

ALL THAT GLITTERS IS NOT GOLD

BALANCING CONSERVATION AND DEVELOPMENT IN VENEZUELA'S FRONTIER FORESTS

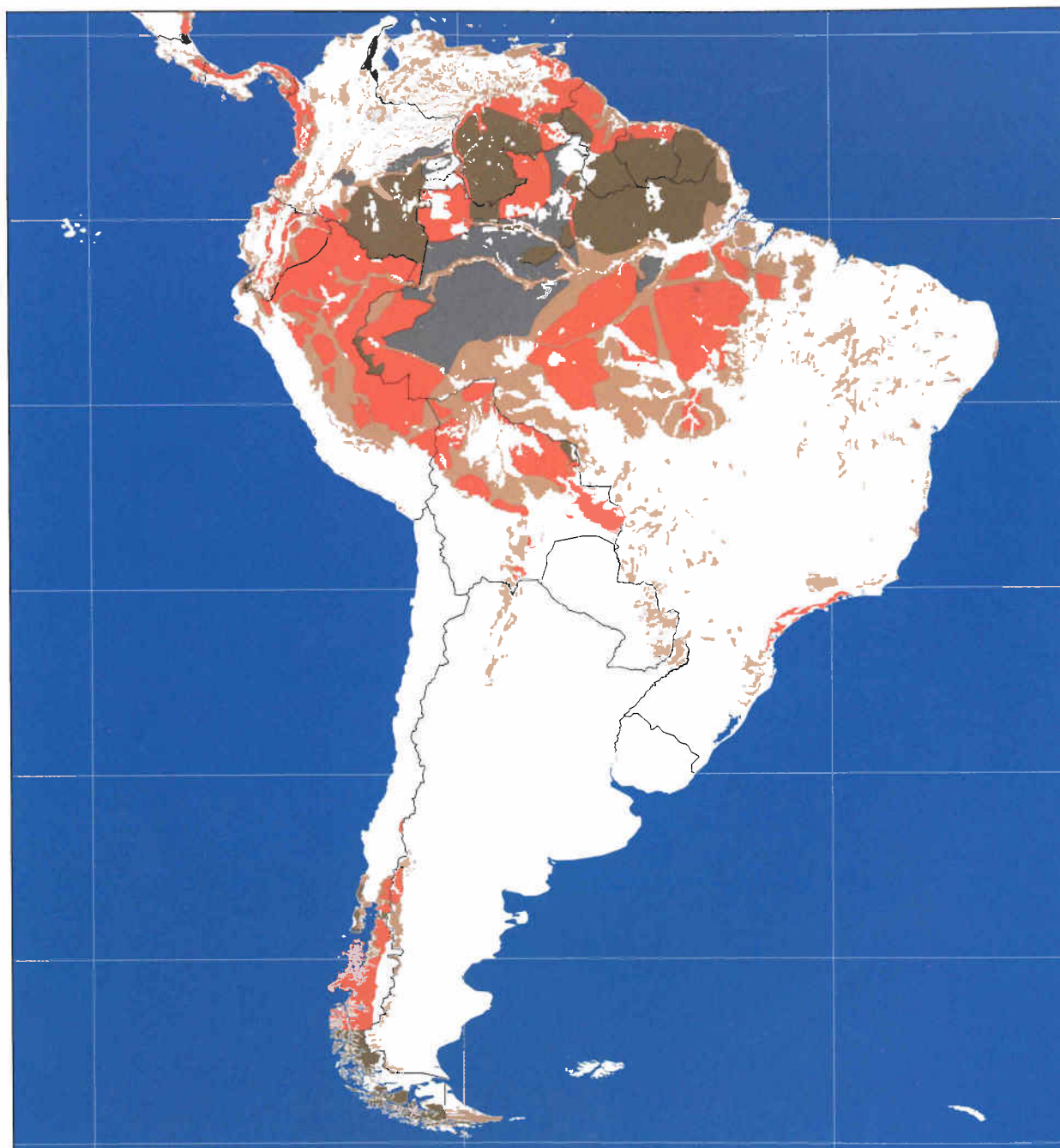
MARTA MIRANDA, ALBERTO BLANCO-URIBE Q., LIONEL HERNÁNDEZ, JOSÉ OCHOA G., EDGARD YERENA



WORLD RESOURCES INSTITUTE

FOREST FRONTIERS INITIATIVE

FIGURE 1. THREATENED FRONTIER FORESTS OF SOUTH AMERICA



FRONTIER FORESTS UNDER LOW OR NO THREAT:
large, intact natural forest ecosystems that are relatively undisturbed and large enough to maintain all of their biodiversity.

FRONTIER FORESTS UNDER MEDIUM OR HIGH THREAT:
ongoing or planned human activities (e.g. logging, agricultural clearing, mining) will, if continued, significantly degrade these frontiers.

NON-FRONTIER FORESTS:
secondary forest, plantations, degraded forest, and patches of primary forest not meeting this study's criteria as frontier.

FRONTIER FORESTS UNASSESSED FOR THREAT:
insufficient information prevented evaluating the threat level of these frontiers.

Source: D. Bryant et al., *The Last Frontier Forests: Ecosystems & Economies on the Edge* (World Resources Institute: Washington, DC, 1997).



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BY MARTA MIRANDA

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A Contribution to the
Forest Frontiers Initiative

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FOREWORD

Over the next several years, Venezuela will make choices that will determine the fate of half of the country: the fragile rainforest region south of the Orinoco River. One path leads to high economic, social, and environmental costs, another to broad benefits that can be sustained.

Venezuela's economy is fueled by oil, which provides over 75 percent of the nation's export earnings and has helped finance major forest conservation efforts in the southern part of the country. But declining oil prices and a weakened economy have left at least 50 percent of the population in poverty and created a burden of massive external debt. Partly to reduce their vulnerability to oil-price fluctuations, Venezuela's policy-makers currently are considering opening up the relatively untouched region south of the Orinoco River to logging, gold mining, and other large-scale extractive development.

Venezuela's southern forests are part of the Earth's last large un-fragmented forest blocks — "the Guiana Shield" formation. Though not providing the instant wealth promised by gold, these forests nevertheless are gold in another form — treasure troves of biodiversity and natural services that, if properly managed, can provide substantial economic returns indefinitely. Such ancient forests are found in only a few other nations on this geographic scale: Brazil, Suriname, Guyana, Canada, Colombia, Russia, and French Guiana. As such, they are an irreplaceable part of the Earth's natural heritage.

Is there a way to conserve these resources while at the same time fostering economic growth? This report argues that mining and logging have an important role to play in Venezuela's economy, but that the development policies now being considered for the region will produce less economic returns and greater environmental degradation than other alternatives. For example, small-scale gold mining produces up to \$100 million in gold annually that is untaxed, while logging royalties capture only 3 percent of the total value of the wood. Eliminating subsidies on logging, opening future mining and logging concessions to a competitive bidding process, and considering new options for financing forest conservation initiatives could help reduce the conflicts between environment and development.

In seeking rapid economic growth, Venezuela's leaders have not yet put in place a clear policy on environmentally responsible mining and reclamation. For development to be sustainable, forest policies must be updated, environmental monitoring established, customary land rights legally acknowledged, and current environmental regulations strictly enforced. Part of this effort should include more active public participation and longer-term resource planning for the region. These steps are not without costs and will take time to implement, but without them the prospects for sustainable development are bleak.

This report is the latest in a series produced by WRI's Forest Frontiers Initiative (FFI), a five-year, multi-disciplinary effort to promote stewardship in and around the world's last major frontier forests by influencing investment, policy, and public opinion. WRI is pleased to acknowledge the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Netherlands Committee for the IUCN for their support of this project. We also want to thank AVINA Foundation, Phoebe W. Haas Charitable Fund, Sacharuna Foundation, The Wallace Global Fund, The Turner Foundation, the U.S. Environmental Protection Agency, Netherlands Ministry of Foreign Affairs (Development Cooperation),

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In Venezuela, as in the other forest frontier nations, we believe that the mutually reinforcing goals of development and conservation can go hand-in-hand. It is an outcome that is vital not only for the people of Venezuela, but for the rest of the world as well.

Jonathan Lash
President
World Resources Institute

MAJOR FINDINGS

The forests of Venezuela's Guayana region, part of the world's largest tropical forest frontier, hold enormous opportunity for careful stewardship and long-term conservation. Until recently, Venezuela has avoided large-scale extractive activity in this region, partly because of government policy that focussed on oil development in the north of the country. However, the uncertainty of oil revenues and a series of short-term economic crises have led policy-makers to reconsider opening up the south to large-scale extractive development. This study focusses on the implications of such development for long-term conservation of the region, identifying three major challenges for the country to address if it is to develop careful stewardship of its last intact forest heritage:

1. *The benefits from logging and mining are not being fully captured at the national or local levels.*

- Small-scale gold miners produce an estimated \$50 million to \$100 million worth of gold per year, but pay no taxes.
- Royalties on logs cut by local timber companies capture only 3 percent of the total value of the wood cut.

2. *Logging and mining currently cause considerable negative environmental and social impacts in the Guayana region.*

Small-scale mining has resulted in increased sedimentation, mercury contamination, and conflict with indigenous communities. Logging has contributed to habitat fragmentation and declining biodiversity in some areas. Two of the primary reasons for these negative impacts are:

- Lack of government capacity to monitor extractive activities in the field. Only four Ministry of Environment personnel directly monitor logging and mining across over 3 million hectares of the Guayana region.
- Conflict among government ministries and agencies. Efforts to conserve forest resources are generally not coordinated across government institutions as long-term conservation priorities have not been clearly integrated.

3. *Expansion of logging and mining activity is likely to bring fewer benefits and higher environmental and social costs than expected.*

The area under logging concessions has increased significantly in the last decade. Mining has also been given priority in government development policy, and large-scale mining has been specifically targeted as the favored option. This could pose a potential problem for the region's forests and people because:

- Venezuela has no standards for reclamation of industrial mining sites, and performance bonds are not set to take into account the full range of potential post-mining environmental impacts.
- Government plans to stimulate mining and timber production are not accompanied by adequate capacity for environmental regulation and oversight.

MAJOR RECOMMENDATIONS

Mining and logging have an important role to play in Venezuela's economic recovery. However, to ensure a long-term sustainable future for the people of the Guayana region, policy-makers should consider implementing the following measures:

1. *Capture revenue from forest resources and ensure that benefits contribute to long-term forest conservation.*

Additional revenue could be captured from activities already occurring in the Guayana region if changes in policy were considered, such as:

- Eliminating subsidies on logging, and establishing an open bidding process for future mining and logging concessions, as well as concession contracts for park services.
- New options for financing forest conservation initiatives to protect critical forest ecosystems under the Clean Development Mechanism of the Kyoto Climate Protocol.
- Ensure that entrance fees for national parks, and water and electricity charges reflect the cost of managing watersheds.

2. *Minimize the environmental and social impacts from mining and logging.*

Before increasing the pace of mining and logging in the Guayana region, priority should be given to decreasing environmental and social impacts from extractive activities, through the following actions:

- Enforcing current environmental regulations before expanding extractive activities.
- Enacting a moratorium on new mining and logging contracts until there is a clear policy on environmentally responsible mining, reclamation standards have been developed for mining, and forest policies have been updated.
- Conducting baseline studies to gather information on the forest ecosystems of the region, so that possible environmental impacts can be monitored and measured against a scientific yardstick.
- Developing an "early warning" monitoring system to minimize environmental and social impacts while increasing the capacity of government to provide more effective oversight of extractive activities in forests.
- Requiring that companies post performance bonds that adequately reflect potential environmental and social costs.

3. *Consider new arrangements for forest resource use based on public participation.*

Part of ensuring a sustainable future for the Guayana region would include more active public participation and longer-term planning for natural resource conservation and use. Specifically:

- A regional land-use plan based on managing the region at a landscape scale, including participation of local communities, local governments, ministry officials, non-governmental organizations, and universities.
- Demarcation of indigenous territories in consultation with indigenous communities, and consideration of new collaborative arrangements between parks personnel, other government agencies, and indigenous communities.
- Public disclosure and discussion of government plans, such as the environmental impact assessment of the Guri transmission line, or forest management plans.

I. INTRODUCTION AND POLICY BACKGROUND

A recent study published by the World Resources Institute (WRI) mapped the last large blocks of intact frontier forest on a global scale, and identified those that can be characterized as threatened. Eight countries were identified as having enough forest left that, given careful stewardship most of the original forest cover could be conserved. They are: Brazil, Venezuela, Russia, Colombia, Canada, Guyana, Suriname, and French Guiana. Globally, Venezuela ranked fourth among countries with the highest plant biodiversity in their forests; an estimated 75 percent of the country's plant species are found within Venezuela's frontier forests.¹ However, frontier forests of South America are threatened by logging, mining, oil exploration, and the development of new roads (see Figure 1).²

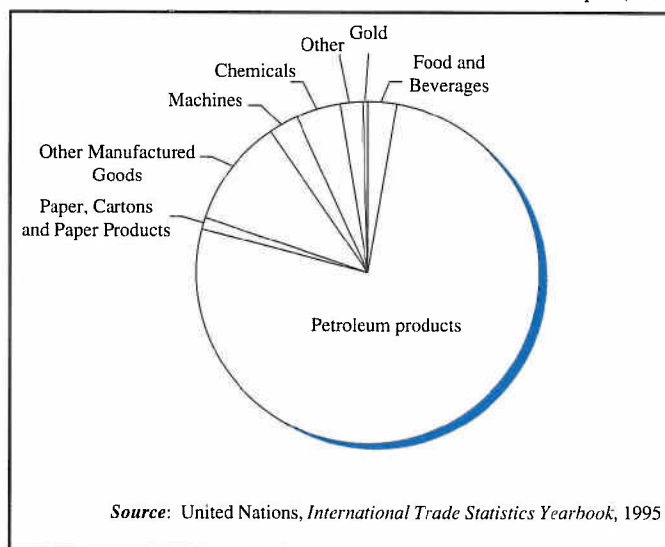
The forests south of the Orinoco River, also known as the Guayana region, were identified by WRI as Venezuela's last large block of intact forest, part of which is threatened by ongoing extractive activities.³ Venezuela contains many species found nowhere else in the world, making it one of the most biologically distinctive countries in the Western hemisphere.⁴ The country also has other valuable resources, such as gold, diamonds, bauxite, timber, hydropower, iron, and oil, which if used judiciously could provide livelihoods for generations of Venezuelans. For years, the country has focussed its development on oil exploration, with the oil sector representing over 75 percent of total export earnings (see Figure 2). In fact, Venezuela is Latin America's largest oil-producing country and ranks as the world's seventh largest producer. It is also the number one foreign provider of oil to the United States, surpassing even the petroleum-exporting giant, Saudi Arabia.

Coupled with a population concentration in the north, the country's oil revenues have contributed to a comparatively progressive history of forest conservation in the south, especially relative to other Latin American countries. Nearly 30 percent of Venezuela's national territory can be categorized as partially protected, a greater proportion than any other country in Latin America.⁵ The portion that remains strictly protected includes a representative sample of many of the country's ecosystems and constitutes over 15.5 percent of national territory. Even the United States, with the longest history in the Western hemisphere of formal national park systems, has delineated only approximately 7 percent of its national territory as strictly protected.⁶

But oil prices are not economically stable; the price of Venezuelan crude oil has fluctuated greatly within the last fifteen years (see Figure 3). With so much of the country's welfare riding on the price of oil, the latest in a series of oil price crashes has dealt a severe blow to a majority of Venezuelan citizens. At least 50 percent of the population is now living in poverty⁷ and policy-makers find themselves facing a \$37 billion external debt, representing 58 percent of the country's gross domestic product.⁸

FIGURE 2

Venezuela: Exports, 1995



Such a serious economic scenario has prompted policy-makers to reconsider opening up the south for large-scale extractive activity. Measures contemplated in the current administration's five-year plan were directed, in part, at developing the fragile rainforests south of the Orinoco River. This would be accomplished by stimulating logging and mining, adding transportation arteries, increasing agricultural production, and promoting the establishment of new settlements along the nation's frontiers with Brazil, Colombia, and Guyana.⁹ In addition, proposals to lift bans on mining and logging in Amazonas State (*see Box 1*), and a new mining law designed to stimulate foreign investment in the gold and diamond mining sector have also been considered.

While the move to develop Venezuela's logging, mining, and hydroelectric sectors could help overcome the instability created by its reliance on oil exports, there are serious risks as well. Capturing the benefits of the activities contemplated in the development plan will require careful coordination so that the environmental impacts of one activity do not negatively impact the potential development opportunities of another. For example, if logging and mining result in extensive deforestation, these activities could damage the nation's potential to attract nature tourists or to provide electricity for neighboring countries.¹⁰

This report analyzes these plans, taking into account the realities of current forest resource use and the possible environmental and social implications of increasing the intensity of resource extraction in the frontier forests of the Guayana region. The point of the report is not to suggest that mining or logging should be halted, nor does it attempt to delineate precisely where these activities should take place. Rather, the main findings indicate that until now the government has failed to capture the economic benefits of mining and logging in the country's forests. Furthermore, Venezuela's development model has resulted in potentially avoidable costs to the region's people and environment, primarily because the government lacks the capacity or resources to

implement even those environmental regulations that exist. Thus, the study suggests that the apparent trend toward increasing extractive resource use in the Guayana region could deepen existing negative environmental and social impacts, currently far in excess of the impacts caused if best practices were used. Securing a long-term sustainable future for the forests and people south of the Orinoco river would require a more integrated approach to managing the forests of the region, as well as policies that consider a variety of forest resource values rather than favoring the development of one extractive resource.

1

A BATTLE FOR THE PROTECTION OF NATURAL RESOURCES IN AMAZONAS

Until 1993, Amazonas was a federal territory, managed centrally through the country's capital, Caracas. Under new initiatives to decentralize government responsibility, Amazonas became a state, with its own governor. The state is home to most of Venezuela's indigenous peoples, and much of the biodiversity remains protected and inaccessible. Amazonas contains five national parks and one biosphere reserve, totalling 10.7 million hectares. While these protected areas were created in part to discourage illegal mining, the state continues to be affected by the activities of small-scale miners,

due to a lack of vigilance and monitoring.

In 1978, the Venezuelan government decreed that commercial logging would be prohibited in Amazonas pending the development of zoning and management plans for the area. Decree 2552 cites that the territory is critical for conserving the network of watersheds that feed the Orinoco River and that unplanned and mismanaged forest extraction would cause undue ecological damage. Similarly, in 1989, Decree 269 was passed, banning any mining activity in Amazonas state. Recognizing the ecological fragility of the Amazonian

ecosystems, the decree states that "the anarchy in mining activity which takes place in the Federal Territory of Amazonas [now Amazonas state], constitutes the primary cause of environmental degradation in this region."

State officials in Amazonas recently pressured the national government to lift both bans on logging and mining. A national and international outcry over the possibility of such a measure induced both the Venezuelan Congress and the European Parliament to adopt emergency resolutions urging the Venezuelan government not to lift the bans on mining and logging in

Amazonas. A three-year \$12 million research, planning, and equipment program for the biosphere reserve is currently being financed by the European Community. In the meanwhile, the Venezuelan government has stated it will not lift either the logging or mining bans, although Amazonas state officials appear to favor such a measure.

Sources: GOV "Decreto No. 269" (Gaceta Oficial No. 4,106 Extraordinario: Caracas, 6/9/89); GOV "Decreto No. 2552" (Gaceta Oficial No. 31,408: Caracas, 6/19/78); Oficina del Vicariato Apostolico de Puerto Ayacucho, "Informe Anual" (Puerto Ayacucho, 1997)

1.1 COMMITMENTS TO MULTILATERAL AND BILATERAL FUNDERS

When the price of oil crashed in the mid 1980s, the government began to seek mechanisms for diversifying the economy. Dubbed the "paquete," these measures included wage controls, price increases, and some limited social programs, leading to a loan agreement between the government and the International Monetary Fund (IMF). Oil prices increased in the early 1990s (see Figure 3), but fell again by the mid 1990s. In April 1996, the government of Venezuela signed a new structural adjustment

agreement with the IMF, which includes encouraging foreign investment and privatizing some of the country's publicly held assets, such as the telephone, steel, and aluminum companies. The new agreement resulted in a \$1.4 billion IMF loan with an additional pledge of \$2-3 billion from other multilateral institutions.

By themselves, these policies are not necessarily damaging to the integrity of forest resources and, in fact, may help decrease stress on natural resources by modernizing inefficient industries. However, recent studies suggest that without an accompanying environmental policy, structural adjustment measures can sometimes lead to a weakened

capacity to monitor and regulate environmental impacts, while doing little to alleviate poverty (see Box 2). A study on the effects of structural adjustment on the environment in the Philippines showed that these policies intensified natural resource use by exacerbating already high levels of poverty.¹¹

While the IMF has provided the largest loans to Venezuela, other multilateral donors have also been involved in projects there. In April 1996, the Inter-American Development Bank pledged a \$1 billion loan to Venezuela based on its stand-by agreement with the IMF. The World Bank has issued several loans to Venezuela, including a five-year \$55 million loan to the Venezuelan Park Service, and a

\$28 million loan to the Ministry of Environment to internally restructure and improve capacity. Specifically, this latter loan would, among other things, re-distribute ministry staff in regional offices, decentralize environmental management, increase private sector participation, and reinforce the national environmental monitoring network.

