. The requirement that Nicaragua focus on its comparative advantage in cheap labor denies the possibility of building a skilled labor force and

developing in new fields. Structural adjustment leaves very slight space for sustainable, long term planning or environmental protection.

Theoretically, by complying with such policies, Nicaragua would benefit by paying off its international debt. Unfortunately, this possibility is highly unlikely. First of all, most poor nations throughout the world are struggling to comply with structural adjustment at the same time. All are attempting to produce mass quantities of export products quickly, thereby flooding the global market with food products and raw resources and driving prices down. Nicaragua is not getting the prices it could for its products. Secondly, the size of the country's debt is astounding. It began to accumulate during the Somoza regime, in which much loan money was diverted into the pockets of officials. It then more than doubled during the Sandinista period due to both missed payments on previous debt and high interest loans taken out with Eastern Bloc countries (Cuenca, 1992, 42). A short time ago, the debt service ratio was the highest in the world, at 92%. This signifies that 92% of Nicaragua's yearly export earnings were marked for interest payments (George, 1992, 14-15). As Kahn identifies, debt creates "myopic" behavior, forcing countries to focus on short term economic gains in the hope of paying off loans (Kahn, 1994, 66). This is especially true when the World Bank forcibly endorses such activities. Nicaragua's debt is so high, however, that its myopic behavior has not even reduced the size of the debt. Through its own efforts, it has merely met interest payments on borrowed funds.

A partial solution to this dilemma would be either "debt for nature" exchanges or debt forgiveness. Debt for nature swaps involve the forgiveness of debt in exchange for countries placing more land under protected status and enforcing this status. This is an excellent idea if countries are truly held accountable for enforcement. In my research, I was unable to find an example of this exchange occurring in Nicaragua.

Debt forgiveness is surprisingly more common. A number of people around the world have joined in the Jubilee movement to demand that debt be erased (CEPAD,

8-9/98, 8). While this has yet to happen, nearly half of Nicaragua's debt was forgiven in 1995 and 1996 (US Embassy Managua, 3/98, 3). In addition, after Hurricane Mitch struck in the fall of 1998, Cuba, France, Austria, Spain, and Brazil each forgave Nicaraguan debt to their countries (CEPAD, 11-12/98, 8). The United States also demonstrated sympathy by agreeing to a moratorium on debt servicing for two to three years. This moratorium came with conditions, however. The Declaration of Antigua, which was signed by the United States and Central American countries, states, among other stipulations, "As we approach the new millennium, we are determined to rededicate our commitment to open markets and to strengthen even more this mutually beneficial relationship (Declaration of Antigua, 3/99, 4)." Nicaragua's debt, while reduced and temporarily postponed, is once again forcing the government to bow to the economic policy of the United States.

It seems fair to say that the relationship of Nicaragua to the outside world has taken power away from its people. Warfare prevented the country from choosing its form of government in the 1980s and implementing sustainable policies. Trade and lending have in turn largely determined the pattern of economic growth. This pattern is one which has led to a widening gap between the country's wealthy and poor as well as the destruction of the rain forests.

CHAPTER VII

EMPOWERMENT OF THE NICARAGUAN PEOPLE:
A MULTIFACETED SOLUTION

The issue of rain forest destruction in Nicaragua is very complicated. There is no one solution which would simply guarantee the forest's protection. This has been the hope too often of those who favor the creation of reserves and yet fail to consider the forces behind deforestation. If the rain forest is to be saved, these pressures must be addressed.

While they have differed in their specific manifestations, such forces share a common element. Deforestation has been closely tied to local people's loss of control over their environment. Both the Mayangna and Miskito indigenous groups traditionally lived in harmony with the land, but they and the forests were exploited when they came into contact with Western Civilization. Similarly, campesinos were formerly able to practice subsistence farming on the Pacific plains of the country with little detriment to the environment. The concentration of these lands in the hands of the wealthy few has stripped them of the ability to do this and forced people to move to the rain forest's borders. The main group which has profited from deforestation has not included local indigenous or mestizo communities. It has rather been comprised of transnational corporations who sell the harvested resources abroad.

On the contrary, the few initiatives for rain forest protection which have experienced success have been supported and often initiated by local peoples. Communities have come together in support of sustainable farming as well as in protest of transnational corporations. Such groups fight for their own future livelihoods through fighting for environmental conservation.

This pattern has been replicated in governmental policy. The Sandinistas, who based their policies on protecting the interests of the majority, fought to safeguard the rain

forest both specifically and indirectly. Indirectly, they slowed colonization by seeking more equitable distribution throughout the rest of the country. Specifically, they placed areas of the forest under protection because they recognized the future value forests would hold for the people as a whole. On the other hand, Somoza and the current neoliberal leaders have valued the interests of the wealthy few. They have sought short term profit through production of export crops and sale of the country's resources. Protection of both people and the environment has virtually disappeared.