Funding to protect Venezuela's biodiversity has also come from other multilateral and bilateral sources. The European Union provides \$12 million for the Orinoco-Casiquiare Biosphere Reserve in Amazonas state through

2

THE EFFECTS OF STRUCTURAL ADJUSTMENT ON VENEZUELA'S FORESTS

The effects of structural adjustment policies on a country's economy and natural resources are difficult to determine, especially as this may require distinguishing them from other longer-term economic trends. Nevertheless, certain trends indicate that structural adjustment policies may have accelerated deforestation. The elimination of foreign investment controls under structural adjustment suddenly made Venezuela's investment climate much more attractive from the perspective of multinational companies, especially

those most interested in the country's highly valuable natural resources. While perhaps not an intended effect of structural adjustment, encouragement of foreign investment coincided with the following:

■ DECREASED ENVIRONMENTAL MONITORING AND OVERSIGHT.

Less priority was given to environmental monitoring and oversight. For example, between 1989 and 1993, investment in the environment declined by 35 percent and the number of employees in the Ministry of Environment declined by 11 percent. Also, the overall bud-

get of the Park Service fell by 48 percent between 1988 and 1994, while the total area under protected status increased by 58 percent. The ratio of Park Service employees to area protected decreased by 18 percent in the same period.

■ INCREASED POVERTY, MIGRATION, AND ENCROACHMENT ON PROTECTED AREAS. While structural adjustment did provide some social and economic relief, for the majority of Venezuelans these programs were not enough. High unemployment rates and acute poverty intensified already existing land-use pressures,

resulting in amplified encroachment in protected areas.

Sources: Anil Markandya et al., "Case Study for Venezuela" in David Reed, Structural Adjustment, the Environment, and Sustainable Development (Earthscan: London, 1996); C. Sharpe, "The Effects of Structural Adjustment on the Venezuelan National Parks System" Report to CENDES (Universidad Central de Venezuela, Caracas, 1994); C. Sharpe et al., "The Effects of Structural Adjustment on the Venezuelan Environment as Illustrated by Trends in Basic Environmental Indicators" (CENDES/UCV: Caracas, 1994).

the regional development agency, the Autonomous Environmental Development Service of Amazonas State (SADA-Amazonas). SADA-Amazonas is currently developing a management plan for the biosphere reserve. However, the biosphere reserve remains little more than a paper decree, with little coordination or implementation on the ground. The Global Environment Facility has also provided \$270,000 for Venezuela to develop its first national report to the Conference of the Parties on the Convention on Biological Diversity (CBD) and to assist in the development of the country's National Biodiversity Strategy and Action Plan, as required by the CBD.

1.2 POLICY BACKGROUND

Venezuela has a long history of environmental legislation. Laws relating to environmental issues began to appear as early as 1910, and the Ministry of Environment and Renewable Natural Resources (MARNR) was established in 1977, the first such ministry in all of Latin America. As a result, environmental legislation is extensive, consisting of more than 80 laws and 400 decrees and regulations (*see the selection in Table 1*). Laws are passed by congress and signed by the president, regulations are issued by ministries as specifications to laws, and the president has the power to enact decrees to further the governing administration's policies. Decrees

and resolutions are generally utilized as political tools because they can be passed quickly by the executive branch; for example, between 1973 and 1989, 68 percent of national parks were established by decree during election periods.¹² Venezuelan laws are applied in a hierarchical fashion; organic laws are superior to ordinary laws, which have more weight than presidential decrees, or ministerial resolutions. Within legislative categories, those laws with the most recent date supersede older laws when they overlap or conflict. In recognition of the potential environmental impacts of human-related activities, the key environmental laws have been assigned an organic stature.

Protection and conservation of the nation's valuable natural heritage pervades many of the country's existing laws. Over 80 percent of the forests south of the Orinoco River are protected in some form as Areas Under Special Management (ABRAE), according to the Organic Land Use Zoning Law. These areas make up the country's protected area system and comprise 10 major categories. An additional 15 management categories are also considered as ABRAE, many of which are not managed for conservation purposes. In all, the ABRAE make up 46 percent of the national territory, and range in degree of protection from strictly protected to production and limited use zones to minimal protection. Those that are strictly protected are shown in Table 2.

FIGURE 3

Official Price of Venezuelan Crude Oil, 1970-1975

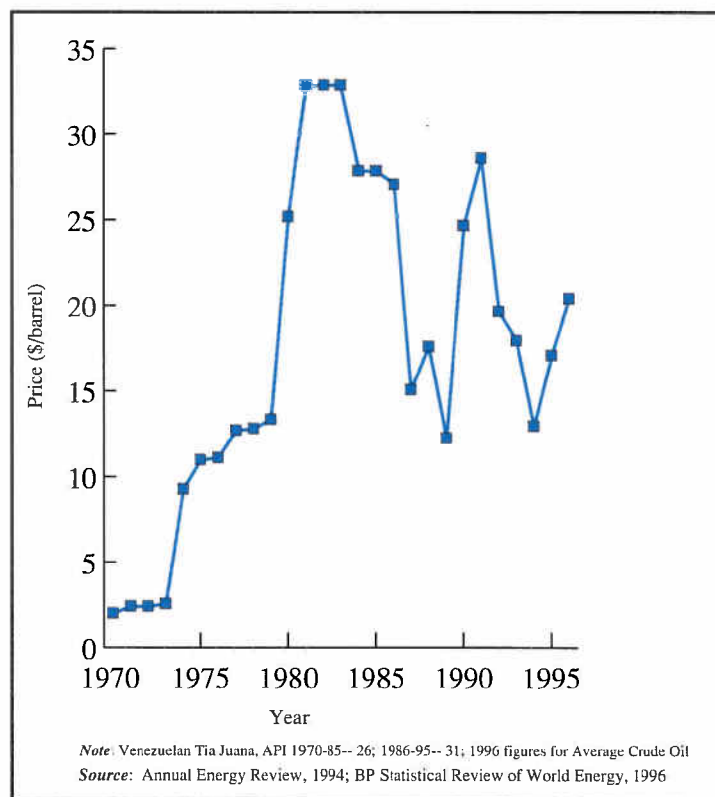


TABLE 1

Primary Legislation Relevant for Protection of Venezuela's Forests

LEGAL INSTRUMENT	YEAR	RELEVANCE FOR FORESTS
Organic Land Use Zoning Law	1983	<ul style="list-style-type: none"> Establishes processes for national land-use zoning Establishes the requirement to carry out land-use zoning Establishes administrative procedures for planning in protected areas
Organic Law of the Environment	1976	<ul style="list-style-type: none"> Establishes guiding principles for environmental conservation, including the creation and protection of forest reserves and use of natural resources
Organic Law of Central Administration	1976	<ul style="list-style-type: none"> Creates the Ministry of Environment and defines its competencies
Special Law Ratifying the Convention on Biological Diversity	1994	<ul style="list-style-type: none"> Ratifies the Convention on Biological Diversity, which among other things, calls on all countries to take measures to protect biological diversity
Penal Environmental Law	1992	<ul style="list-style-type: none"> Establishes penalties for acts that degrade the environment, based on the minimum wage, and jail sentences Punishes public sector employees who grant permission for activities that damage the environment without an environmental impact assessment
Law Protecting Wildlife	1970	<ul style="list-style-type: none"> Establishes wildlife reserves, wildlife refuges, and wildlife sanctuaries Establishes norms for hunting, with the acquisition of the necessary permits
Law of Forests, Soils, and Water	1965	<ul style="list-style-type: none"> Regulates conservation and use of natural resources found in forests Prohibits extractive activities in national parks Establishes protected zones for major watersheds Prohibits deforestation or annexation of forest reserves without prior approval from congress
Decree 1850	1996	<ul style="list-style-type: none"> Zones the Imataca Forest Reserve. Allows mining in 40% of the reserve.
Decree 1257	1996	<ul style="list-style-type: none"> Establishes regulations for developing environmental impact assessments States that timber concessionaires who develop management plans are exempt from producing an environmental impact assessment
Decree 2219	1992	<ul style="list-style-type: none"> Establishes requirements for mining concessionaires to obtain permits for occupying land and for extracting minerals States that mining companies are not allowed to begin activities until they have a permit to occupy the land they wish to explore
Decree 2214	1992	<ul style="list-style-type: none"> Establishes norms for regulating activities in forest reserves, woodland lots, and other forested protected areas Defines land-use zones to be considered in forest reserves
Decree 1742	1991	<ul style="list-style-type: none"> Recognizes the importance of the upper Caroni watershed for the provision of hydroelectric power Prohibits the use of mercury, except in specialized labs and facilities Assigns the regional Corporación Venezolana de Guayana (CVG) the responsibility of regulating and controlling the use of mercury, with coordination and assistance from the Ministries of Environment and Mines
Decree 1738	1991	<ul style="list-style-type: none"> Prohibits any mining that can destroy the environment Environmental impact studies will define which mining activities have the potential for irreparable damage to the environment Assigns monitoring of mining activities to the Ministry of Environment, with support from the Ministry of Mines and the National Guard
Decree 1740	1991	<ul style="list-style-type: none"> Prohibits the act of burning mercury in open air or using techniques that allow mercury to escape into the environment Requires any person using mercury to get necessary permits from the Ministry of Environment
Decree 636	1990	<ul style="list-style-type: none"> Prohibits any activity in forest reserves or woodland lots that are contrary to the objectives for which the reserve or forest lot was created
Decree 276	1989	<ul style="list-style-type: none"> Defines administration and management of national parks and natural monuments Prohibits certain activities, such as mining, in national parks or natural monuments
Decree 269	1989	<ul style="list-style-type: none"> Prohibits any mining in Amazonas state
Decree 2552	1978	<ul style="list-style-type: none"> Prohibits any industrial logging in Amazonas state
Resolution 332	1984	<ul style="list-style-type: none"> Establishes requirements to obtain a permit for surficial mining Allows the Ministry of Environment to set an amount for a bond which is returned to the concessionaire once reclamation is complete

Note: Instruments are organized by legal hierarchy

Source: Adapted from MARNR, Balance Ambiental de Venezuela, 1994-95 (GOV: Caracas, 1995, p. 82-83).

TABLE 2

Activities Allowed in Venezuela's Strictly Protected Forest Areas

VENEZUELAN PROTECTED AREA CATEGORY	PERCENT OF ABRAE	ACTIVITIES ALLOWED ACCORDING TO VENEZUELAN LAW	CORRESPONDING IUCN CATEGORY
Wildlife refuge	.12	Research	Category IV
National park	19.8	Tourism, limited subsistence activities	Category II
Natural monument	10.4	Tourism, limited subsistence activities	Category III
World Heritage Site	4.6	Canaima National Park is the only designated World Heritage Site. Activities allowed are the same as those indicated above for national parks	Category II

Note: ABRAE = Areas Under Special Management

Source: MARNR Balance Ambiental de Venezuela, 1994-95 (Ministry of Environment: Caracas, 1995); GOV, Ley Forestal de Suelos y de Aguas (Gaceta Oficial No. 1094: Caracas, 1/26/66); J.A. McNeely et al., Conserving the World's Biological Diversity (WRI, IUCN, Conservation International, World Bank: Washington, DC, 1990).

In addition to these protected areas, much of Venezuela's existing environmental legislation recognizes the importance of maintaining healthy ecosystems for the protection of the nation's valuable water resources.¹³ Indeed, Canaima National Park, located in southern Bolivar state was expanded in 1975 primarily to protect part of the Caroni River watershed.¹⁴ Progressive legislation favoring conservation of valuable natural resources was passed in many cases long before other governments in the region instituted similar policies. For example, in 1978 the government passed Decree 2552 and, in 1992, Decree 269, which prohibit mining and logging in the forests of Amazonas state (*see Box 1*).

Venezuela's laws also protect forest and water resources from contamination due to mining. The 1944 Mining Law specifies that concessionaires are allowed access to water resources, but are to ensure that effluent is not discharged into rivers, that excess sedimentation is not a product of mining activities, or that neighboring communities are not deprived of potable water. In 1991 the government decreed that all mining that degraded the environment would be prohibited in Bolivar state.¹⁵ That same year the use of mercury for amalgamating gold was prohibited by presidential decrees 1448, 1740, and 1742. Decree 1742 specifically

recognized that, "the upper Caroni watershed represents a strategic area for Venezuela, as it is there that the majority of electricity consumed by the country is produced."¹⁶ However, in March 1995, the Ministry of Mines issued Resolution 036, which prohibited the use of mercury for amalgamation on dredges or near rivers, but allowed its use in mill facilities when no other technique was available.¹⁷ Despite these achievements, environmental

laws are dispersed, and overarching laws often lack the necessary implementing regulations for enforcement. For example, implementing norms for the Penal Environmental Law are not complete and do not specify requirements for environmental reclamation of such activities as mining.

II. FUTURE RESOURCE USE AND LARGE-SCALE DEVELOPMENT PLANS

The current administration has outlined its development plans in a series of policy documents, which favor an increase in mineral and oil production, as well as integrating the Guayana region into the rest of the national economy. These policies reflect a development model which has been contemplated in other Amazon Basin countries and has led to widespread deforestation and social conflict in parts of these countries.

2.1 INCREASING EXPORTS

Most of the administration's development policies are outlined in the Ninth National Development Plan (*see Box 3*). Among these policies, the government has emphasized diversification of the country's export base as a priority, as this could help diminish Venezuela's reliance on oil as a primary income source. To this end, the government has identified forestry and mining as activities which, if substantially increased, could contribute significantly to the nation's development.

The area under timber concessions has doubled since 1990; only 1.7 million hectares were under concession in 1990,¹⁸ while over 3.5 million hectares are currently managed in logging concessions.¹⁹ While the total area under concession represents only 4 percent of the country, the rate at which logging concessions are being granted is significant, and officials have indicated that this increase will continue.²⁰ Gold production has also increased substantially — from 8.7 tons in 1993 to nearly 20 tons in 1997—more than doubling in four years.²¹

2.2 THE PRODESSUR PROPOSAL: SUSTAINABLE DEVELOPMENT OR UNCONTROLLED COLONIZATION?

The Ninth National Development Plan defers policies for the Guayana region to the Sustainable Development Project for the South (PRODESSUR). Written in 1994 by a committee of policy-makers and military personnel, PRODESSUR has its roots in colonization and development plans of the 1970s.

The 1970s administration unveiled a colonization and development plan for the Guayana Region nationally known as "Conquest of the South," (CODESUR) which sought to stimulate economic development and integration of the Guayana region with the rest of the country. Based on the need to secure its borders with Brazil and Colombia, the plan focussed on inducing migration to the nation's remote frontier regions by establishing frontier settlements and promoting agricultural development.

The CODESUR plan was never implemented, in part because it was overly ambitious. However, in 1994, PRODESSUR became the new development policy for the Guayana region. While the document attempts to incorporate sustainable development principles, it is, nonetheless, a virtual reincarnation of the government's earlier colonization plan.²² Some of the major components of PRODESSUR include:

- Creation of a network of settlements in the "unoccupied" interior of Bolivar and Amazonas states and, especially, along the

border with Brazil, Colombia, and Guyana. (In fact, these areas are populated by indigenous peoples.)

- A 15 percent population increase through encouraging migration to the rural portions of the states located south of the Orinoco River.

- Accelerated development of natural resources and economic activities, such as mining, oil exploration, tourism, agriculture, and forestry.

- Construction of infrastructure, such as roads, airstrips, and waterways, to establish a national presence on the border and to ensure the movement of agricultural products and natural resources to outside markets.

Such development plans are not new in Amazonian countries. Brazil has also developed similar colonization and economic development proposals for its Amazonian territory. While the desire to stimulate development is well intentioned, colonization schemes in the Amazon have largely failed to provide the expected social and economic benefits and environmental costs have been high (*see Box 4*).

3 SOME KEY ELEMENTS OF THE NINTH NATIONAL DEVELOPMENT PLAN

The Ninth National Development Plan outlines the current administration's policies to take Venezuela into the next century. Some of the key economic elements of the plan include:

- **INCREASING AGRICULTURAL PRODUCTION.** Recognizing Venezuela's dependency on

agricultural imports, the current administration proposes making Venezuela a net exporter in agricultural products by the end of the decade.

- **INCREASING ELECTRICITY GENERATION.** The plan proposes maximizing the electric potential of the Guri Dam by selling

electricity to northern Brazil. Indeed, such an agreement has already been signed by both governments and construction on a 230/440 kilovolt power line is already underway.

- **OPENING PETROLEUM AND GOLD EXPLORATION TO OUTSIDE INVESTORS.** Investment will be opened to

foreign oil companies. A similar strategy is also proposed for gold mining.

Source: CORDIPLAN, Un proyecto de país: Venezuela en consenso, documentos del IX Plan de la Nación. (GOV: Caracas, 1994), p. 121.

2.3 THE PROPOSED NEW MINING LAW

All mining activity is subject to the regulations identified in the 1944 Mining Law, which is now considered to be out of date. When this law was passed, the Venezuelan government discouraged foreign investment by limiting it, and by imposing foreign exchange controls. In addition, the 1944 law preceded much of Venezuela's environmental legislation, which was not developed until the 1970s and 1980s. As a result, a new mining bill has been circulating in Congress. The latest publicly available draft of the bill was promoted by the Senate Mining Commission.

From an environmental perspective, one of the key dangers of the Senate version is that it is considered organic. Assigning an organic nature to the new mining bill in effect places it above all other legislation, including environmental legislation that affects mining activity, because the new mining law would be more recent than the organic environmental laws currently on the books. This version also appears to ignore the national zoning plan contemplated in the Organic Land Use Zoning Law, by basing all land-use planning on the geographic distribution of minerals. In this respect, the Senate mining bill proposed preferential treatment for mining activity over all other uses, including protection, agriculture, forestry, security, and urban development, implying that all protected areas could be opened for mining activity.

The Senate version was criticized by environmentalists and the Ministry of Environment, and a new draft is now being introduced by the Senate Mining Commission. It appears that this version would not be considered organic, although such a possibility still exists.²³

In all likelihood, the new law would establish a superintendency of mines, whose primary responsibilities would be to collect taxes on mining concessions and monitor mining activity. An environmental management unit would be part of the new superintendency to facilitate the granting of permits, so mining concessionaires would not have to wait for paperwork approval from the Ministry of Environment. The superintendency would reside within the Ministry of Mines,

although both the ministries of Mines and Environment would coordinate monitoring and environmental regulation. While such an arrangement may make sense from a technical mining standpoint, it could lead to decreased environmental oversight over mining activities, especially since these ministries have little record of past collaboration. Such a measure would directly contradict the intent of the Organic Law of Central Administration, which establishes that the responsibility for environmental regulation, administration, and monitoring belongs to the Ministry of Environment.

4 COLONIZATION OF THE BRAZILIAN AMAZON BASIN: "CALHA NORTE"

During the 1960s and 1970s Brazil was governed by a series of military regimes, most of which emphasized the Amazon Basin as a region to be colonized and integrated into the rest of the nation. In the mid-1980s Brazil elected a civilian president, but militaristic proposals continued to hold influence. In 1985, Brazil's National Security Council developed a proposal for a frontier development project. Termed "Calha Norte," the project was aimed at

securing Brazilian borders from the narcotics trade and guerilla movement in neighboring countries, especially along northern Roraima state, where the Yanomami live. The project proposed setting up military settlements along the border, expanding roads, and promoting economic activities, especially large-scale mining. The project specifically identified the Yanomami territory as a potential problem for Brazil's sovereignty, especially because the

proposed territory would span both Venezuelan and Brazilian sides of the border.

Such development and colonization policies have resulted in high environmental and social costs. Brazil's Amazon region has experienced high deforestation rates, and the problems appear to be worsening. In addition, the area's indigenous people have shouldered an undue portion of the burden. Spurred by increased access to the region and a lack of regula-

tion, gold miners and loggers have habitually invaded indigenous territories, exposing communities to diseases for which they have no immunity and killing villagers who opposed their presence.

Sources: M. Schmink and C.H. Wood, *Contested Frontiers in Amazonia* (New York: Columbia University Press, 1992); S. Schwartzman, "Fires in the Amazon—An Analysis of NOAA-12 Satellite Data, 1996-1997," Unpublished paper, 1997.

III. ON THE GROUND: VENEZUELA'S FOREST POLICY IN THE GUAYANA REGION

Southern Venezuela represents one of the five major tropical wilderness hotspots in the world.²⁴ Much of the area is covered by dense lowland forest, which has not yet been completely inventoried,²⁵ and contains highland table-top mountains, known as tepuyes. These almost unique formations are home to many endemic species. Bolivar State is also the site of Angel Falls—at 3,212 feet, the highest free-falling waterfall in the world. The Orinoco River and its tributaries are critical for local and national populations, not only because they contain

over 1,000 fish species,²⁶ many of which supply food for local populations, but also because the Guri Dam, which provides 72 percent of the nation's hydroelectric power, depends on this water system. In addition, 80 percent of Bolivar state's drinking water comes from the Caroni River.²⁷

According to the United Nations Food and Agriculture Organization (FAO), Venezuela's annual deforestation rate was 1.1 percent between 1990 and 1995, almost twice the average for South America.²⁸ While existing data show that much of the deforestation has occurred in the

northern part of the country, satellite data for the forests south of the Orinoco River have not been studied, and little is known about the deforestation rate in this region.

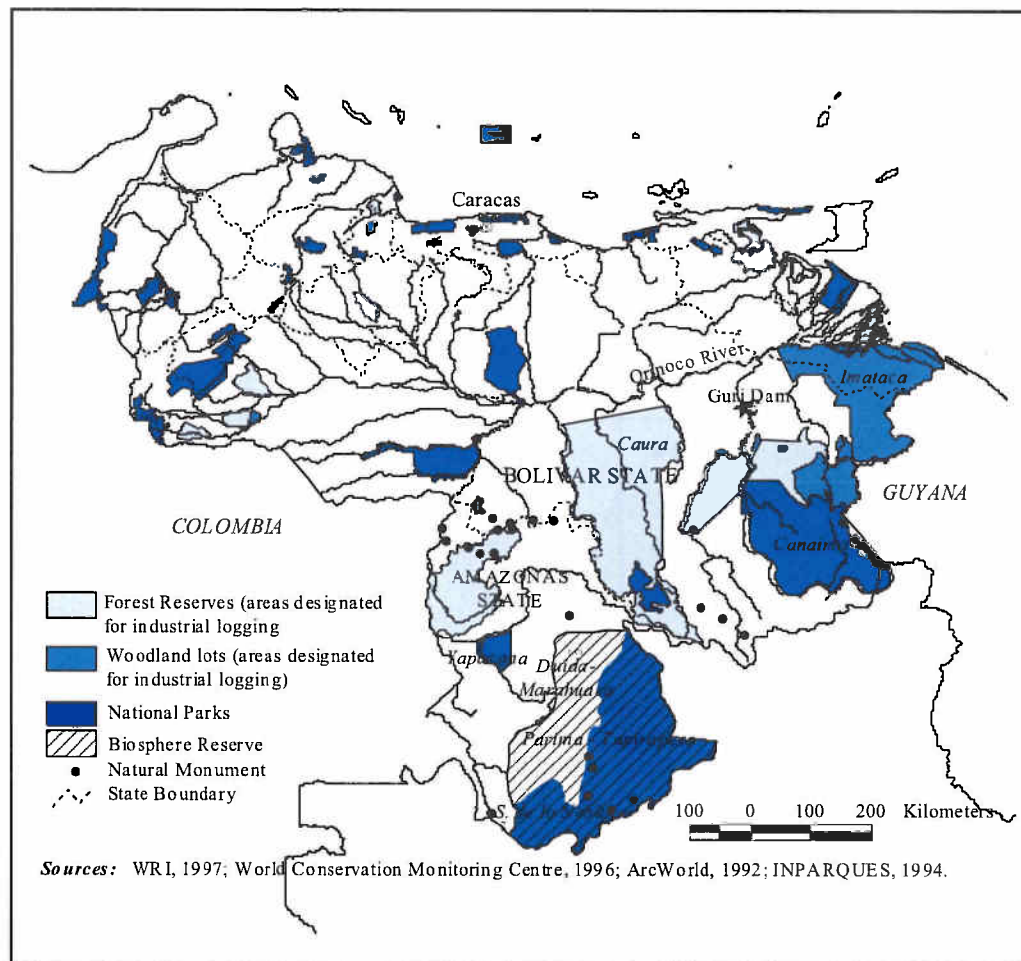
The forests of the Guayana region are distinctly different from those found in the western Llanos region.²⁹ Made up of semi-deciduous, deciduous, and evergreen forests, the Guayana region is characterized by megadiverse ecosystems, poor soils, and a tropical climate. There, the removal of the forest canopy interrupts the nutrient cycle, and recuperation is at best a lengthy

and complex process.³⁰ The western Llanos region, on the other hand, is made up of semi-deciduous, homogeneous forests with rich soils and a high concentration of valuable commercial timber species. Unlike forests in the western Llanos, those in the Guayana region present far fewer commercial timber species per hectare, allowing for average harvests of only 2-10 trees per hectare, or less than half the density of the western Llanos forests.

In addition, much more is known about these forests than those of the Guayana Region. In a partial survey of scientific investigations carried out in national forest reserves up until 1992, those located in the Llanos region, which make up 4 percent of the forest reserves, were the subject of 60 percent of the studies, while forests of the Guayana region, which make up 90 percent of total forest reserves, were the subject of only 30 percent of the studies (half of these were carried out in the Imataca Forest Reserve).³¹ Most of these studies focussed primarily on commercial tree species and few presented ecological data or evaluations of biodiversity.³² Furthermore, the little existing information regarding this region has not been organized in any systematic way, resulting in a mosaic of generally unconnected data with noticeable gaps in geography and subject matter.

FIGURE 4

Venezuela: Strictly Protected Areas and Areas Designated for Industrial Logging



3.1 COMMERCIAL TIMBER EXTRACTION

SECTION HIGHLIGHTS:

- In the Guayana region, forest management practices contribute to deforestation and a loss in biodiversity.
- Silvicultural practices commonly used by timber concessionaires in other parts of Venezuela as well as throughout the tropics do not appear to stimulate adequate growth of commercial species.
- Motivated by political interests, small-scale farmers are converting forests for agricultural use.
- About 2 million hectares of forest reserves and woodland lots are currently affected by a combination of the above impacts.

Timber extraction is at a critical point in Venezuela (see section highlights). Logging occurs in forest reserves, woodland lots, and through the issue of annual permits. Forest reserves and woodland lots comprise approximately 13 percent of the national territory, and forest activity in these lands is for the purpose of supplying the forest industry with timber in a sustainable manner, so that a healthy forest is left standing (see Figure 4). Forest reserves are established by presidential decree and are considered to be large tracts of forest with important economic interest for timber extraction.³³ Woodland lots are similar to forest reserves, except they are generally established by the Ministry of Environment in response to illegal encroachment on otherwise unprotected public lands. Annual permits are given for private

landowners to exploit timber on their land. These permits do not require the application of forest management techniques, and there are few limits on the amount of wood extracted.³⁴

CHARACTERISTICS OF THE FOREST INDUSTRY

The forestry sector contributes only 1 percent of Venezuela's GDP.³⁵ This percentage does not include government subsidies, which have led to inefficient practices. For example, sawmills often operate at half their capacity with outdated equipment, and waste at the mill can amount to as much as 60 percent.³⁶ In comparison with other countries in the Guiana Shield, such inefficiencies are not unusual.³⁷

Commercial timber extraction occurs primarily in natural forests and focusses on approximately 25 tropical species; in the western Llanos these include mahogany (*Sweetenia macrophylla*) and saqui saqui (*Bombacopsis quinata*), while in the Guayana region these include mureillo (*Erismia uncinatum*) and puy (*Tabebuia* sp). Approximately 75 percent of timber extracted from natural forest concessions is taken to a local sawmill, where it is processed into sawnwood to provide a limited number of products for the local market, such as construction and roofing materials.³⁸ Very little timber extracted from natural forests is destined for export; in 1996, Venezuela exported only 1,000 cubic meters of roundwood, at an estimated value of \$359,000.³⁹

The forestry sector is dominated primarily by local family enterprises; local timber mills satisfy 93 percent of the national market for wood with only 7 percent coming from imports.⁴⁰ Production is increasing steadily; data from the Forest Service indicate that roundwood production quadrupled in 15 years, probably as a result of rising local demand. In addition, Figure 5 indicates that production from the issue of annual permits has generally surpassed production from timber concessions, although this trend has recently changed, as the government has begun to favor issuing timber concessions. International investment is practically nonexistent because of a log export ban and limits on foreign

FIGURE 5

Roundwood Production by Type of Permit, 1981-96

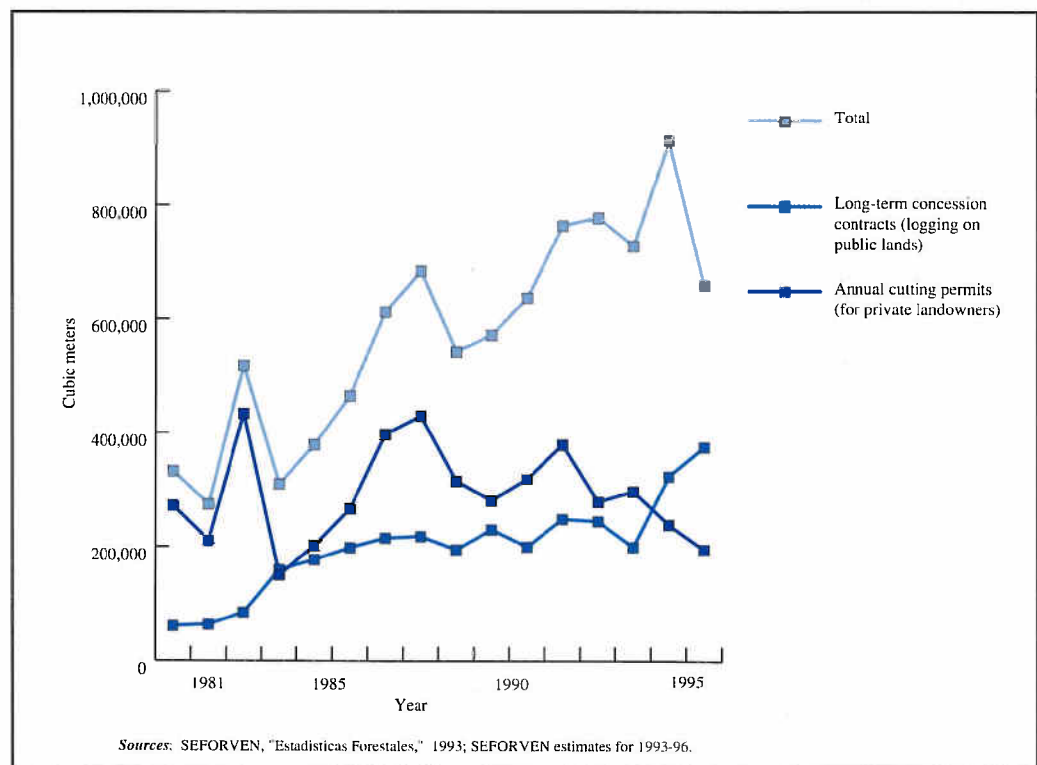


TABLE 3

Sustainable Management of Venezuela's Forests: Policies vs. Reality

FOREST POLICY FRAMEWORK ESTABLISHED BY THE VENEZUELAN FOREST SERVICE	RESULTS ON THE GROUND (As indicated in previous analyses of THE VENEZUELAN FOREST SERVICE)
■ Management based on the conservation of forest ecosystems and sustainable development	■ Management which emphasizes "sustained yield" timber extraction rather than sustainable management
■ Integration of forest management functions within the forest service and with other departments in the Ministry of Environment	■ Lack of forest policy coordination within the ministry as well as among regional ministry offices
■ Development and strengthening of scientific forest management research	<ul style="list-style-type: none"> ■ The research department has 5 staff in Caracas and 2 in Bolivar; between 1996 and 1997 only 1 research project was carried out in the Guayana region ■ By 1991, 30 percent of scientific studies were carried out in the Guayana region, which makes up 90 percent of all public lands dedicated to forest management ■ Evaluation of environmental and social impacts from logging is not considered a research priority ■ Lack of a multi-disciplinary research staff—over 95 percent of all professional staff are foresters
■ An adequate program of vigilance and control in Forest Reserves	<ul style="list-style-type: none"> ■ Only 15 technical forestry personnel to administer and monitor 12 million hectares of production forests in the Guayana region ■ By 1994, 1,262 illegal occupants affected 39 percent of the Ticoporo Forest Reserve; 44 percent of the Caparo Forest Reserve had been occupied by illegal squatters
■ Diminish the pressure to develop forests for uses incompatible with forestry	<ul style="list-style-type: none"> ■ Local residents receive few benefits from forestry ■ Lack of education at the public level in regard to the value of forests
■ Promote human resources development and staff training	<ul style="list-style-type: none"> ■ Forestry professionals are paid between \$400-\$900 per month ■ Many professionals leave the Forest Service for higher-paying jobs
■ Mining is incompatible with forestry and cannot be reconciled with the objectives of forest management	■ Promotion of mining in over 40 percent of the Imataca Forest Reserve, according to Decree 1850
■ Elevate the role of the forest sector in the national and local economy	<ul style="list-style-type: none"> ■ Forest sector represents only 1 percent of GDP ■ Almost all forestry workers come from one town in Bolivar State and employment is seasonal ■ Lack of local forestry extension programs
■ Forest sector participation in national and international fora relating to conservation and use of forest resources	<ul style="list-style-type: none"> ■ No presence from Venezuela at the World Forestry Congress in 1997 ■ Venezuela lost its membership in ITTO and failed to pay its dues to IUCN in 1997

Sources: Column one is based on the policy framework established according to Decree 275 "Decreto para la Creación del Servicio Forestal Venezolano" (Caracas:Gaceta Oficial Extraordinaria No. 4,106, 1989); MARNR, "Marco Institucional y Funciones del Servicio Forestal Venezolano" (Caracas, 1990); MARNR "Gerencia del Servicio Forestal Venezolano en el Manejo y Desarrollo de los Recursos Forestales" Seminario Sobre el Manejo Forestal en Venezuela, (Caracas, 1991). Column two is based on J. Centeno, 1995; Food and Agriculture Organization and World Bank, Field Report No. 19, 1994; L. Hernandez et al., 1994; L. Hernandez et al., 1997; C.J. Sharpe et al., 1994; A. Luy, 1992.

investment. However, with the removal of exchange controls in 1996, some local companies have begun to seek investment from the international forestry community, and this could well increase in the future if experience in neighboring Guyana and Suriname is any indication.⁴¹

FORESTRY POLICY AND INSTITUTIONS

The Venezuelan Forest Service (SEFORVEN) was created in 1989 as a semi-autonomous entity within the Ministry of Environment responsible for developing zoning and management plans for public forest lands, enforcing forestry-related regulations on timber concessionaires, establishing and

collecting royalties and area fees, and defining research priorities for the sustainable use of forest resources. SEFORVEN's budget depends in part on its ability to raise funds from fees and fines related to forest activities, but the agency also receives a stipend from the ministry and the director is appointed by the Minister of Environment.

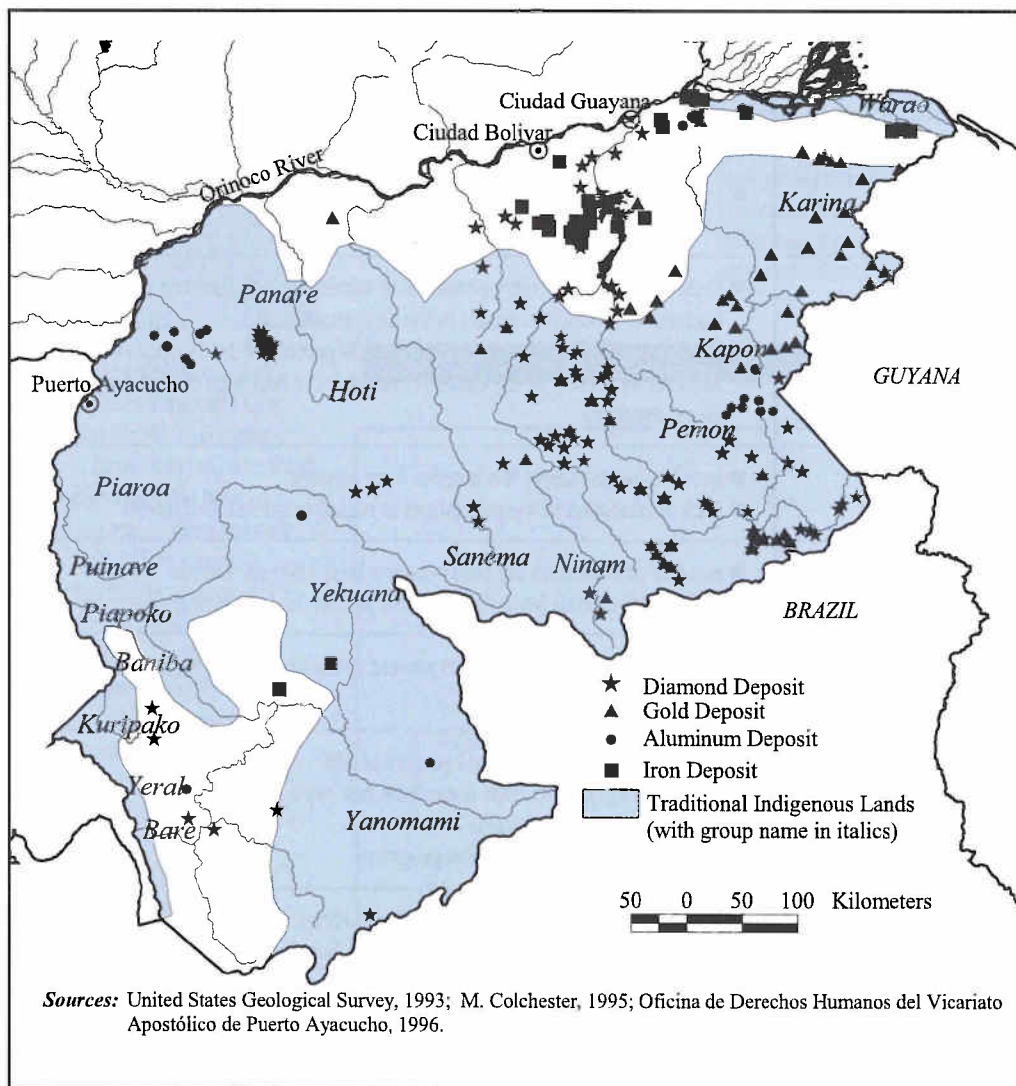


Venezuela has a long history of managing its forests for timber production.

Theoretically, SEFORVEN's policies are based on the philosophy of sustainable development in the forest sector, focussing especially on concepts of natural forest conservation. However, from the information given in Table 3, it appears that SEFORVEN has identified a number of theoretically sound forest management objectives, but these goals are somewhat vague and in reality the agency appears to have difficulty implementing and adapting its policies to experiences on the ground.⁴² Moreover, SEFORVEN has little capacity and resources to implement its own policies, because of the limited number of personnel operating in the field and a lack of inter-disciplinary staff capable of evaluating and monitoring forest biodiversity. For example, SEFORVEN has only 15 technical forestry personnel responsible for administrative activities in 12 million hectares of Bolivar state. Of these technical staff persons, only three patrol nearly 3 million hectares of timber concessions with a single four-wheel-drive vehicle, requiring inspectors to rely on the good will of concessionaires to escort them in and out of concessions. In addition, the fact that most ministry officials are appointed with each new administration contributes to the institution's instability, ensuring that political calculations are often more important than technical, geographic, or institutionally established criteria.⁴³

FIGURE 6

Overlap Between Mineral Deposits and Traditional Indigenous Territories



TERMS OF CONCESSION AGREEMENTS

Venezuela has a long history of managing its forests for timber production. The nation's first forest reserve was created in 1950 in the western Llanos region, in response to the growing encroachment of the agricultural frontier on forest resources. In 1970, the government began granting timber concessions and requiring the development of long-term concession management plans. In the Guayana region, forest concessions average between 80,000 and 160,000 hectares and are granted by the Forest Service for 20- to 40-year cutting cycles. The process of

obtaining a forest concession begins with an application, in which the company selected must present a proposed management plan. Concessionaires are chosen on the basis of their technical and financial capacity to operate a timber concession and any additional benefits they may offer (such as establishing research centers), rather than the amount they may offer the government in royalties and area fees.

The proposed management plan allows the concessionaire to extract timber from "research parcels" within three years, after which the concessionaire must present a formal management plan to obtain a signed contract.⁴⁴ During this period, the government does not collect any taxes or royalties on the timber extracted. The formal management plan includes

components for forest inventories (usually only for commercial timber species), management methods, research, extraction, economic and social analysis, road building, and road maintenance.⁴⁵ Once a concession is granted, yearly harvest plans must be submitted to the Forest Service before any cutting can occur for that season, and the Forest Service is responsible for monitoring and inspecting timber extraction on forest concessions. All concessionaires must put aside some portion of their concession for conservation purposes, although the designation of this area is at the concessionaire's discretion.⁴⁶ According to the Forest Service's policy, management plans are to be revised every five years to incorporate any changes that may have occurred in that period.

No environmental impact assessment is required for logging on public lands, despite the fact that under Venezuelan law all individuals and corporations must provide an environmental impact assessment if they will be engaging in commercial activities that could damage the environment. In 1996, the Ministry of Environment passed Resolution 506A, establishing that timber extraction does not require an environmental impact assessment, since concession management plans were deemed to fill this role.⁴⁷ Nonetheless, because the concession management plans do not require any assessment or mitigation of environmental impacts, forestry activities face a less stringent requirement to minimize environmental damage than other industries.

5

GUIDELINES FOR REDUCING THE IMPACTS OF LOGGING

If forest resources are to be available for future generations, harvesting techniques must incorporate measures to reduce the impact of extracting timber. Recommended guidelines for harvesting timber and managing forests include the following:

- **CAREFULLY PLANNED ROAD BUILDING:** Roads should be built in a manner that reduces the potential for soil erosion, loss of wildlife, or disruption to neighboring settlements. Roads should be no wider than necessary to safely and efficiently haul timber from the concession, and the total length of roads on a concession should be designed to minimize habitat fragmentation.
- **CONTROLLED CUTTING PRACTICES TO MINIMIZE DAMAGE TO**

SURROUNDING FOREST: Cutting practices should minimize damage to surrounding trees and vegetation. Trees should be cut so that they fall in the direction that minimizes damage to the surrounding forest canopy.

■ **MINIMAL IMPACT IN HAULING TIMBER:** Skidder trails should be planned to minimize their density and impacts on the surrounding forest. A system of designated skidder trails can help reduce impact if the vehicles are required to stay on trails. Trails should be a part of the harvesting plan and should be clearly indicated on concession maps.

■ **RESPECT FOR INDIGENOUS PEOPLES' RIGHTS:** Indigenous peoples have the right to control forest management on land they

have traditionally occupied. Forest management activities should not threaten or diminish their rights to tenure or customary use of these lands.

■ **ENVIRONMENTAL IMPACTS SHOULD BE ASSESSED AND MINIMIZED:** Special attention should be given to protecting rare, threatened, or endangered species and to defining conservation zones on a scale appropriate to the uniqueness of the area in question. Ecological functions, such as natural cycles, forest regeneration, and ecosystem services should be maintained.