On a larger scale, the loss of national power to internationals has been similar to the loss of local power to wealthy individuals. When the United States involved itself militarily, it took the ability away from the Sandinistas to enforce environmental policy. The current relation of the country to the outside world based on debt and traditional trade is encouraging Nicaragua to focus on short term profit, allow the accumulation of wealth by the few, and ignore human rights and environmental issues. Local peoples have lost much of the ability to control their resources.

The international community, government, and rain forest peoples are each tied to the destruction of the rain forest. Each must play a role if the forests are to be saved. At a local level, practice of sustainable farming, protest against transnationals, and struggle for the right to greater determination of resource use should continue. This has been and should continue to be supported by international environmental and human rights organizations. It is when the largest number of interest groups join in solidarity that they have the greatest power to effect change.

The government needs to place more value on long term planning. While sale of resources provides an immediate but moderate cash flow, the loss of the rain forest implies the loss of an ecosystem which could generate income endlessly through lower intensity use. It would also be valuable if the projects of the Sandinistas were reevaluated by those currently in power. While the political force behind land distribution has disappeared, there is no reason that the government could not benefit from programs such

as partial food self-sufficiency. The Sandinistas determined, after all, that this could actually benefit the nation economically as a whole (Collins, 1986, 111). Accountability is another important issue. Government officials have been known to accept bribes in exchange for ignoring the illegal sale of resources such as hardwoods. If more money were allocated for enforcement, then individual employees could receive higher wages and have a greater incentive to refuse to profit on the side. Perhaps most important, the government should realize that economic development is important, but not when it is the mere growth which has occurred over the past decade. The country needs to get away from its consistent sale of resources and cheap labor on the world market. Public investment in education rather than broad cuts in public spending would create a more skilled work-force, and allow the country to build a more diverse economy as opposed to relying on export agriculture. If this fails to happen, then people and the forests will continue to be abused to the benefit of transnationals and distant consumers.

The international community also has a large role to play in protecting the rain forest. The issue of debt is problematic. Debt hurts the common people and environment of Nicaragua, but the possibility of forgiving debt globally may not be practicable. Debt for nature swaps are a good idea, and could be implemented by the World Bank as a means of financing forest reserves. Fortunately, some of Nicaragua's debt may also be postponed through the Highly-Indebted Poor Country (HIPC) initiative recently implemented by the IMF (US Embassy Managua, 3/98, 3). In addition, the United States might consider forgiving its portion of Nicaragua's debt, as it can be seen in relation to the \$17 billion which the US still owes Nicaragua for its actions in the contra war. A reduction in debt through such means would give the country more space in which to experiment in building a more diverse economy.

More importantly, international lending institutions, if they truly value forest conservation (as it would seem the World Bank does based on its investment in this area) should reevaluate how their other policies are effecting such forests. Structural

adjustment programs encourage cuts in public spending which reduce funding for education and environmental programs. These are two areas which demand greater investment if Nicaragua is to proceed on a sustainable path. Lending agencies should also finance diverse and nontraditional development projects rather than continuing to fund mining and export agriculture schemes.

As citizens of the United States, we too can act to conserve the rain forest. We can demand greater transparency in international organizations such as the World Bank and the WTO, as was done at the recent protests in Washington DC and Seattle. Since our country plays such a powerful role in these groups, we should know what their actions are so that we might influence them. If we do choose to support environmental protection financially, we should be sure to contribute to groups which involve the local community in forest protection. Our greatest power, however, may be as consumers. It is possible to ascertain where food, lumber, and other products originate. In order to protect rain forests, we should boycott hardwoods and ores extracted from them as well as agricultural products and beef raised on export plantations in Nicaragua. On the contrary, we should purchase products harvested or created in a sustainable manner by people of Nicaragua. Such items might include fruits, nuts, and other non-timber products harvested from the forest, agricultural products cultivated in a polycrop setting, or goods manufactured through fair use of labor.

It is doubtful whether all of the above suggestions could come to pass. Conversely, it is equally certain that the list is incomplete, and that peoples working for justice and environmental protection within and outside of Nicaragua will discover additional means of saving rain forests. It should also be clarified that simply giving greater power to individuals in Nicaragua and in the forest does not guarantee that such power will be put to positive use. It is exceedingly evident, however, that the continuous dissolution of local control over resources has led to the destruction of the environment.

While it is not the complete answer to deforestation, the empowerment of local peoples is necessary if we hope to save the rain forest.

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