■ **AREAS UNDER LOGGING SHOULD BE MONITORED AND ASSESSED FOR THEIR IMPACT ON THE FOREST:** Monitoring should include the environmental and social effects

of harvesting and other operations, the changes in composition of the flora and fauna, and the regeneration of the forest. Results from monitoring should be made public and incorporated into the management plan.

■ **NATURAL FORESTS SHOULD BE MAINTAINED:** Primary forests and other well-developed secondary forests should be conserved and should not be replaced by plantations or converted to other uses.

Sources: D. P. Dykstra and R. Heinrich, *FAO Model Code of Harvesting Practice* (FAO: Rome, 1996); Forest Stewardship Council, "Principles and Criteria for Forest Management," Document 1.2 (Oaxaca, Mexico, March 1996).

FOREST MANAGEMENT PRACTICES

Forest management practices are based on the selective harvesting and re-planting of valuable species, theoretically guaranteeing commercial trees for future harvesting rotations. Techniques used in Venezuela were originally developed in European temperate forests and adapted for the tropical forests of the western Llanos region. The Venezuelan Forest Service has characterized such forest management as "experimental."⁴⁸

The Forest Service has established that only trees greater than 40 centimeters diameter at breast height (dbh) can be harvested. Once granted a concession, logging companies begin building roads, workers' encampments, and landing yards where harvested logs are gathered before being transferred to neighboring sawmills on logging trucks. Yearly quotas of timber are harvested by chain saw operators, who look for the fastest route to commercial timber stands. Tractors and skidders then enter through the forest and collect felled timber. All concessionaires must operate their own sawmills, which are usually located outside the concession. In 30 percent of the forest area impacted by logging, concessionaires apply intensive silvicultural techniques, such as enrichment strip planting, to promote the growth of commercial species. Such plantation corridors are established 30 or 50 meters apart. These practices

attempt to mimic nature and are not unusual for the region. In the remaining impacted area, companies plant and promote the growth of commercial tree species. Variations on these logging practices are also used in Guyana and Suriname.⁴⁹

THE ENVIRONMENTAL AND SOCIAL IMPACTS OF FORESTRY

Silvicultural techniques generally require relatively large capital investments and intensive management. One recent study of the Chimanes forest in Bolivia concludes that such methods are often not systematically applied because of the associated high costs and uncertain return on the loggers' investment. In addition, stimulating regeneration of valuable commercial species, such as mahogany requires large areas of forest to be cut down, significantly enlarging the affected area.⁵⁰

Similar trends are evident in Venezuela's forests. Because of the high costs involved, concessionaires operating in Venezuela do not systematically apply prescribed silvicultural treatments.⁵¹ Furthermore, this system of forest management has been found to be inflexible, especially in its incapacity to adapt to the different forest ecosystems of the Guayana region and to ensure natural regeneration of some valuable commercial species.⁵²

Scientific research documenting the impact of logging on the forests of the Guayana region indicates that extraction and enrichment strip planting practices have resulted in fragmentation of the remaining forest, as well as a decrease in biodiversity.⁵³ In fact, to establish enrichment strips, an average of 1,200 trees (>10 cm dbh) per hectare were felled to plant an additional 400 commercial saplings.⁵⁴ Thus, virtually all trees greater than 10 cm dbh were cut in this area.⁵⁵ Furthermore, the remaining stands of valuable species were also damaged and subject to fungal infection during the extraction of nearby trees, which eliminated the remaining adult parent trees in two or three years.⁵⁶ According to the results of two studies of fauna in the Imataca Forest Reserve,⁵⁷ the composition of bird and mammal communities was significantly modified by logging activities. Even though some wildlife species can take advantage of secondary habitats, an important number of taxa declined in abundance and others were eliminated from logged forests.

Although the Venezuelan forest service requires timber concessionaires to apply silvicultural techniques, it does not prescribe reduced-impact logging.

Studies conducted in the Ticoporo and Caparo Forest Reserves of the Llanos region show that selective cutting, felling, and hauling practices are not conducted in a careful and well-planned manner, which damages remaining stands.⁵⁸ Timber extraction methods in both the western Llanos and the Guayana regions do not incorporate such reduced-impact logging techniques as directional felling or planned skidder trails and road development. Indeed, workers on timber concessions often work without maps, finding instead the most direct way to haul timber from the forest.

The United Nations Food and Agriculture Organization has developed guidelines that address methods for reducing environmental impacts in forestry operations. The Forest Stewardship Council (FSC) has developed additional criteria that might also help Venezuelan policy-makers define national standards for logging. The FSC is an international body that provides a framework for organizations certifying sustainable logging operations (*see Box 5*).

AGRARIAN REFORM AND DEFORESTATION

In the western Llanos forest reserves, unexpected population pressure from agricultural invasions has drastically reduced the original forest cover.⁵⁹ Between 1980 and 1990, land devoted to agriculture increased by 7.5 million hectares, while 6 million hectares of forests were lost.⁶⁰ According to a study conducted by the Ministry of Environment, northern Venezuela and the western Llanos region registered the highest rates of deforestation between 1975 and 1988.⁶¹ These regions, and Bolívar state, account for over 80 percent of land allocated for agrarian reform.⁶²

The conversion of forest reserves and woodland lots for agricultural production is driven primarily by Venezuela's Agrarian Reform Law.⁶³ The conversion is particularly marked in areas where roads, such as those built for timber extraction, facilitate access for many small farmers. In fact, agrarian reform has acted primarily as a colonization scheme. Land reform titles cannot be bought or transferred, so that to acquire agricultural land settlers invade public land until they can gain provisional titles, by proving that they have "improved" the land by clearing it for agriculture. After a few years, the soil may lose its fertility and settlers move further along the agricultural frontier in search of new land. Although agrarian reform initially expropriated and redistributed some large landholdings, most of the land has been allocated from existing public land in remote areas. In addition, the law implies that the government must indemnify squatters, if they are not evicted within 15 days and they have already improved the land.



In the Guayana region, invasion by landless peasants presents a significant challenge in the north and northwest sections of the Imataca Forest Reserve.

In many cases, local politicians facilitate illegal settlements by landless small farmers, often in areas designated as protected, in hopes of securing re-election.⁶⁴ Private, large-scale farmers have also facilitated access for landless peasants by using their political clout to acquire permits for them to occupy land. The settlers then clear forest land, which is subsequently converted into pasture at a low cost, and then sold to large-scale farmers to establish cattle ranches.⁶⁵ In the Guayana region, invasion by landless peasants presents a significant challenge in the north and northwest sections of the Imataca Forest Reserve. The invasion, like that observed in the western Llanos region, is motivated by political interests. Local government officials in Delta Amacuro state recently issued a resolution declaring part of the Imataca Forest Reserve as open for agriculture.⁶⁶

A combination of illegal settlements and logging has degraded at least 2 million hectares of forest reserves and woodland lots in Venezuela.⁶⁷ Although this represents a small percentage of the country's national territory, its impact on lands designated for timber production is significant; of the areas where timber concessions were granted north of the Orinoco river, nearly all have been deforested or severely degraded.⁶⁸

3.2 GOLD AND DIAMOND MINING

SECTION HIGHLIGHTS:

- The government has been unable to control the activities of small-scale miners in the Guayana region.
- The Ministry of Mines has little active presence in the Guayana region, so it cannot effectively monitor and control the environmental or social impact of mining.
- Multinational mining companies do not always operate in developing countries by standards set in their home countries.

Gold and diamond mining currently pose a threat to the forests of the Guayana region (see section highlights). Exploration for gold by small-scale miners has occurred since the last century, but it appears that much of the wealth still remains underground.

According to the United States Geological Survey, there is a 90 percent likelihood of at least 20 undiscovered gold deposits in the Guayana region, and a 50 percent chance that 40 or more exist (see Figure 6).⁶⁹ Although these deposits are likely to average only slightly over 15,000 ounces of gold each, all of them are economically viable to develop. Gold located near the surface, or placer deposits, appear to occur so frequently that USGS researchers found it difficult to quantify them, labeling their size and numbers as "significant."⁷⁰

Currently, much of the gold mining occurs along a series of so-called greenstone belts that traverse the Guiana Shield and in Venezuela include the southern portion of the Imataca Forest Reserve, the El Callao district of the Puerto Ordaz- Sta. Elena highway, and the southernmost forest region at the border with Brazil. Diamond-bearing deposits have been identified throughout Bolívar state and much of the mining occurs near the Brazilian border (see Figure 6). Historically, the region surrounding El Callao has been a mining zone since the mid-1800s. Artisanal and small-scale mechanized mining also occur in the Imataca Forest Reserve, although most of these operations are currently illegal. The Canadian gold mining multinational, Placer Dome, recently obtained a 4,000 hectare gold mining concession located inside the Imataca Forest Reserve, which contains 11.8 million ounces of gold, one of the largest deposits of gold in Latin America,⁷¹ and is capable of producing over half of Venezuela's total gold for 1997. Another Canadian company, Crystallex claims a portion of the same concession.

FOREIGN GOLD AND DIAMOND MINING COMPANIES WITH HOLDINGS IN BOLIVAR STATE

United States

Gold Reserve Corporation

Canada

Anglo-Andean Exploration Inc.
Athlone Resources Ltd.
Bard Silver and Gold Ltd.
Bema Gold Corp.
Bolivar Goldfields
Cadre Resources Ltd.
Carmanah Resources Ltd.
Chesbar Resources Ltd.
Coleville Resources Ltd.
Consolidated Magna Ventures Ltd.
Crystallex International Corp.

Canada (cont'd)

DiamondWorks Ltd.
El Callao Mining Corp.
(37.5% owned by Bema Gold)
Naxos Resources Ltd.
First Dynasty Mines Ltd.
Golden Bear Minerals Ltd.
Goldie Enterprises Inc.
Goldtex Resources Ltd.
International CanAlaska Resources Ltd.
Kinross Gold Corporation
Latin American Gold Ltd.
Manson Creek Resources Ltd.
Monarch Resources, Ltd.

Canada (cont'd)

Mylan Ventures Ltd.
Norcan Resources, Ltd.
Ourominas Minerals, Corp.
Placer Dome
Queenstake Resources, Ltd.
Rare Earth Resources Ltd.
Raudin Exploration Inc.
Teck Corporation
Tombstone Explorations Co.
Vannessa Ventures, Ltd.
VenGold, Inc.
Vista Gold Corporation

United Kingdom

Greenwich Resources

Australia

Broken Hill Proprietary Minerals

Sources: Canadian Mines Handbook, 1997-98 (Ontario, Canada: Southam Mining Publications Group); Adapted from Coordinadora de las Organizaciones Indígenas de la Cuenca Amazonica (COICA), "Canadian Companies Active in Countries with Territory in the Amazon Basin," unpublished report, 1994.

CHARACTERISTICS OF THE MINING INDUSTRY

In the Guayana region gold occurs in alluvial and quartz vein deposits. Currently, gold and diamonds are extracted using rudimentary methods, although some mining companies, such as Monarch Resources are operating underground and other companies are proposing large-scale, open-pit operations. Most multinational mining companies are not yet operating mines, with only three industrial-scale sites in operation. Approximately 30,000 small-scale miners operate in the region, mostly illegally.⁷² The majority are Venezuelan, but at least 2,000 to 3,000 come across the border from Brazil, Colombia, and Guyana, and recent reports suggest the number is rising.⁷³

Most mining companies in Venezuela are referred to in the industry as "junior" companies, although a few large-scale companies ("majors") also have concessions. Many of these companies are based in Canada (*see Box 6*). Junior companies are usually involved in the more speculative exploratory process of mineral development. They may invest between \$10 million and \$40 million, while major companies may invest hundreds of millions of dollars or more in a potentially profitable mining venture. Once an economically viable reserve is identified, a junior company may enter into a joint venture with a major company or another junior company to exploit the resource. The main objective of major mining companies is extraction, but they also spend considerable capital on exploration. Figure 7 shows a typology of small-scale and large-scale mining operations.

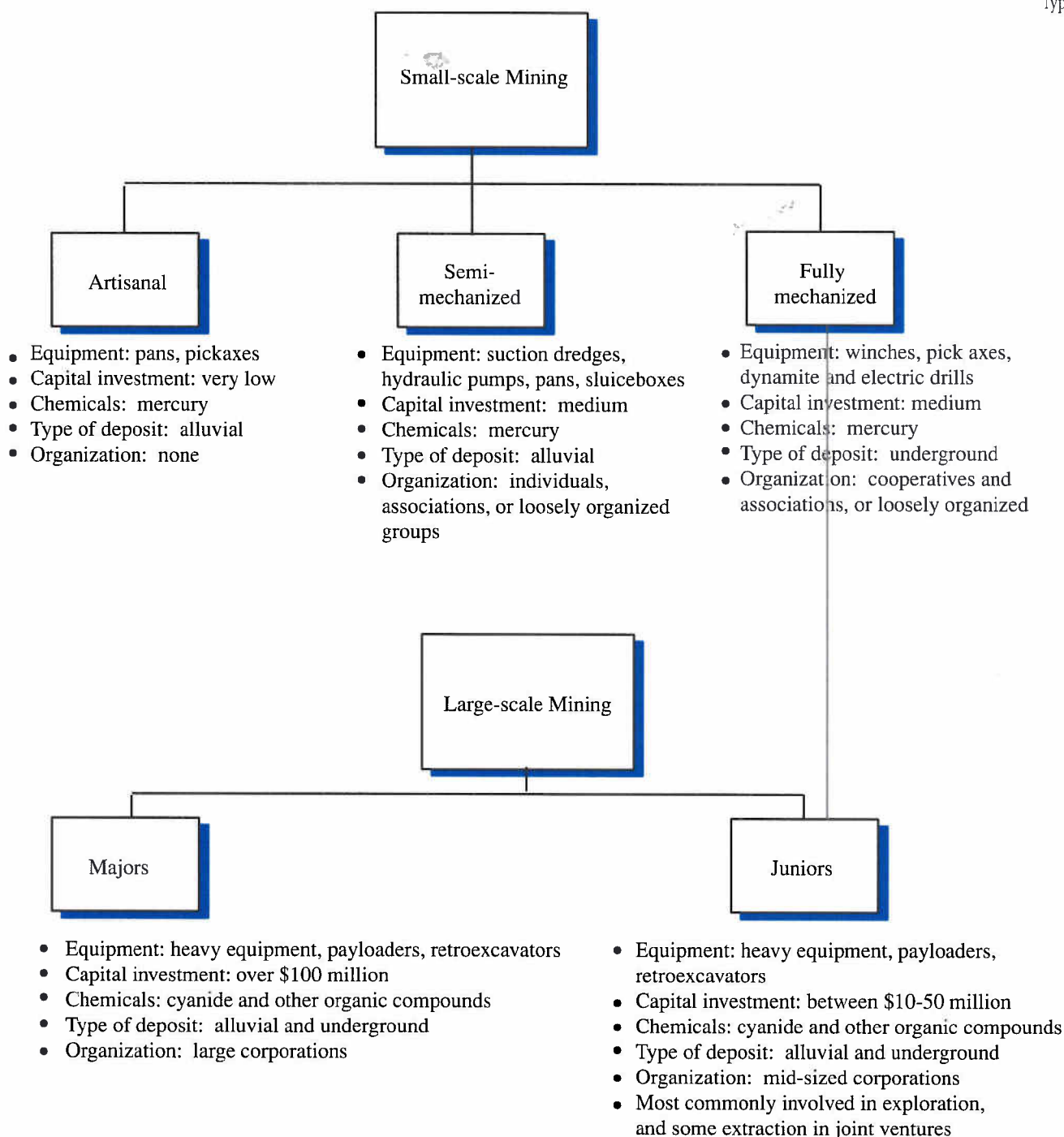
MINING POLICY AND INSTITUTIONS

The Ministry of Energy and Mines (MEM) has the authority to grant concessions for mineral development in Venezuela, although a regional body was given the right to grant contracts under the supervision of the MEM (*see Box 7*). Concessions are granted under the 1944 Mining Law, which states that mining concessions can be given in virtually any publicly held land. In addition, the law provides for artisanal mining, which is allowed on unallocated lands (*tierras baldias*), provided it does not conflict with public interests. Companies win concessions according to their capability to operate a mine — generally interpreted to mean their sufficiency of capital — and to their offers to contribute to community projects or other special programs.

The Ministry of Mines has three professionals to monitor over 400 mining contracts in the Guayana region. None of these inspectors has been trained on the environmental impacts from mining.⁷⁴ The regional Corporación Venezolana de Guayana (*see Box 7*) has no personnel to monitor impacts in the Guayana region, although the agency does provide laboratories and helicopters. The Ministry of Mines' proposed superintendency of mines would employ six professional staff to review environmental impact statements and monitor over 400 existing mining concessions, as well as the activities of an additional 30,000 small-scale miners in the Guayana region.

FIGURE 7

Types of Mining



Source: B. Müller, "Esto es mi ambiente: Aquí tengo vida," 1997.

MINING CONCESSION AGREEMENTS

To obtain a concession, mining companies first request an exploration permit, after which they may apply for the title to a mining concession by presenting a concession plan. Exploration begins after a company has obtained land use and land disturbance permits, which are granted by the Ministry of Environment. Three years after the exploration permit is issued, the concessionaire is required to return half of the explored area back to the government, choosing the half on which the mine will be located. Mining concessions are then awarded for an average of 20 years, after which an additional 20-year renewal can be requested.

In addition to acquiring the necessary permits and concession titles from MEM, the company must also comply with regulations from the Ministry of Environment before beginning construction. These include securing a permit to exploit the resources and filing an environmental impact statement. According to the Penal Environmental Law, all mining operations must engage in reclamation of mine sites, although there is no standard for reclamation practices. In addition, while mining companies are required to provide an environmental impact statement, this need only be in draft form to begin the production phase.

SMALL-SCALE MINING OPERATIONS

Currently, most small-scale miners operate illegally without any formal concession arrangements. Gold is the most commonly exploited mineral in the Guayana region, but some operations target other valuable deposits, such as diamonds (*see Box 8*). Before beginning mining operations, small-scale miners must locate the source of gold. Because they often lack technical equipment and geological expertise, much time and energy is initially devoted to following false leads. Miners may blast hillsides with high-pressure water (hydraulic mining), only to find that they contain no gold, or they may follow a quartz vein (underground mining)

that contains no gold.⁷⁵ In Venezuela, small-scale miners use sluice boxes, suction dredges, hydraulic pumps, and mechanized equipment, sometimes in combination.⁷⁶ Although mercury use for mining is banned in the region, it is commonly used in combination with all of these methods. To distinguish gold particles from ordinary sediment, mercury is washed with gold-bearing sediment which induces gold particles to join, or amalgamate, with the mercury. Once gold-bearing rock has been identified, the miner takes this material to a mill for processing, after which the crushed material is then mixed with mercury and burned, allowing the mercury to disappear as vapor.

7 ENCOURAGING MINERAL DEVELOPMENT IN THE GUAYANA REGION

Based in Puerto Ordaz, Bolívar state's industrial center, the Corporación Venezolana de Guayana (CVG) is a conglomerate of state-owned industrial companies, some of which are involved in mining activities. During the early 1990s, the CVG had the power to award mining permits in Bolívar state, through decrees 1409 of December 1990 and 3281 of December 1993. These measures were meant to facilitate mineral exploration in the Guayana region by making mining concessions easier to obtain. Technically, the CVG granted mining contracts as joint ventures between one of its affiliates and a national or international company, with the understanding that the CVG would apply for a formal mining

concession through the Ministry of Mines on behalf of the companies involved.

In reality, contracts issued by the CVG were not well coordinated with central government authorities. The CVG awarded over 300 contracts in the Imataca Forest Reserve, many of which went to CVG affiliates.¹ These contracts were issued independently of the 92 concessions in the same area awarded by MEM and were not officially titled through the Ministry of Mines. As a result, the lack of a standard, accurate mining cadastre has led several companies to claim the same concession. For example, the Canadian "junior" Crystallex International claims that the two most valuable parcels of Placer Dome's concession were awarded

to a Crystallex subsidiary under an earlier concession with the Ministry of Mines. Placer Dome was awarded the parcels at a later date under a CVG contract. A lawsuit filed by Crystallex was decided in favor of Placer Dome, and Crystallex has now appealed.

Furthermore, CVG contracts have not systematically followed environmental regulations and requirements by the Ministry of Environment. In 1992, nearly half of the 23 contracts in operation in the upper Caroní river basin, did not have the required permits from the Ministry of Environment.² Some contracts were awarded in and around protected areas, including Canaima National Park, which was illegal.³ Both decrees 1409 and 3281 were challenged in

court as unconstitutional and in June 1996, the CVG's power to award mining contracts was revoked through Decree 1384, which re-established this task as a responsibility of the Ministry of Mines.

Notes:

1. W. Franco et al., "La Situación Actual en la Reserva Forestal Imataca y Propuestas para Orientar su Ordenamiento," (Ministry of Energy and Mines, March 1997), p. 45.
2. A. Sartorio de Ponte, "La Explotación de Oro y Diamantes: Estado Bolívar, Cuenca Alta del Río Caroní, Venezuela" Unpublished report (AVVA/ Coalición Orinoquia: Caracas, April 1997).
3. Senate Environment Committee, "Minería dentro de las áreas protegidas del Estado Bolívar y Caso Friedland" (Caracas, 1994).

Approximately half of the small-scale miners in Bolivar state are organized in 12 cooperatives and 76 associations covering hydraulic mining, dredging rivers, or underground mining.⁷⁷ Cooperatives provide basic health care and education services and often prohibit alcohol consumption or prostitution in mining communities. Semi-organized mining consists of work teams of local miners who have no other organizational structure and who operate using the same techniques as organized miners. Unorganized individual miners who operate solely with rudimentary panning methods are rare.⁷⁸

THE ENVIRONMENTAL AND SOCIAL IMPACTS OF SMALL-SCALE MINING OPERATIONS

Small-scale mining can result in a range of negative environmental and social impacts (see Table 4).

Soil and Water Damage

Although underground mining generally has less dramatic environmental impacts than other forms of small-scale mining, it carries the potential for a collapse of the underground shaft. In addition, the movement of large amounts of waste rock and vegetation can lead to the same pollution problems as an industrial mine, such as acid mine drainage which is discussed further in this section.

Most small-scale mining operations increase sedimentation in rivers, especially through the use of hydraulic pumps and suction dredges. By blasting hillsides with water under high pressure, hydraulic pumps leave scars on the landscape, which may take years to develop even the lightest covering of vegetation.⁷⁹

According to a study published by the local electric company in Bolivar state, EDELCA, in 1991, small-scale mining using both suction dredges and hydraulic pumps increased the sediment load in the Caroni River ten times over what could be considered normal.⁸⁰ Deforestation, contributing to erosion and loss of fauna, is also associated with small-scale mining. The same EDELCA study found that small-scale mining had eliminated over 60 percent of the vegetation in an 8,000 square kilometer area, most of which had been forested.⁸¹ Since most small-scale miners do not preserve the topsoil removed before excavation begins, this topsoil is often washed away into surface water, carrying with it ecologically valuable seed banks that are necessary for the regeneration of vegetation. In addition, few small-scale miners engage in reclamation or post-mining recovery practices.

Damage from Mercury Use

The use of mercury in small-scale mining techniques has health and environmental consequences. Mercury is discharged into the environment when miners fail to recover mercury tailings, either by dumping waste directly into rivers or by releasing mercury vapors into the atmosphere when the mercury-gold compound is burned. Small-scale miners use inorganic mercury, which is often converted through natural processes into toxic organic and inorganic compounds. Of greatest concern is the highly toxic organic compound, methyl mercury, which forms in rivers and lakes when micro-organisms metabolize metallic mercury. This toxic form of mercury then accumulates in fish and when ingested causes mercury poisoning in humans. Metallic or inorganic mercury can also be hazardous if it is transformed into gas from its liquid state; in a recent case, teenagers in the United States who handled

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DIAMOND MINING

Diamonds, composed of crystallized carbon, are generally found in alluvial deposits. Diamond mining is usually done above ground, but may also involve underground shaft operations.

The most serious environmental impact from diamond mining is surface disturbance during the exploration and production phases. Like gold mining, production of diamonds requires the

movement of massive amounts of rock and soil. Unlike gold mining, however, diamond mines are more benign in terms of waste production, as the process does not require amalgamation and

the host rock, kimberlite, is less likely to produce toxic residuals.

Source: E.A. Ripley et al.,
Environmental Effects of Mining (Delray
Beach, Florida: St. Lucie Press, 1996).

liquid mercury were hospitalized for mercury poisoning after samples of the silvery substance formed a hazardous vapor.⁸²

Although symptoms differ for poisoning by inorganic and organic mercury, both kinds may result in nervous system disorders, birth defects, or death.

Estimates for the amount of mercury released into the environment as a result of small-scale mining vary from 1-4 kilograms per kilogram of gold extracted.⁸³ In the Amazon Basin alone, between 90-120 tonnes of mercury are discharged annually into local rivers.⁸⁴ In Venezuela, the amount of mercury lost in the environment is estimated to exceed 10 tonnes per year.⁸⁵ While the impact of mercury pollution may be severe at the site of mining activity, it is by no means restricted to that area and can affect communities many kilometers away.⁸⁶

In Venezuela, substantial metallic mercury deposits have been found to exist in the bottom of the river where mining is occurring, and as of 1989, fish were beginning to show evidence of mercury contamination.⁸⁷ Nonetheless, without baseline data on the water quality and composition of the river bottom materials before mining began, it is difficult to determine with any certainty how much mercury has been deposited in local riverbeds as a result of small-scale mining operations.



The greatest negative impact on indigenous communities has come as a result of greater exposure to diseases — especially malaria and tuberculosis — against which they may not have immunity.

Social Damage

Because mineral deposits overlap with traditional indigenous territories in the Guayana region (see Figure 6), small-scale mining has often negatively affected the social structures of nearby communities. In general, gold mining in Venezuela has resulted in an increase in migration and colonization to the Guayana region.⁸⁸ Fires are often deliberately set in portions of the El Dorado-KM 88 area to clear forest for mining or to plant crops to feed mining communities.⁸⁹ The greatest negative impact on indigenous communities has come as a result of greater exposure to diseases — especially malaria and tuberculosis — against which they may not have immunity. Pools of stagnant water and waste tailings, which are characteristic of hydraulic operations, can be fertile breeding grounds for malaria-bearing mosquitos.

In late 1996, medical and public health officials confirmed that an outbreak of malaria had killed an undetermined number of Yanomami on the Venezuelan side of the border.⁹⁰ Statistics for the Yanomami living on the Brazilian side of the border indicate that between 1988 and 1990 an estimated 15 percent of the population had died from malaria and other diseases.⁹¹ The Yanomami territory is one of the prime entrance points for Brazilian miners (see Figure 6). Small-scale miners have also been involved in violent conflicts with indigenous peoples. The most recent incident occurred in August 1993, when 16 Yanomami women and children were massacred by miners operating near the Brazilian border.⁹² This brutal massacre still remains unpunished.

Mining has weakened the leadership in indigenous communities and undermined traditional systems of reciprocal exchange and communal labor, while marital disputes and violence within families have increased. Women and children have been particularly affected by the involvement of their menfolk in the mines. Men have neglected traditional subsistence tasks, leaving mothers and children to fend for themselves. Malnutrition is evident in many communities as a result.⁹³

ALTERNATIVES FOR SMALL-SCALE MINING

Much of the environmental damage from small-scale mining comes as a result of improper handling of mercury. Because of its low cost and availability, mercury is preferred by small-scale miners for amalgamating gold. Alternative technologies, such as retorts, can provide a closed system in which excess mercury is recovered, rather than washed away in streams or rivers. A new, inexpensive device developed in the Brazilian Amazon by a German company also shows promise. Consisting of little more than a modified sluice box, this new technology has a gravity trap that fits at the end of the sluice box and a sealed crucible that prevents mercury from being released into the atmosphere. The trap works by slowing down water flow so that excess mercury settles out before reaching the river and the sealed crucible aids in recovering liquid mercury from a condenser.

Used in conjunction with one another, both devices, which have been tested in Ecuador and Colombia, have proved to recover 95 percent of mercury used and 5-10 percent of gold that would have otherwise been washed away. Each item costs approximately \$30 and can be made from scrap metals.⁹⁴ Unfortunately, such techniques are not in use in Venezuela, possibly because few incentives encourage small-scale miners to adopt more environmentally friendly techniques, and information on these practices is not well disseminated.

CORPORATE MINING OPERATIONS

The few gold-mining companies operating in Venezuela extract the resource using open-pit and underground mining techniques. To create an open-pit mine, heavy equipment is used to excavate a pit as large as 2,000 feet deep into the rock, removing large quantities of waste rock — materials that lack significant quantities of gold and other metals — and ore in the

process. The ground water around the future pit must be pumped out using an elaborate network of wells, so that the excavation can proceed downward below the water table.⁹⁵ Industrial underground mines, of which there are two in Venezuela, require the company to dig shafts and to transport gold-bearing rock to the surface.

Once the ore has been removed from the ground, by

either open-pit or underground mining techniques, it must be further processed to extract the gold. At a global level, gold processing has generally involved heap and other leaching or mill flotation processes. All of these processes involve the use of cyanide.⁹⁶ In heap leaching, ore is removed from the ground and put in piles that are sprayed with a dilute solution of cyanide, which combines with the gold. The gold is

later stripped from the cyanide and recovered. In mill flotation processes, gold-bearing ore is taken to a mill where it is crushed and treated with numerous chemicals including sodium cyanide, amines, lime, sodium sulfide, acids and other organic compounds, to extract the gold and possibly other metals. Many of the chemicals, if present in sufficient concentrations, are toxic to terrestrial and aquatic life.⁹⁷

TABLE 4

Potential Environmental and Social Impacts from Small-Scale and Industrial Mining

STAGE	POTENTIAL IMPACTS FROM SMALL-SCALE MINING	POTENTIAL IMPACTS FROM INDUSTRIAL MINING
Site preparation	Terrestrial operations (underground and hydraulic processes) <ul style="list-style-type: none"> ■ Erosion ■ Run-off sediment/ increased suspended sediment load to surface water ■ Deforestation ■ Soil loss 	<ul style="list-style-type: none"> ■ Erosion ■ Run-off sediment/ increased suspended sediment load to surface water ■ Deforestation ■ Habitat loss and fragmentation from road and site construction
Development	<ul style="list-style-type: none"> ■ Habitat loss ■ Erosion of sediments/ increased sediment load in surface water ■ Collapse of underground mine shafts ■ Water pollution/ water quality degradation ■ Aquatic species loss/ toxicity to aquatic organisms ■ Mercury pollution in rivers and atmosphere ■ Sedimentation in surface water and rivers 	<ul style="list-style-type: none"> ■ Acid mine drainage/ water quality degradation ■ Erosion of sediments/ increased sediment load in surface water ■ Habitat loss ■ Declining species population ■ Increased run-off and subsequent reduction in local groundwater ■ Potential toxicity impacts to organisms (plants, animals, aquatic life) ■ Sludge from treatment of contaminated water
Indirect impact	<ul style="list-style-type: none"> ■ Increase in sexually transmitted diseases, malaria, and other tropical diseases ■ Species population loss due to hunting 	<ul style="list-style-type: none"> ■ Increased colonization due to road development ■ Increased energy requirements ■ Species population loss due to hunting
Post-mining	<ul style="list-style-type: none"> ■ Changes in position and shapes of rivers ■ On-going mercury pollution ■ Continued high sediment loads in surface water 	<ul style="list-style-type: none"> ■ Persistent acid mine drainage and other water quality contamination ■ Possibility for long-term water treatment ■ Potential for persistent toxicity to organisms

Sources: Office of Compliance, Profile of the Metal Mining Industry, Sector Notebook Project (US Environmental Protection Agency: Washington, DC, 1995), p. 29-30; G. MacMillan, *At The End of the Rainbow?: Gold, Land, and People in the Brazilian Amazon* (Columbia University Press: New York, 1995)

At a mill site, two types of wastes are generated: waste rock, and tailings, which is the material left over after processing. Tailings of pulverized rock and processing chemicals are usually sent to an impoundment as slurry. In industrial countries, modern mining practices require that tailings be disposed of in lined facilities, which can be constructed of synthetic or natural materials. Sometimes tailings are discarded directly into the environment without being held in an impoundment site (see discussion below on BHP and Placer Dome's operations in Papua New Guinea).

THE ENVIRONMENTAL AND SOCIAL IMPACTS OF INDUSTRIAL MINING

Mining on an industrial scale can produce environmental damage resulting from exploration and development, long after the mine has closed (see Table 4). The exploratory phase generally causes the least impact, although drilling holes to determine the existence of gold deposits may involve transporting track-mounted drill rigs across the concession and building secondary roads if initial drilling results are encouraging. Such activity can fragment the local habitat and increase access to otherwise remote areas. The most significant impact occurs during the operational phases or after active operations have ceased.

Soil and Water Damage

Mining, especially open-pit mining, generates enormous quantities of waste compared with any other natural resource extractive activity.⁹⁸ In 1992, gold mining in the United States generated over 540 million metric tons of waste rock and tailings to produce 329 metric tons of gold; that is, gold accounted for only 0.00006 percent of waste produced.⁹⁹ While Venezuela's gold is of a higher grade than that extracted in the United States, gold mining will still produce significant waste. Gold from vein deposits is estimated to contain an average of 16 grams per tonne, or only 0.0016 percent of the ore extracted. Sedimentary deposits contain even less gold per tonne — 0.2 grams/tonne or 0.0001 percent of the ore extracted.¹⁰⁰

Water interacts with these wastes to generate contaminated fluids that can pollute soils, rivers, and ground waters. These fluids can be highly acidic and metal-laden or highly alkaline, and they often contain various forms of cyanide, depending on the waste source. Although tailings are often deposited in lined facilities, leaks are not uncommon.¹⁰¹ High rainfall, typical in the Guayana region, can aggravate this problem by causing tailings ponds to exceed their recommended capacity and either overflow or rupture dams, contaminating groundwater and nearby streams, as was the case at the Omai mine in Guyana (see Box 9).



Mining on an industrial scale can produce environmental damage resulting from exploration and development, long after the mine has closed.

Acid mine drainage can occur when water and air come into contact with geologic material containing iron sulphide, as in abandoned waste piles and tailings. Such drainage can contaminate nearby streams and ground water for centuries after a mine has closed.¹⁰² The tendency to form acid mine drainage can be aggravated by high rainfall and high temperatures. Citing acid mine drainage as the most costly and difficult reclamation problem on mines operating in national forests, a U.S. Forest Service study concluded that such contamination affects between 5,000–10,000 miles of streams in the western United States.¹⁰³ While gold deposits in the Guayana region have been identified as containing low sulphide levels, acid mine drainage is still a distinct possibility when exposing deeper rock material, and the existence of large sulfide deposits cannot be completely ruled out.¹⁰⁴

The use of toxic chemicals during the processing stage requires careful handling and oversight. When exposed to sunlight, some forms of cyanide break down and can be easily recovered and recycled, but others do not and may persist in the environment for decades.¹⁰⁵ In addition, cyanide and other toxic metals have been released when tailings ponds failed (see Box 9). If containment structures are not well planned and maintained, untreated tailings containing toxic materials can seep into groundwater or escape into nearby streams, seriously affecting the health of local populations. This may be an additional challenge in the Guayana region, where the water table is near the surface.¹⁰⁶ Even when drinking water standards are followed, however, tailings containing heavy metals may negatively impact aquatic life, if present in sufficient concentrations. Because many metals bioaccumulate, consumption of contaminated fish can be harmful to humans.¹⁰⁷

Damage to forest cover is smaller in scale and more localized for mining concessions than for logging concessions. However, both increase access to otherwise remote forest areas and provide an outlet for further activities, especially in places where population pressures already exist, such as the Imataca Forest Reserve. Almost half of this reserve has already been allocated to exploratory mining concessions (see Figure 8).

Social Damage

To the extent that large-scale mining creates new infrastructure and provides additional employment, permanent settlements can arise around these operations in areas that might have otherwise remained more sparsely inhabited. In Venezuela, the Canadian junior company, Yellowjack Resources, was heavily criticized by indigenous peoples' groups and environmentalists for "aggressive and disrespectful behavior of Canadian staff at the mine site towards a delegation of indigenous people and environmental campaigners."¹⁰⁸ Yellowjack and its associated joint venture partners have since left Venezuela.

The Kariña of Bolívar state complain that since the installation of the Canadian mining company, Monarch, near their communities, miners have abused women and threatened men.¹⁰⁹

Conflicts between small-scale miners and mining companies have also begun to erupt, as the miners begin to find that areas previously open to extraction are now under the control of a private company. Groups of small-scale miners have been invading the concessions of the Canadian junior, Monarch, and the British company, Greenwich Resources. Efforts by the National Guard to evict small-scale miners from mining concessions have resulted in violence, as recently as January 1997.¹¹⁰

ALTERNATIVES FOR LARGE-SCALE MINING

Underground mining affects surface vegetation and habitats far less than open-pit mining. However, this method may not be appropriate for all types of deposits found in the Guayana region. Nevertheless, even in open-pit operations, mitigating measures can lessen the environmental impacts from mining (*see Box 10*). Many of these measures involve careful waste management and separating toxic materials from water sources. Guidelines and principles for mining operations have been established in several developed countries. One such set of guidelines — the Whitehorse Mining Initiative — was established in Canada and signed by a number of mining companies, including

Placer Dome. The initiative addresses a broad range of issues of interest to mining companies, governments, and communities, but some of the specific environmental and community guidelines recognize the importance of maintaining healthy ecosystems and the rights of indigenous peoples.¹¹¹ However, the initiative is still new and its implementation is not complete.¹¹²

HOW ENVIRONMENTALLY AND SOCIALLY RESPONSIBLE ARE INDUSTRIAL MINING COMPANIES?

Official documents state that medium and large-scale mining companies will be given priority in the development of Venezuela's gold mines.¹¹³ Clearly large-scale mining companies would be

9 OPERATING ACCORDING TO BEST PRACTICES?: THE OMAI DISASTER

Located in Guyana, the Omai Gold Mine is operated by Cambior, Inc., and Golden Star Resources, both Canadian junior mining companies. The government of Guyana has a 5 percent interest in the operation. Cambior has been cited for environmental offenses in its Quebec mines, but Cambior assured critics that its Omai mine in Guyana would operate according to "North American standards."

However, on August 19, 1995, the tailings pond dam at the Omai Gold mine failed, spilling 860 million gallons of cyanide-laced tailings into the

Essequibo River, one of the country's major waterways. Tailings sediments were reported as much as 50 miles away, and as many as 11,000 fish were reported killed. The spill affected the country's Amerindian communities, many of whom live along the Essequibo and depend on the river for fish and water. Caribbean countries that normally import fish from Guyana banned Guyanese seafood imports after the spill. President Cheddi Jagan called the incident a major environmental disaster and requested assistance from U.S. experts on how to handle the spill. The

mine was temporarily closed to repair the tailings dam, but has since re-opened.

Fortunately, there were no deaths or injuries, and the Guyanese government and the companies responded relatively quickly to the accident. While such large-scale spills are less frequent than smaller leaks, the Omai incident is recent and demonstrates some of the challenges of working in a high rainfall environment. One of the key lessons learned from the Omai tailings spill is that strict environmental regulations and adequate oversight must be in

place to avoid such disasters. Because Guyana had no environmental statute, no policy for environmental regulation existed. Other than a vague contract referencing the company's obligation to protect land and water resources from the impact of the mine, no standards dictated how the mine should operate, much less how the site would be reclaimed.

Source: C.D. Da Rosa, *Golden Dreams, Poisoned Streams: How Reckless Mining Pollutes America's Waters and How We Can Stop It* (Washington, DC: Mineral Policy Center, 1997, p. 22-23).

easier to control than illegal small-scale miners. Large industry players, such as Placer Dome and Broken Hill Proprietary, Inc. (BHP) are among those companies seeking or holding concessions in Venezuela. Some of these more established companies have environmental and social policies and, therefore, tend to be more responsive in complying with environmental regulations.¹¹⁴ In fact, the mining industry, led by BHP, has taken the lead in promoting an Environmental Code of Conduct for mining in Venezuela.

In its promotional literature, Placer Dome emphasizes its commitment to the environment and the development of communities surrounding its operations. On its web page, the company asserts, "We believe in . . . responsible environmental stewardship and the provision of a safe and healthy workplace for our employees."¹¹⁵ BHP's corporate documents state that the company applies, "standards that effectively minimize adverse impacts arising from our operations, products and services" and seeks to apply its environmental policy even in places where regulation is lacking.¹¹⁶

In Venezuela, Placer Dome has proposed establishing a small-scale mining cooperative concession to allow small-scale miners access to alluvial gold on the Las Cristinas concession, with the technical advice and assistance of Placer Dome engineers. This area, which is of little economic interest to the company, would be operated by miners from a nearby community. In this way, the company hopes to lessen the possibility of invasion by miners who had previously worked the area on which Las Cristinas is located.

The need for strong government regulation, oversight, and an informed civil society.

The level of enforcement and regulation varies widely between and even within countries. Many developing countries, such as Bolivia, Guyana, Papua New Guinea, and the Philippines¹¹⁷ either do not have adequate capacity to monitor the activities of mining companies or allow practices that would be illegal in developed countries. Even in the United States, where standards are thought to be among the highest, the state of Nevada does not have reclamation standards.

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GUIDELINES FOR RESPONSIBLE MINING

Avoiding environmental damage involves careful and sometimes costly remediation and prevention measures. Implementing measures such as those listed below can help mitigate environmental impacts and avoid costly accidents.

■ **ADEQUATELY MANAGE RAINFALL RUNOFF.** It must be ensured that in mining sites excess rainfall will not cause the leaching solution to overflow into nearby streams and groundwater. This is particularly critical for mines located in the tropics, where high rainfall is characteristic throughout the year.

■ **CONTROL SURFACE WATER.** To avoid contamination, streams and runoff should be diverted from the mine, and measures should be in place to prevent silt from being washed away into nearby water bodies.

■ **MONITOR LEACH PADS, PIPING SYSTEM, AND IMPOUNDMENTS FOR LEAKS.** If a cyanide leaching system is used, the protective liners must be carefully monitored for leaks to avoid ground-water and surface water contamination. If synthetic liners are planned, two protective layers should be used, along with a leak detection system between the liners and a back-up clay liner below the synthetic liner. For both flotation and heap leaching processes, monitoring wells should be required and frequently tested to evaluate the ground-water. Waste rock should also be monitored to avoid contaminated runoff into surface water.

■ **PROTECT WILDLIFE AND NEARBY COMMUNITIES.** Wildlife should be prevented from accessing tailings ponds, and all discharges leaving the mine site must be treated to be

safe for aquatic life and for people.

■ **RECLAIM AND LANDSCAPE MINING SITES AFTER OPERATIONS ARE COMPLETE.** All wastes should be capped with impermeable clay layers, runoff must be treated and controlled, and prevention measures for acid mine drainage should be in place. Hills should be contoured to avoid erosion and the landscape should be attractive.

■ **MONITOR THE MINE SITE OVER THE LONG TERM, EVEN AFTER THE SITE HAS CLOSED, AND TRAIN LOCAL COMMUNITIES TO CONDUCT WATER QUALITY TESTS.** Periodic ground- and surface water tests should be conducted and a corrective plan for acid mine drainage or toxic leaks established. Local communities can be trained to conduct simple water quality tests to help monitor mine activities.

■ **REQUIRE MONITORING BY A CITIZEN OVERSIGHT BOARD.** Before concessions are awarded, a citizen oversight board should be established to monitor the actions of the mining company locally.

■ **REQUIRE PERFORMANCE BONDS THAT ADEQUATELY REFLECT POTENTIAL COSTS TO THE ENVIRONMENT.** Mining companies should be required to post a bond that would reflect potential costs should there be a disaster or long-term water quality problem at their mining site.

Source: Adapted from Mineral Policy Center, "Guidelines for Responsible Mining." Unpublished document, 1996

Placer Dome has a record of spills at other mines where it has operated. Placer Pacific, a Placer Dome subsidiary based in Australia owned 40 percent of the Marcopper gold mine in the Philippines, where 15 million tonnes of tailings escaped into the nearby Boac River in 1996. The mine was closed in early 1996. In its latest annual report, the company attributed its 1996 losses to the Marcopper tailings spill.¹¹⁸ In another case, the Porgera mine in Papua New Guinea has been dumping tailings into the Maiapam-Strickland River, a practice that would not pass effluent standards in Australia or the United States. The company maintains that storing heavy lead tailings in a contained pond is not feasible at Porgera because of the area's unstable terrain, seismic activity, and heavy rainfall.

BHP acknowledges that its copper and gold mine in Papua New Guinea has caused serious environmental damages in the Ok Tedi watershed, including increased sediment loading in the river, alteration of the course of the river, increased flooding, and loss of forests.¹¹⁹ Since it first began operating in 1984, the mine has been releasing 80,000 tonnes per day of untreated tailings into the Ok Tedi River. The Ok Tedi River, a tributary of one of Papua New Guinea's main rivers, provides fish and irrigates garden plots in nearby communities. When the mine was built, BHP officials negotiated with the government to allow the company to bypass existing regulations and dump tailings directly into the river,

alleging that the region was too unstable to support a tailings dam. Indeed, a tailings dam built during the early construction phase of the project collapsed because of landslides.¹²⁰ In 1994, after communities living near the mine filed a lawsuit against the company, BHP agreed to search for ways to reduce the amount of tailings entering the Ok Tedi river system. The company has also established a trust fund for communities in the region to ensure that they benefit from BHP's activities and are not affected after the mine is closed.¹²¹

The risks posed by junior companies.

In Venezuela, numerous juniors are currently exploring for gold and diamonds. One such company is Diamondworks, which also explores for gold in China and diamonds in Africa. The company's properties in Venezuela were acquired through incorporation of Carson Gold's concessions in the KM88 region near Las Cristinas. Diamondworks is supported by Robert Friedland, who is involved in other international mining operations. In the 1980s, Friedland founded Galactic Resources, a U.S.-based gold company that obtained a concession in Summitville, Colorado. Between 1986 and 1992, acid mine drainage from that mine polluted the nearby Alamosa River with cyanide, sulfuric acid, and heavy metals. In 1992, Galactic Resources declared bankruptcy, and the site is now on the National Priorities List of the Superfund clean-up program.¹²² The U.S. Environmental Protection Agency estimates that clean-up costs could exceed \$100 million.

Robert Friedland owns the private holding company, Ivanhoe Capital Corporation, a venture capital company that markets mining projects, and is located in Singapore. In the early 1990s, he used Ivanhoe Capital to promote a new mining venture in Venezuela through the subsidiary Venezuelan Goldfields. When drill tests on the exploratory concession were disappointing, the company's stock price fell and Friedland withdrew his investment. Since Friedland's ventures are highly speculative, they imply high risks not only for investors,¹²³ but also for the area where his operations take place, if an environmental disaster occurs. Because assets from Ivanhoe Capital are held in Singapore, it would be difficult for any government to get at this capital, should the subsidiaries declare bankruptcy or close a mine.

3.3 THE IMATACA ZONING PLAN: A NEW PRECEDENT FOR ZONING AND MANAGEMENT IN FOREST RESERVES?

Located in Bolivar and Delta Amacuro states, the 3.2 million-hectare Imataca Forest Reserve¹²⁴ represents the largest reserve where logging is taking place, and wood from the reserve comprises 11 percent of Venezuela's total timber production.¹²⁵ Created through ministerial resolutions No. 47 of 1961 and No. 15 of 1963, Imataca was declared an area of permanent forest production in 1981, and the first timber concessions were awarded in 1982. While forest reserves are generally created by decree, Imataca was created before such a practice was required under the Organic Land Use Zoning Law of 1983.

Currently, there are 12 timber concessionaires operating in the reserve, in an area equivalent to 1.2 million hectares. The reserve also overlaps with the state's primary gold mining districts, and significant deposits of gold and diamonds have been identified within its boundaries. In fact, in 1965, a portion of the reserve was declared open for mining, according to Decree 375.¹²⁶ Since then, the southern portion has been a key site for mining activities, both by small-scale miners and formal mining concessions. There are at least 300 concessions and contracts in the Imataca Forest Reserve, most of which were granted by the CVG, but the exact number is under debate. Most of these are in the preliminary exploratory phase.¹²⁷

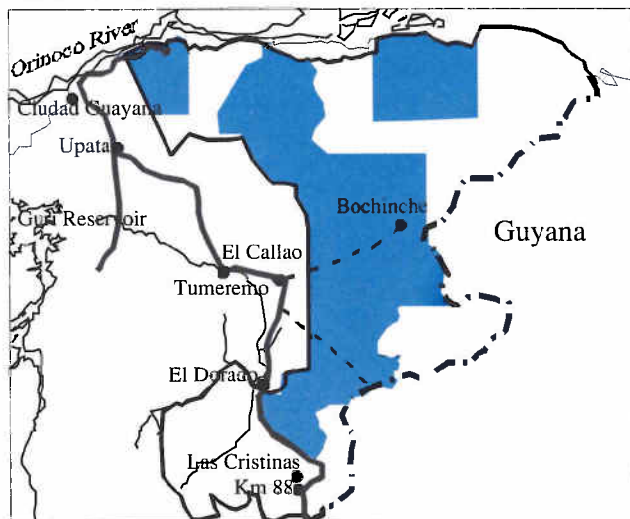
In May 1997, the administration passed Decree 1850, establishing a zoning plan for the Imataca Forest Reserve, which dedicated almost half of the reserve to mining. The plan was initially developed in December 1996 by a team of forest engineers and geographers within the Ministry of Environment. The approved zoning plan designates five management zones in the reserve for forest management, management of the floodplain, special investigation, protection, and mixed management (see Figure 8). As is evident from Table 5, the zones indicate little variation in the designation of permitted activities.

Mining appears to have been given high priority in the zoning plan. Not only is this the primary activity on almost half of the reserve, but any concessions previously granted outside of the mixed management zone are legalized in Article 39 of Decree 1850.¹²⁸ Furthermore, as is shown in Figure 8, the management

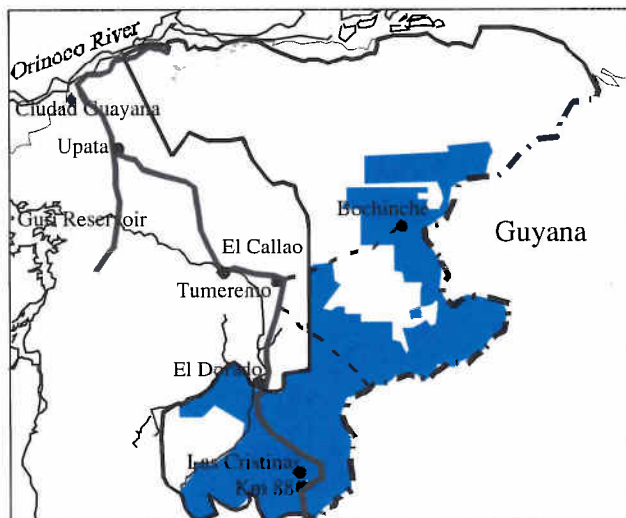
FIGURE 8

Zoning Categories and Existing Mining and Logging Concessions in the Imataca Forest Reserve

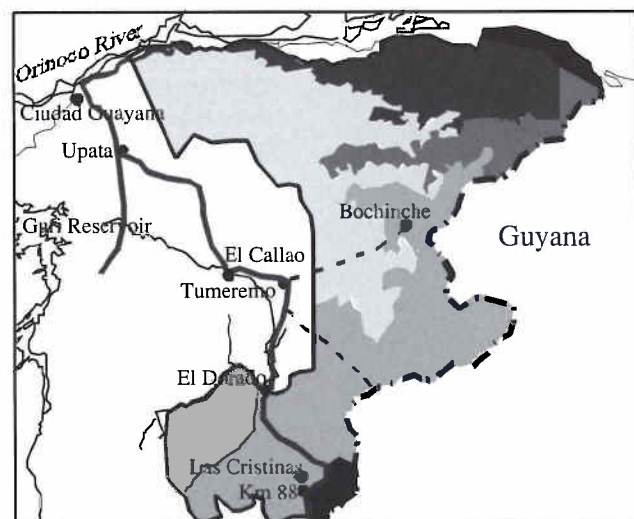
Existing Timber Concessions



Mining Contracts and Concessions



Zoning Categories According to Decree 1850



- Forest Management Zone
- Mixed Management Zone
- Special Investigation Zone
- Management of the Floodplain
- Protection Zone
- Timber Concessions
- Mining Concessions and Contracts
- Primary Road
- Secondary Road

0 100 Km

Source: SEFORVEN, November 1997

zones appear to have been established primarily on the basis of existing concessions rather than specific ecological or social criteria.

An analysis of the zoning plan raises technical issues:

■ **Public consultation and participation.** Venezuelan law requires that the government hold a public consultation before approving management plans. On May 7, after three cancelled public hearings, the Ministry of Environment scheduled a consultation in the region. Those present at the meeting requested an extension until the end of the month to prepare comments, noting that they had received necessary documents only a few days before the meeting. Despite the fact that the extension was granted, one week later, on May 14, the zoning plan was approved by the President's Council of Ministers.¹²⁹ On July 3, 1997, hundreds of citizens protested the Imataca Zoning Plan in downtown Caracas, including 89 Pemon indigenous peoples.¹³⁰

■ **Weakly defined protected areas.** The Imataca Forest Reserve contains 14 different forest ecosystems¹³¹ and 11 endemic plant species.¹³² However, the zoning plan defines only two protected

zones that comprise less than 4 percent of the reserve. These are open for timber extraction and are isolated from one another.¹³³ Such a designation appears to be inconsistent with Venezuela's policy for protected zones in forest reserves, which Decree 2214 defines as those areas "deemed to contain fragile ecosystems which merit absolute protection without allowing any modification in the natural environment. Thus, there should be no human-related activities or public use allowed in this zone."¹³⁴ In 1994, a project carried out under the Venezuelan Forest Service defined a protected forest corridor for the reserve, which apparently was not taken into consideration in the development of the Imataca zoning plan (see Box 11).

■ **Lack of an indigenous community zone.** The reserve overlaps with the territories of the Warao, Arawak, Kariña, Pemon, and Akawaio indigenous communities, many of whom were living there before the reserve was created. The decree only mentions indigenous peoples in an article establishing a "Preservation of Human Settlements Program," which will apparently aim to maintain the cultural identity of indigenous groups, without any

recognition of claims to the land on which they live.

Lack of secure land tenure has created problems in other parts of the world for local communities faced with mining developments. In Suriname, the Maroons living near the Gross Rosebel gold mining site risk being forced to relocate because of the impacts the mine will have on their territories. The Maroons have complained of intimidation by officials from the Canadian-based mining company.¹³⁵ In Australia, however, indigenous communities with secure land tenure have been able to negotiate agreements with mining companies operating near Kakadu National Park.¹³⁶

■ **Lack of consideration for the environmental impact of migration to the region.** The decree does not contemplate the indirect effects of permitting mining in the reserve, such as an increase in migration and construction of settlements. Not only is migration likely, it is implicitly encouraged, because the government has promoted the new emphasis on mining as an employment-generating opportunity.¹³⁷ The government's difficulty in controlling access to the reserve has already been cited as a primary issue

regarding its management.¹³⁸ Increased settlements imply additional environmental damage, including a decrease in the number of species caused by hunting and deforestation.¹³⁹

■ **Lack of a monitoring program for timber extraction or mining.**

There is no provision for monitoring the impact of extractive activities undertaken within the reserve. Ideally, this should be a part of the research program outlined in the decree, but this focusses primarily on inventory and exploration oriented toward maximizing the extraction of timber and gold.

The Venezuelan Supreme Court is deciding a lawsuit brought by environmentalists over the zoning plan. Another lawsuit on behalf of local indigenous communities is also pending. The Imataca case speaks to the need for a comprehensive conservation and zoning plan for the Guayana region integrated across all government sectors before large-scale extractive activities begin to take place. Such a plan would encourage sustainable forms of development while still maintaining healthy forest ecosystems and watersheds.

TABLE 5

Management Zones in the Imataca Forest Reserve and Permitted Activities

ZONE	SIZE (HECTARES)	ACTIVITIES PERMITTED
Forest management	1,308,800	forestry, research, defense, industrial, recreational tourism, residential (rural)
Management of the floodplain	560,240	forestry, research, defense, industrial, residential (rural), recreational tourism, mining
Special investigation	261,840	forestry, research, defense, recreational tourism, residential (rural)
Protection	127,000	forestry, research, defense, recreational tourism, residential (rural)
Mixed management	1,383,019	forestry, research, defense, residential (rural), recreational tourism, mining, industrial

Source: GOV, "Decree 1850", (Gaceta Oficial, no. 36215, May 1997).

3.4 CAN NATIONAL PARKS AND NATURAL MONUMENTS ADEQUATELY PROTECT FORESTS IN THE GUAYANA REGION?

Venezuela's national parks and natural monuments provide an important cornerstone for conserving the nation's forest ecosystems (see the section highlights box). Eighty-five percent of the country's national park system protects at least some portion of the forest biome.¹⁴⁰ But many forest ecosystems fall outside of the

SECTION HIGHLIGHTS:

- National parks and natural monuments are instrumental in helping protect critical watersheds.
- National parks and natural monuments do not adequately protect a representative sample of the lowland forest ecosystems in the Guayana region.
- The government has trouble controlling the encroachment of small-scale miners in national parks, even when it has a clear mandate to do so, in part because there are few officials on the ground in many of the region's parks.

parks. Of the existing 18 types of lowland forests in the Guayana region, only 5 are represented in

the national park system.¹⁴¹ Most of the remaining lowland forest types are contained within

managed use areas, such as forest reserves and protected zones.

According to a recent study, ecosystem services were valued globally at a minimum of \$33 trillion per year, 38 percent of which is estimated to come from forest ecosystems.¹⁴² A more detailed study indicates that the net present value of Venezuela's national parks for watershed protection is over \$200 million.¹⁴³ In fact, conservation efforts in Canaima National Park alone save the government millions of dollars by protecting the Caroni

11 AN ALTERNATE PROPOSAL FOR A PRIMARY FOREST CORRIDOR IN THE IMATAKA FOREST RESERVE

A protection zone is an important component of a forest reserve because it helps to maintain healthy ecosystems on which timber concessionaires depend for commercial tree species. In this sense, the preservation of a variety of characteristic ecosystems within the reserve is an integral part of sustainable management, especially when these ecosystems are linked to one another to prevent ecological fragmentation.¹ In Imataca and in other forest reserves of the Guayana region, several alternative proposals can help policy-makers reach these goals without compromising the economic objectives of the reserve.

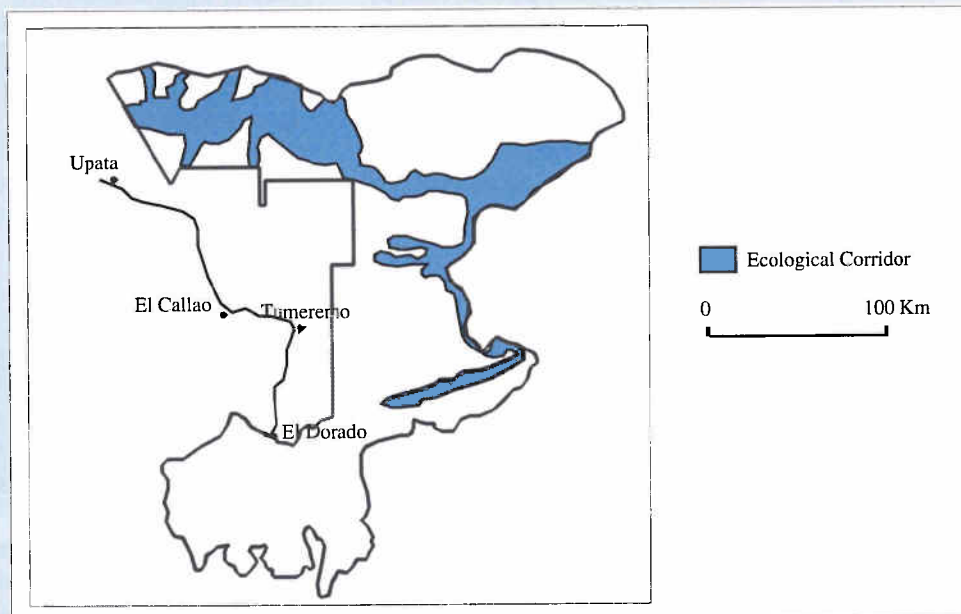
In 1994, the Forest Service developed a project to examine one such alternative: the design of a primary forest corridor inside the Imataca Forest Reserve, taking into account the existence of timber concessions already granted in the reserve. Project investigators emphasized areas not already under timber extraction, which included areas with a slope greater than 30 percent or areas with highly fragile soils. Because these areas were largely inaccessible, they

were not of commercial interest to timber concessionaires, and therefore, did not affect the immediate economic objectives of the reserve. Furthermore, establishment of such a corridor would have promoted the preservation of an important fraction of biota associated with the forest

ecosystems of the reserve. Since in most cases the reserve does not exceed 600 meters in altitude, animal and plant communities would not differ significantly at the higher altitudes of the corridor.

On completion, the idea was formally presented to the leadership of the Forest Service.

However, this proposal appears to have been neglected in the current administration's zoning plan for the reserve. Indeed, the protected areas contained in the zoning plan do not form a part of the proposed forest corridor, nor are they interconnected in any way.



Note: 1. Numerous scientific studies justify biological corridors as a method of conserving biodiversity. See Miller et al., "Linking Protected Areas," paper presented at the Albany, Australia Conference on Protected Areas, November 1997.

Source: MARNR, "Propuesta para el establecimiento de un Reservorio de Genes en la Reserva Forestal de Imataca, Estado Bolívar," (SEFORVEN: Caracas, unpublished document, 1995).

river watershed, on which the country depends for over 70 percent of its electricity.¹⁴⁴ By protecting watersheds, national parks are estimated to provide more than half of the potable water for Venezuela's cities.¹⁴⁵

NATIONAL PARK POLICY

The zoning, administration, and management of national parks and natural monuments is defined in Decree 276, which establishes the norms for land use, including limited recreation. Mining and logging are expressly prohibited within park and monument boundaries.¹⁴⁶ All protected areas are established by presidential decree, and land-use plans are

prescribed as major management guides for protected areas.¹⁴⁷ In reality, many of the protected areas do not have zoning and management plans — only 24 of the 43 national parks and 5 of the 46 natural monuments have zoning plans (see Table 6). Except for the eastern portion of Canaima National Park, none of the national parks and natural monuments in the Guayana region have legally approved zoning plans.¹⁴⁸

PARK ADMINISTRATION

National parks are administered through the National Park Service (INPARQUES), which reports directly to the Ministry of

Environment. Currently, INPARQUES is operating on an annual budget of \$34 million, approximately 5.5 times the amount allotted in the previous administration. This dramatic increase is due to a World Bank loan that disburses over five years and represents almost 70 percent of INPARQUES' annual budget. Disbursement has recently started.

Not all of INPARQUES' budget is invested in the National Park System. It can also be spent on the extensive network of urban and suburban recreational parks or zoos administered by the agency. For example, in 1991, only 10 percent of INPARQUES'

budget was spent on the National Park System, while 61 percent was spent on urban recreational parks.¹⁴⁹ The World Bank loan may modify this trend; of the total, 85 percent will be invested in national parks with the remainder spent on recreational parks and wildlife refuges. Sixty-four percent of the loan will be spent on infrastructure and equipment, while 19 percent will be spent on personnel.¹⁵⁰

Parks in the Guayana region suffer from a lack of infrastructure, equipment, and adequately trained personnel, particularly rangers and guards.¹⁵¹

TABLE 6

Conservation Status of National Parks and Natural Monuments in the Guayana Region*

NAME	AREA (HA.)	PERSONNEL ON THE GROUND	ZONING PLAN IN PLACE	ACTUAL AND POTENTIAL IMPACTS
Canaima National Park	3 million	Yes	Partial	Tourism, fires, hydro-electric projects, proposed electrical line
Jaua Sarisarinama National Park	330,000	No	No	Tourism
Serrania La Neblina National Park	1.36 million	Yes	No	Mining
Yapacana National Park	320,000	No	No	Mining, tourism
Duida Marahuaka National Park	210,000	Yes	No	Mining, tourism
Parima Tapirapeco National Park	3.42 million	No	No	Mining
Natural Monuments ¹	1.1 million	Only in 1	No	Mining and tourism in 3 monument sites

*Includes only those parks and monuments that are at least 10 percent forested.

¹ There are 27 natural monuments in the region. Twelve of these occur within either Canaima or Parima Tapirapeco. Only Sierra Maigüalida Natural Monument has any personnel.

Source: Comisión Permanente del Ambiente y Ordenación Territorial, "Diagnóstico Actual de los Parques Nacionales de Venezuela, Enmarcados en la Gestión de INPARQUES y del Ministerio del Ambiente y de los Recursos Naturales Renovables: Acuerdo de la Cámara del Senado Sobre el Parque Nacional Morrocoy," (Senado de la República: Caracas, January 1997)

National parks make up more than one quarter of the Guayana region, yet few parks have personnel (see Table 6). Canaima National Park has only 14 staff to manage 3 million hectares, or a ratio of over 214,000 hectares per employee, far in excess of IUCN guidelines.¹⁵² Even in Canaima, staff in the eastern sector have no radio communication or fire-fighting equipment and are forced to move around the 1.5 million hectare eastern sector with badly maintained bicycles.¹⁵³ INPARQUES has also suffered from instability at the highest levels; in the last four years the Park Service has had five different presidents, making the establishment of a long-term policy difficult. The government itself has recognized the negative effects political interference has had on establishing environmental management policies.¹⁵⁴

THE IMPACT OF EXTRACTIVE ACTIVITY AND DEVELOPMENT PLANS

Almost all of Venezuela's parks are affected by human-related activity; by 1991, 83 percent of all parks had some kind of human occupation, 17 percent had illegal mining, and 90 percent had illegal hunting.¹⁵⁵ Parks in the Guayana region suffer primarily from illegal mining and tourism (see Table 6). For example, during peak tourism seasons 100,000 to 150,000 people travel along the highway that passes through the eastern portion of Canaima National Park.¹⁵⁶ Tourism in this sector and on Mt. Roraima has resulted in littering; illegal gathering of rock samples, plants, and animals; as well as wildfires.¹⁵⁷



Parks in the Guayana region suffer from a lack of infrastructure, equipment, and adequately trained personnel, particularly rangers and guards.

Despite its prohibition, mining stands out as one of the most significant problems in national parks and natural monuments, particularly those located south of the Orinoco River (see Table 6). At the end of the 1970s, northern Brazil's gold boom began to penetrate the Venezuelan border, especially across the Sierra de Parima (see Figure 6). The incursion of organized Brazilian wildcat miners (*garimpeiros*) motivated the Venezuelan government to create the Parima Tapirapecó National Park in 1991. However, the park lacks the presence of INPARQUES personnel and continues to harbor small-scale miners.

The Parima Tapirapecó Park is not the only focus of small-scale mining activity. Originating in Colombia and Brazil, small-scale miners have been encroaching on other national parks and natural monuments in Amazonas state. Soils in Yapacana National Park have been severely degraded by the activities of approximately 2,000 miners.¹⁵⁸ Until now, neither INPARQUES nor the armed forces have had the political will

to expel these miners. Miners are also operating seasonally with suction dredges and hydraulic pumps in the Serrania La Neblina National Park and in the natural monuments of Sierra de Maigualida, Macizo Cuao Sipapo, and to a lesser extent around Serrania Yutaje Corocoro. Some indigenous communities are reportedly extracting gold near Duida Marahuaka National Park. Of these areas, mining in the Serrania La Neblina National Park could constitute the most serious problem, if effective management of the area is not put in place immediately, because the park borders Colombia and Brazil (see Figure 5).

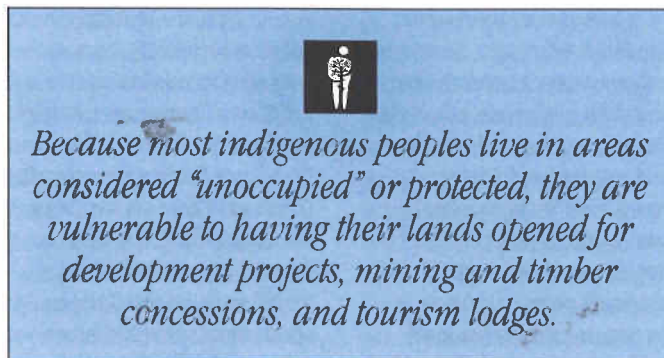
Mining has also occurred along the northern border of Canaima National Park. In the early 1990s the CVG awarded a proliferation of contracts in the Cuyuni and Yuruari river basins, one of which overlapped the borders of Canaima National Park. An investigation by the Senate Environment Commission exposed this situation and demanded that the Ministry of Environment declare

null those portions of the concession that fell inside the park.¹⁵⁹ While the administration acknowledged that part of one concession had been mistakenly granted within the park, no mining operations were established and the administration stated its commitment not to allow mining inside park boundaries.¹⁶⁰

Another of the activities that will affect Canaima National Park is the planned construction of a 230-400 kilovolt electrical line for the Guayana region, which would originate from the Guri Dam and continue to the Brazilian border, where it would be joined with another transmission line in Brazil. The objective of this line would be to provide electricity for mining and allow the Venezuelan government to sell electricity to Brazil. Fifty-five percent of the line is scheduled to pass through Canaima National Park. The electrical line would require construction of a service corridor along the length of the line, which would be between 120 meters and 140 meters wide.¹⁶¹ Just in the section of the line constructed south from KM88, over 400 towers would be built, with access roads to nearly every tower.¹⁶² Although the electrical line passes through several indigenous communities, there has been no public consultation on the plan and the environmental impact study has not been publicly released. However, government officials appear to be pushing forward on construction of the line in order to have it operating by December 1998.¹⁶³

BALANCING CONSERVATION OBJECTIVES AND COMMUNITY NEEDS

Many of Venezuela's indigenous peoples live within park boundaries. Until recently, INPARQUES has not sought to manage national parks collaboratively with indigenous or local communities. In the 1960s and 1970s relationships between INPARQUES and local communities north of the Orinoco were based on a policy of relocating communities outside of national parks.¹⁶⁴ This policy has lost favor partly because of an economic crisis in the latter half of the 1980s, as well as a lack of political will to continue applying it. Decree 276 was passed in part to initiate a collaborative approach between INPARQUES and local communities, based on finding common goals between traditional resource users and the conservation objectives of national parks and natural monuments.¹⁶⁵ In part, the decree states that indigenous peoples living within park boundaries have the right to designate a representative, who will act as the primary liaison to park personnel and will participate in the process of defining and revising park regulations.¹⁶⁶



Since 1989, this approach has been applied in every zoning plan developed by INPARQUES. Because of this policy, INPARQUES has conducted workshops with indigenous communities, although the concept has not been implemented systematically beyond the development of zoning plans. Taking this approach would require INPARQUES to add to its management priorities conservation programs in outreach and education within the protected areas it manages. Unfortunately, these sorts of programs are practically nonexistent and lack sufficient personnel to carry them through.

3.5 INDIGENOUS COMMUNITIES AND FOREST ACTIVITIES

SECTION HIGHLIGHTS:

- Venezuela's indigenous peoples are not well protected from a legal perspective — over 70 percent lack any legal land rights.
- Indigenous peoples depend on forest products for food, construction materials, and traditional medicines.
- A dramatic increase in the populations of these communities is reducing the availability of forest resources. In the absence of an integrated policy that recognizes traditional cultures, indigenous peoples could become part of a growing poverty statistic, as they begin to pay for resources they might otherwise have harvested freely from the forest.

Twenty-four of Venezuela's 28 indigenous groups live in the Guayana region. These groups make up 11.5 percent of the regional population and occupy and use 80 percent of the region (see Figure 6).¹⁶⁷ Some groups, such as the Yanomami and the Hoti, have lived in relative isolation until very recently. Many of Venezuela's Amerindians depend on forest resources for their survival. One study of the Piaroa indigenous people in Amazonas state concluded that communities received far more nutritional and economic benefit from the consumption of forest resources than they could possibly afford to purchase if they were to become low-skilled day laborers in the nearby capital of Amazonas state, Puerto Ayacucho.¹⁶⁸

Indigenous communities are not well protected under Venezuelan law. Because most indigenous peoples live in areas considered "unoccupied" or protected, they are vulnerable to having their lands opened for development projects, mining and timber concessions, and tourism lodges.¹⁶⁹ Furthermore, national government policies and access to urban markets have led some communities to become more sedentary and to undertake non-traditional activities, such as mining.¹⁷⁰ In addition, extractive activities and tourism on indigenous lands have had a noticeable impact on Venezuela's indigenous communities.

INDIGENOUS PEOPLES' POLICY

Article 77 of the Venezuelan constitution states that the nation is committed to bettering the lives of the rural population, with specific reference to "the protection of indigenous communities and their progressive incorporation into the Nation."¹⁷¹ The importance of this article is that it assigns special preference for indigenous communities (*regimen de excepción*) in the administration of their areas. Several other references to the rights of indigenous peoples exist in Venezuela's legal framework. Article 2 of the Agrarian Reform Law states that indigenous communities have a right to benefit from the land, forests, and water where they live.¹⁷² In addition, a Special Law creating the state of Amazonas in July 1992 stated that indigenous peoples' culture, languages, traditions, and lands were to be respected. The law also called on state officials to delimit indigenous lands "in accordance with their settlement patterns to award collective title to them."¹⁷³

Nonetheless, much of the legislation referring to Venezuela's indigenous peoples tends to focus on assimilating indigenous cultures into mainstream Venezuelan society, and progressive legislation recognizing indigenous land tenure patterns has not been implemented. On August 3, 1983, Venezuela passed legislation recognizing the International Labour Organisation's Convention 107 and establishing that indigenous peoples have the "right of ownership, collective or individual, of the members of the populations concerned over the lands which these populations traditionally occupy."¹⁷⁴ This legislation, however, established no mechanisms whereby it can be put into effect. In 1989, the ILO replaced Convention 107 with the more far-reaching Convention 169, but Venezuela has yet to ratify this new treaty.

In practice, implementing the limited legislation that exists regarding indigenous human and territorial rights has been difficult. Agrarian reform titles are generally not given out in protected areas, but 55 percent of Amazonas state is defined as falling into some category of protection. Consequently, indigenous peoples living in Venezuela are among the most unprotected in Latin America in terms of land rights. According to the 1992 census, over 70 percent of communities have no title whatsoever.¹⁷⁵ In comparison, Brazil recognizes land rights for over 60 percent of its indigenous groups.¹⁷⁶

In 1989, the Venezuelan Congress began debating a proposed Organic Law on Indigenous Communities, Peoples, and Cultures. After years of inaction, the bill was finally approved in the Senate in 1995 and is now being discussed in the Chamber of Deputies. Among other things, the bill seeks to consolidate and update the scant legislation on indigenous peoples' rights. It would also establish land rights and prohibit mining that displaces indigenous peoples from their ancestral land, although indigenous communities would be allowed to practice artisanal mining. While the bill clearly improves on existing legislation, indigenous groups have criticized it, primarily because they say they were not consulted.¹⁷⁷

TRADITIONAL USES OF FOREST RESOURCES

Nontimber forest products provide indigenous peoples of the Guayana region with materials for traditional medicines, food, and housing. Some of these products, such as honey and tropical fruits, are also sold in local markets. The Piaroa of Amazonas state sell wild palm fruits (*Euterpe precatoria*, *Jessenia bataua*, *Mauritia flexuosa*) in the market of Puerto Ayacucho, earning enough money to buy other household items. Consumption of edible nontimber forest products also provides important nutritional value for local indigenous peoples: wildlife hunting is an important source of protein,¹⁷⁸ and some wild palm

fruits provide more nutrition than comparable commercial products.¹⁷⁹ The Yanomami also depend on wildlife hunting and forest products for nutrition, and routinely travel in an 8-kilometer radius of their villages to hunt wildlife.¹⁸⁰ In addition to the collection of nontimber forest products, the Pemon of the western part of Canaima National Park are known to use about half of the timber species found in local forests.¹⁸¹

In some areas, however, the availability of these resources appears to be declining, especially in villages located near cities, such as Puerto Ayacucho and in the eastern portion of Canaima National Park. This is due in part to government policy, which has encouraged once seminomadic indigenous groups to settle in permanent villages. Such policies, coupled with an increase in access to better medical care, have stimulated a marked population increase in both Amazonas and Bolívar states.¹⁸²

The sedentarization of the region's indigenous peoples has increased the size of indigenous communities and reduced the sustainability of their traditional lifestyles, by putting pressure on the availability of wild foods for consumption by villagers. In one longitudinal study, Piaroa villagers reported traveling longer distances to collect wild foods than when their villages were smaller and closer to the forest.¹⁸³ In response, the Piaroa have begun to institute controls on individual hunting practices and have established quotas for consumption of meat within villages.¹⁸⁴ The Pemon now travel 40-50 kilometers in hunting forays that last 3-4 days and may take them into Guyana.¹⁸⁵ Communities have also begun to spend more time in cultivating activities rather than harvesting wild foods, and food shortages have contributed to malnutrition, particularly among the young and the elderly.¹⁸⁶ In fact, the size of forest clearings has increased in

communities where sedentarization was encouraged, and the population of these communities continues to increase rapidly as well.¹⁸⁷

Except for the wild fruits sold in local markets, few other non-timber forest products are sold at a national level. Some, such as palm leaves found in Amazonas (*E. precatoria*), are becoming popular as thatch roofing for trendy restaurants in Caracas and other large cities and resorts.¹⁸⁸ The palm heart (*Euterpe oleracea* and *E. precatoria*) industry has expanded recently, especially in the swamps of the Orinoco Delta. Indigenous groups in Amazonas use the chiqui-chiqui palm (*Leopoldinia piasaba*) for basketry and brooms, which they sell commercially.¹⁸⁹ In addition, oil from the *Jessenia bataua* is believed to cure respiratory problems and commands a high price in local markets.¹⁹⁰

If developed in a sustainable manner, some fruits with significant commercial value could not only contribute to national and international markets, but could also provide income for the region's indigenous peoples.¹⁹¹ Venezuela continues to import almost 90 percent of its vegetable oils, despite the fact that production of oil from palms, such as *Jessenia bataua*, could help satisfy some of this need.¹⁹² Forest products from Amazonia have been successfully marketed internationally. For example, in 1986, the value of Brazil nuts exported from Manaus reached almost \$6 million, much of which went to satisfy an international market.¹⁹³ In Venezuela, one promising experience is the manufacture of perfume from the tonka bean (*Dipteryx odorata*), which is currently being sold in France.¹⁹⁴

TOURISM IN INDIGENOUS COMMUNITIES

Mining and logging are not the only development activities imposing on indigenous groups. Tourist agencies operating in national parks and natural monuments have also met with resistance from local indigenous communities. According to the Tourism Law, indigenous communities must be consulted before any tourism projects are initiated.¹⁹⁵ In reality, indigenous communities complain that they are not consulted before tourist activity commences in their territories. In Bolivar state, 40 Pemon communities took action against a proposed tourism encampment in Canaima National Park, eventually blocking the plan on the grounds that it would lead to invasion of their lands and degradation of the environment.¹⁹⁶ Likewise, the Piaroa of Amazonas state also succeeded in blocking tourism development in their territories (see Box 12).

12

CONTROLLING THE IMPACTS OF TOURISM ON INDIGENOUS TERRITORY

The Piaroa of Sipapo, in northern Amazonas state, have fought against the negative impact of tourism on their territory for more than ten years. While tourism in indigenous communities is illegal without the community's prior consent, agencies have brought tourists to fish and camp on lands used by the Piaroa. The Piaroa complained of loss of privacy, decreasing fish stocks, and desecration of their sacred sites.

In January 1996, a group of Piaroa women and children detained tourists entering community lands, confiscating fishing and camping equipment. Members of the Piaroa community then took their case to court, and in June the judge ruled in their favor, establishing, among other things, the following rules for tourism on Piaroa territory:

- No tourists are allowed on Piaroa lands without prior consent of the community Counsel of Elders.
- Tourist guides should be Piaroa and must operate with consent of Piaroa authorities.
- State and federal officials do not have the authority to grant tourism permits on Piaroa land.

While the above regulations were already established according to the Tourism Law, the ruling in this case not only confirmed the law, but also established an important precedent for future cases involving tourism on indigenous lands.

Source: PROVEA. Situación de los Derechos Humanos en Venezuela. informe anual (PROVEA: Caracas, October 1995-September 1996), pp. 218-219

IV. WHO BENEFITS FROM ECONOMIC ACTIVITIES IN FORESTS?

SECTION HIGHLIGHTS:

- Logging is not economically viable in the Guayana region, and royalties on timber extraction represent only 3 percent of the value of timber production.
- Small-scale miners produce an estimated \$50 million to \$100 million worth of gold annually, none of which is taxed by the government.
- Government plans to favor multinational mining companies are not likely to employ all of the region's small-scale miners, and logging is not likely to contribute to local employment in a meaningful way.
- Only 10-15 percent of the park service's budget comes from revenue-generating activities.

The Venezuelan government imposes a variety of royalties and taxes on forestry and mining activities. Yet, because of government subsidies and a rapidly devaluating currency, the value of these activities is not fully captured at the local or national level, especially in the case of forestry (see section highlights box).

4.1 ROYALTIES AND FEES IN THE FORESTRY SECTOR

The government collects revenue from logging through royalties and area fees. Income taxes vary according to the concessionaire's contract. During the 1970s, royalties and area fees totaled approximately US\$16 per cubic meter, but as the fees were not set to change with inflation, by the early 1990s these fees had eroded to less than US\$2 per cubic meter.¹⁹⁷

In May 1994, a new fiscal law was approved by Congress, which updated the fees paid by timber concessionaires for "technical services." These services were generally defined as inspection, paperwork, evaluation, and supervision by members of the Forest Service. Technical service fees were set at \$4.80 per cubic meter for the extraction of the most valuable species, and \$2.70 per cubic meter for secondary species.¹⁹⁸ With the devaluation of the *bolivar*, these fees are currently \$1.83 per cubic meter for primary species and \$1.04 per cubic meter for secondary species. Area fees remain very low at \$0.02 per hectare per year for the area that will be harvested during the year. As of November 1997, timber concessionaires also pay an average of \$2.34 per cubic meter as an additional extraction tax. The total of all royalties and administrative fees account for only 3 percent of the value of timber production, and this share will diminish over time as these fees lose value because of inflation.¹⁹⁹ Compared to other tropical countries, Venezuela's logging fees are low (see Figure 9).

According to the government, royalties on the cubic meter of wood produced are calculated based on an "official" measurement of the cubic meter, which is two thirds of an actual cubic meter.²⁰⁰ Thus, one-third of each cubic meter is not taxed, which amounts to an average yearly subsidy of over \$23,000 per concessionaire, or approximately \$181,000 in the Inataca Forest Reserve alone. This subsidy is estimated to have cost the Venezuelan government approximately \$75 million in the last ten years.²⁰¹ Payments accrue directly to the national treasury, rather than to the Forest Service.²⁰²

According to a recent study, the amount of revenue earned from logging is so low that the Forest Service relies on the central treasury to provide enough funds to cover the costs of its operations.²⁰³

Employment by timber concessionaires can provide significant benefit for local populations. Most of the jobs, however, are seasonal and low-paying. Mining is the main base for employment in the Guayana region, and the benefits accrued locally from work in the forest sector are minimal.²⁰⁴

Thus, few of the communities bordering timber concessions benefit from the forest sector. The industry's failure to incorporate local communities in its operations has contributed to a lack of support for forest reserves.²⁰⁵

4.2 ROYALTIES AND FEES IN THE MINING SECTOR

Gold and diamond mining provide greater revenue for the government and require greater capital and labor investments than timber extraction. The Venezuelan government applies a 34 percent income tax rate to net income from mining companies and a 1 percent royalty on unrefined gold and diamonds. Venezuela's income tax, which was recently lowered from 60 percent, is similar to that charged by other mineral-rich countries.²⁰⁶

Mining companies are charged a \$0.002 per hectare area fee. During the exploration phase, mining companies are exempt from paying value-added taxes on imported equipment and are granted duty-free imports of specialized equipment during the life of the project. The government has also sought to attract mining investments by allowing mining companies to sell up to 85 percent



Mining is the main base for employment in the Guayana region, and the benefits accrued locally from work in the forest sector are minimal.

of their gold freely, as opposed to selling exclusively to the Central Bank with payment in local currency. Companies are allowed a tax credit of 15 percent of profits to account for depreciation in the early years of a mine's operation. The Las Cristinas concession, 70 percent of which is owned by Placer Dome, will earn an average of \$84 million per year before income taxes. From a large mine like Las Cristinas, the government will earn approximately \$29 million each year (see Table 7). Revenue from these taxes goes directly to the national treasury, although the regional Corporación Venezolana de Guayana will earn approximately \$17 million after taxes from the Las Cristinas concession. Placer Dome will take home approximately \$38 million per year.

Mining operations are generally more labor-intensive than forestry; the construction phase at Placer Dome's Las Cristinas mine will employ 3,500 people. Thereafter, a maximum of 900 people will be required to operate the mine.²⁰⁷ Currently, very few people are employed in the formal mining sector, since there are few operating mines. At



Even if multinational companies increase employment in industrial mines, they are unlikely to absorb the large contingency of local miners who risk being displaced by their arrival.

least 30,000 additional miners are operating illegally as *garimpeiros*, although these operations are not regulated or taxed. Generally, small-scale miners do not own exploration and processing equipment, such as milling equipment.

After gathering gold-bearing material, the small-scale miner takes it to a mill for processing and is charged 17-20 percent of the gold. Another 25 percent is paid to the owner of equipment used in operations, with the remaining portion accruing to the miner. On average, small-scale miners can obtain 3.5 grams of gold (worth approximately \$43.75) for every 50 kilograms of material excavated.²⁰⁸ Still, at this rate, small-scale miners can greatly exceed the minimum salary of approximately \$150 per month for unskilled wage labor. Small-scale gold production, all of which is illegal, reaches between 5 and 10 tons per year.²⁰⁹ At current international prices, the value of production by small-scale gold miners is between \$50 million and \$100 million annually. None of that amount goes to the national treasury.

FIGURE 9

Average Royalties for Logging in Forest Countries

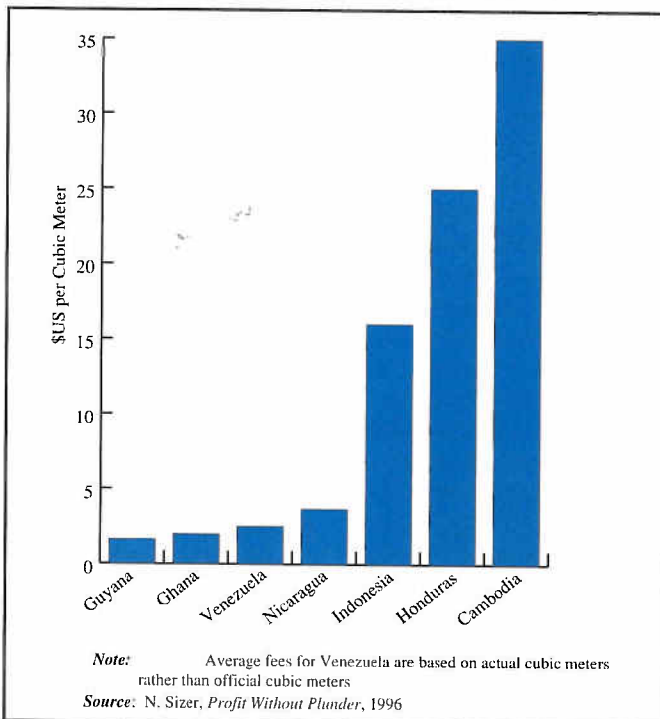


TABLE 7

What will the Government Earn from Mining in the Guayana Region? ¹

	LAS CRISTINAS GOLD MINE ²
Length of concession contract	20 years
Size of concession	4,000 hectares
Capital investment	\$600 million
Average total production	11.8 million ounces of gold 720 million pounds of copper
Average yearly production	450,000 ounces of gold 36 million pounds of copper
Yearly revenue (value of production)	\$191.7 million
Yearly operating costs	\$92.3 million
Royalties	\$1.9 million
Depreciation	\$15 million
Average yearly net income before taxes	\$84.4 million
Income tax	\$28.7 million
Taxes and royalties as a percentage of yearly revenue	16%

¹ The following assumptions were included in this analysis: a. Exchange rate: 1 US\$= 500 bolivares b. Average market price of gold: \$350 per ounce c. Average market price of copper: \$.95 per pound d. Production (operating) costs were \$205/ ounce (includes royalties) e. In Venezuela, mining companies are allowed to deduct 15% of income before taxes to allow for depreciation. This deduction is calculated for the early years of the mine. Depreciation was estimated using the following formula: Depreciation= .15 x (income - operating costs) f. Net income = total yearly production value - depreciation - operating costs - royalties

² Joint Venture: Placer Dome=70%; CVG= 30%

Source: Placer Dome, 1997

Even if multinational companies increase employment in industrial mines, they are unlikely to absorb the large contingency of local miners who risk being displaced by their arrival. Indeed, preliminary estimates in the region suggest that industrial mining employs fewer people per hectare than small-scale mining.²¹⁰ In addition, these independent miners may not be open to working for multinational companies at all, considering recent conflicts between the two parties in the region.²¹¹ Assuming a generous multiplier effect of 5 indirect jobs per mining job created, nearly 7 new mines on the scale of Las Cristinas would have to be developed to absorb the region's small-scale mining population.²¹² Such extensive development is not likely, given that deposits on the order of Las Cristinas are thought to be rare.²¹³

4.3 ROYALTIES AND FEES IN NATIONAL PARKS AND NATURAL MONUMENTS

Of all the parks and natural monuments in Bolívar and Amazonas, only Canaima National Park charges entrance fees to visitors. Revenues from entrance fees and concession contracts contribute only 10-15 percent of operating costs.²¹⁴ According to park policy, visitors to the western portion of Canaima pay \$4.15 each, and in the eastern portion visitors pay approximately \$1.00 per vehicle or \$2.00 per visitor entering on foot.²¹⁵ In contrast, visitors to one of Venezuela's internationally known marine parks, Archipelago Los Roques, pay \$2.00 for nationals and \$10 for foreigners.²¹⁶ Concessions are normally given to airlines, lodges, and tourist guides to operate within park boundaries, but they are granted as a result of private agreements between INPARQUES and the company in question, rather than through an open bidding process, and there are no fixed fees or royalties.

Visitor- and user fees can provide significant revenue for conservation activities within national parks. The Saba Marine Park in the Netherlands Antilles has raised revenues from visitor entrance fees, user fees levied on divers, souvenir sales, and donations. In 1991, the park raised 81 percent of its budget through a combination of these activities.²¹⁷ Surveys also suggest that visitors are willing to pay significantly more in fees when they are aware that their contribution will help fund the parks.²¹⁸ While studies of visitors' willingness to pay are generally hypothetical, evidence suggests that they do indeed pay more for unique natural experiences. For example, in 1987, the privately run Monteverde Cloud Preserve in Costa Rica was charging entrance fees of \$2.75, four times greater than the \$0.65 fee charged at national parks.²¹⁹ Despite its higher fees, the reserve's visitation days more than tripled between 1980 and 1985.²²⁰

Currently, only Archipelago de Los Roques differentiates its



Visitor- and user fees can provide significant revenue for conservation activities within national parks.

fees to distinguish between national and foreign visitors. Because Canaima is at least as popular as Archipelago de Los Roques, it stands to reason that foreigners would be willing to pay similar fees, especially since getting to Canaima is more costly than going to Los Roques.²²¹ A survey conducted in two of Venezuela's most well-known marine parks indicated that Venezuelans would be willing to pay \$3.35 per visitor, an increase of \$2.10 over what they are currently charged. Other options for capturing revenue also exist (see Box 13).²²²

13

CAPTURING BENEFITS FROM VENEZUELA'S NATIONAL PARKS

Although Venezuelans are conscious of the value of their national parks, few benefits from user- or entrance fees are captured. For example, in 1996, the annual operational budget for the eastern sector of Canaima was \$1,171, not including money allocated for personnel. Besides raising park fees, Venezuela has several options to generate additional revenue from the use of its parks:

- **RE-EVALUATE FEES PAID ON WATER AND ELECTRICITY.** Protection of watersheds is an

important function of Venezuela's parks. The government could apply a portion of fees charged on water, irrigation, and hydro-electric utilities to national park management.

- **STANDARDIZE ROYALTIES FOR TOURIST AGENCIES AND OTHER CONCESSIONAIRES OPERATING WITHIN PARK BOUNDARIES.** Concessions could be opened to public bidding, and fees generated from concession agreements could be applied to park management.

- **CHARGE VISITORS FOR SIDE SERVICES.** Such services include guided tours, providing information about the park, or selling souvenirs.

- **SEEK CONTRIBUTIONS FROM PRIVATE CORPORATIONS.** National and international companies operating in Venezuela could be given a modest tax credit for contributing to park management.

- **LAUNCH A PUBLIC INFORMATION CAMPAIGN.** Through television and newspapers, an information and education campaign could raise consciousness on the

importance of protecting national parks.

Sources: C.J. Sharpe and I. Rodriguez, "Discovering the Lost World: Canaima National Park and World Heritage Site, Venezuela," George Wright Forum (Vol 14, 1997), pp. 15-23; L. Antillano, "Evaluación de la Gestión del Ministerio del Ambiente y de los Recursos Naturales Renovables en Materia Ambiental y de Ordenación Territorial," report for Seriate Environment Commission (Caracas, 1995).

V. MAJOR FINDINGS: RISKS AND BENEFITS FOR VENEZUELA'S FRONTIER FORESTS

The forests of Venezuela's Guayana region are rich in biodiversity, hydroelectric potential, capacity to protect drinking water and store carbon; they are a home for many of the nation's indigenous peoples. For these reasons, economic development in this ecologically and socially sensitive region must be undertaken with great care and in full consideration of the potential risks for the environment as well as the potential benefit to local communities. Our analysis leads to three principal findings:

1. *The benefits from logging and mining are not being fully captured at the national or local levels.*

Until now, the government has not benefitted much from either logging or mining in the Guayana region. Logging subsidies and low royalties mean that little revenue accrues to the national treasury from timber extraction, and local communities benefit very little from any employment in the forestry sector. Currently, logging contributes only 3 percent of revenues through royalties and area fees, and one third of the timber extracted is not taxed.

The government has lost revenue by failing to tax between \$50 million and \$100 million worth of gold from small-scale mining, although such operations do provide work for approximately 30,000 miners. Even national parks and monuments can help generate funding for conservation activities, but in the few parks where fees are collected the revenue is not sufficient to contribute significantly to conservation activities. Furthermore, any revenues derived from the development of forest resources accrue directly to the national treasury and are not directly re-invested in the conservation of these resources.

2. *Logging and mining currently cause considerable negative environmental and social impacts in the Guayana region.*

Both mining and logging in the Guayana region have taken a toll on the forests and the people living in them. A combination of logging practices and squatter settlements has damaged an estimated 2 million hectares of public forest lands in Venezuela, more than half of the 3.5 million hectares held in timber concessions, independent of any damage created by small-scale gold mining.

Gold mining has been undertaken almost entirely by small-scale miners, whose use of mercury and environmentally destructive machinery has significantly increased sedimentation in the region's main water courses, contamination of fish, and destruction of habitats. By 1991, mining in the region had increased the sediment load of the Caroni River by a factor of ten. In addition, both small-scale miners and at least one foreign company have come into conflict with indigenous communities.

Much of the environmental damage is potentially avoidable, but the Venezuelan government, particularly the Ministry of Environment, lacks adequate capacity to implement regulations and monitor forest activities. The Ministry has 3 technical forestry personnel to patrol nearly 3 million hectares under concession in the Guayana region alone and only one inspector for the mining concessions. The Ministry of Mines has equally limited personnel and resources to monitor its mining contracts in the region. Furthermore, the government agencies generally do not coordinate efforts to conserve forest resources and sometimes subordinate long-term conservation priorities.

In addition, the government has not developed its current plans for the region in a participatory manner. Sometimes information about development activities has been closely guarded, divulged only at the last minute in a hasty public consultation, as was done in the case of the Imataca Zoning Plan. Similarly, in the development of the Guri electrical transmission line, which is now in its construction phase, indigenous communities affected by the project were not consulted and the environmental impact assessment was not made public.

3. *Expansion of logging and mining activity is likely to bring fewer benefits and higher environmental and social costs than expected.*

Economic growth is critical to Venezuela's future development, but unwise use of the nation's forest resources will only yield growth at significant costs. Clearly, mining will generate higher revenues for the treasury than logging, but mining is inherently unsustainable. While large-scale mining will provide some jobs for small-scale miners, it will not be able to absorb all of the region's miners. And assuming that large-scale mining does bring an economic boom for the region, these benefits and economic growth will be short-lived because the mines will close in 20-40 years.

One government response is to foster the development of cooperatives among small-scale miners, which would facilitate the legalization of operations. The government also plans to create a Superintendency of Mines, which would oversee both small-scale and industrial miners. Unless the superintendency has significant regulatory capacity, however, the government would still be unable to monitor and regulate the environmental impact of these activities.

So far, the mining industry has taken the lead in developing standards for mining in Venezuela, an effort that is being coordinated by the Venezuelan-American Chamber of Commerce. Although innovative standards and guidelines for gold mining are necessary tools for protecting the environment, they will be ineffective without provisions in place for implementation. Indeed, Venezuela already has some far-reaching legislation that recognizes the need to protect watersheds and forest resources, but mining activity in the region is in breach of existing regulations. Lacking the administrative capacity to implement clear regulations on

mining and the financial leverage to demand adequate guarantees on the companies' performance, Venezuela risks additional environmental damage. No matter the size of the operation, mining companies should not be relied upon to monitor the environmental impacts from their activities voluntarily. Instead, before it contemplates an increase in activity, the government must use regulations, oversight, and adequate performance bonds to control the negative environmental and social impacts of extractive activity that already exists in the region.

VI. MAJOR RECOMMENDATIONS: ALTERNATIVES FOR SUSTAINABLY MANAGING THE GUAYANA REGION

Developing sound, long-term forest policies for the region in the face of so many conflicting economic, social, and political interests is, at best, a difficult task. The following three priority recommendations, however, could help Venezuela to achieve a better balance between conservation and economic development.

1. *Capture fully revenue from forest resources and ensure that benefits contribute to long-term forest conservation.*

OPTIONS FOR POLICY-MAKERS

Currently, benefits from forest resources are not fully captured at either the national or local levels. Priority recommendations for policy-makers are:

- *Remove subsidies on timber extraction and use this money to re-invest in conservation and monitoring activities.* Subsidies now offered to logging concessionaires are not justified, in light of the environmental impact of their activities.

- *Seek means of capturing more revenue from national parks, such as increasing entrance fees, setting fees for side services, and ensuring that fees paid on water services reflect the cost of managing the watershed.* While raising park fees is generally unpopular, a combination of gradually increased entrance and ecosystem service fees could generate more revenue to pay for park management (see Box 13). Ensuring that water prices reflect the cost of managing watersheds could help generate funds for conservation of the Guayana region, especially as much of the region's urban water and the nation's hydroelectric power are protected by forests in Bolívar and Amazonas states. In addition, tax revenues can be redirected to fund conservation in areas where the protection of resources is beneficial for maintaining specific ecosystem services. For example, the Brazilian state of Paraná redirects 5 percent of its sales tax to fund watershed conservation activities in communities located in upstream catchments. In 1996, \$19 million was raised in this manner and redirected to 150 municipalities.²²³

- *Establish an open auction system for mining and logging concessions, in which the concession is granted to the highest bidder.*

Additional considerations could include favoring companies that show plans to use technologies which reduce environmental impacts, or that provide data for monitoring their performance. Public auctions could generate multiple bidders for mining and logging concessions and could help provide the highest price for the resource in question. A base fee for the resource would be established to avoid collusion among bidders. A similar process was recently instituted in Cameroon with support from the IMF and World Bank, where French and Asian companies have concluded a bidding process on the country's valuable timber concessions.²²⁴

- *Examine opportunities for formulating a carbon sequestration package under the Clean Development Mechanism of the Kyoto Protocol, which could include reduced-impact logging techniques or other forest conservation measures.* Under this type of arrangement, an emitter in a developed country can agree to fund forestry and land-use projects in developing countries that contribute to reductions in global greenhouse gases. While such projects have been voluntarily implemented by specific companies in developed countries, they may now take on a larger role through the Kyoto Protocol, which was designed to slow global warming.²²⁵

OPTIONS FOR LENDERS AND DEVELOPMENT AGENCIES

Lenders, such as the IMF and World Bank, can help orient the government's efforts in evaluating methods of capturing lost revenue, before the government begins to expand extractive activity. Lenders and development agencies could:

- *Consult with the Venezuelan government on methods of capturing lost rent on tourism and existing mining activities before advocating the expansion of mining and logging activity.*

- *Help the Venezuelan government to establish and implement an open auction system for awarding logging and mining concessions.*

- *Support innovative compensation and tax-based systems for financing conservation.*

2. Minimize the environmental and social impacts of mining and logging.

OPTIONS FOR POLICY-MAKERS

Before escalating mining and logging activity, the government should first attempt to control the activities already underway. Options policy-makers should consider are:

■ *Enact a moratorium on future mining and logging contracts until there are a) a clear policy on environmentally responsible mining, b) reclamation standards for both small- and large-scale mining, and c) a comprehensive review of forestry policies.* New standards for logging practices could take into consideration international standards, such as those developed by the Forest Stewardship Council, the United Nation's Food and Agriculture Organization, and the United States Forest Service. With the participation of local researchers and universities, the Venezuelan Forest Service could undertake a systematic analysis of the impact of logging in forest reserves. The goal of such an exercise would be to develop a forest management system specifically for the Guayana region, which would then be re-evaluated on a regular basis for continual monitoring of environmental and social impacts.

■ *Remove perverse incentives for forest conversion, especially in the agricultural sector.*

Agrarian reform policies should be re-evaluated and revised to eliminate perverse incentives that stimulate forest conversion to farmland and encroachment in public forest lands.

■ *Coordinate the collection of necessary baseline data before expanding mining and logging activities and make this information available through a national information bank.* To maintain the greatest degree of objectivity, these data would be collected independently, preferably through local universities and other research institutions. The national information bank would be public and would contain government policy documents, scientific studies, and post-graduate dissertations relating to extractive activities in the region.

■ *Establish an "early warning" continuous monitoring and information system to track environmental and social impacts from extractive activities.* Such a system would be open and readily accessible to those outside government and would consist of technically sound, objective information gathered on a continual basis, to allow officials to adapt policies based on realities observed in the field.²²⁶

■ *Require that companies provide a performance bond equal to 10 percent of their investment, to guard against potential environmental impacts.* Companies could be required to post a bond sufficient to cover not only the costs of reclamation, but those related to cleaning up accidental spills or long-term treatment of groundwater. To avoid underestimates by the companies, the environmental impact could be assessed by an independent expert, who would advise the government on estimating the costs of potential impacts. The bond would be held in an interest bearing account and only released after the life of the project, or in the case of mining, a number of years after the mine had closed.

■ *Increase the capacity of the Ministry of Environment to implement environmental regulations and commit to making 25 percent of civil service slots tenured positions for each of the next four administrations.* Since policy-makers are currently under pressure to decrease the size of the public sector, adding new staff and resources at the central level may not be entirely feasible. Currently, many of Venezuela's government officials are concentrated in Caracas, and there appear to be few links between the field and many central offices.

One way to address this issue, as well as the lack of institutional stability, would be to create career civil servants at high levels of administration, especially for conservation and environmental offices. Once tenured, incumbents would have to refrain from participating in political activity, and positions would be filled competitively once vacant. Promotions would be based on performance, ensuring that a dedicated cadre of civil servants would monitor the environment. Additional incentives could be offered to those civil servants willing to work in remote places, and such individuals could eventually be integrated into central offices.

OPTIONS FOR LENDERS AND DEVELOPMENT AGENCIES

Lenders and development agencies can also assist policy-makers by directing funds to the following:

- *Fund institutional capacity development, focussing especially on amplifying the presence of government officials in the field.* The World Bank or the Global Environment Facility, for example, might provide seed money for data collection or training.

- *Ensure that strong environmental policies are in place when instituting structural adjustment reform.* Structural adjustment packages could include more active measures to ensure that environmental policy is strengthened at the same time that macroeconomic reforms are instituted.

OPTIONS FOR NGOS AND RESEARCHERS

Non-governmental organizations, universities, and researchers can also perform a significant role in helping to:

- *Develop a database for monitoring environmental and social impacts, including information regarding extractive activity in the Guayana region, and records of international mining companies.* For example, such groups could be involved in researching the impacts of logging and mining on indigenous communities, or tracking the past environmental and social records of international mining companies. Such oversight has not been institutionalized in many places, but for example, NGOs have been monitoring the activities of multinational petroleum companies in Ecuador throughout the last decade.²²⁷

OPTIONS FOR THE PRIVATE SECTOR

Businesses could implement the following steps:

- *Collaborate with monitoring activities and help collect baseline data during the early stages of exploration.* A percentage of revenue generated by extractive activities, for example, could fund continued data collection.
- *Take immediate steps to adopt best practices for mining and logging.* These include reducing the impact of logging techniques and heavy equipment, as well as carefully planning road-building. Similarly, in the case of mining, when operating in an area of former small-scale activity, companies can recover mercury spilled by small-scale miners and take steps to recover damaged ecosystems.

3. Consider new arrangements for forest resource use based on public participation.

OPTIONS FOR POLICY-MAKERS

Some alternatives for policy-makers in defining a future for the Guayana region would be to:

- *Conduct long-term land-use planning, and incorporate the needs and desires of traditional communities in developing national economic plans.*

Ideally, the land-use plan is a vision for sustainable development and natural resource conservation in the region, developed with the participation of local stakeholders. Recognition of basic human rights, such as the right to land, can be part of ensuring sustainable use of forest resources. Furthermore, involving indigenous peoples in planning and land-use management is often critical to creating local support for conservation activities, particularly in national parks and other protected areas.

As part of a land-use plan, policy-makers should consider a range of development options that would benefit local stakeholders, such as evaluating the alternatives for marketing non-timber forest products collected in a sustainable manner by indigenous communities. Extractive reserves have been established in Brazil and Colombia with the objective of providing local communities with a livelihood from the marketing of non-timber forest products. While not a panacea, such initiatives could provide a basis for establishing a sustainable, multiple use framework for ensuring the well being of local communities.²²⁸

- *Demarcate indigenous territories, in consultation with the communities.* Projects to map ancestral lands are already being carried out in Guyana, Suriname, and Venezuela.²²⁹ In addition, the government should consider ratifying the International Labour Organisation's Convention 169 on indigenous peoples' rights, which updates Convention 107.

- *Manage forest resources at a landscape level by considering co-management arrangements with indigenous communities and NGOs, as well as integrating environmental planning and management across government agencies.* Such co-management agreements have been successful in Australia's Kakadu National Park, for example, and have the added benefit of providing monitoring and enforcement in remote parks where encroachment currently poses a significant threat.²³⁰

Managing the Guayana region for a more sustainable future will also require a more collaborative approach between ministries. One way to accomplish this would be to manage forest resources more clearly on ecosystem characteristics, rather than jurisdictional boundaries. For example, if protecting the Caroni watershed is established as a priority, then a regional coordinating body could be developed which might include representatives from local communities, the Park Service, the CVG, NGOs, scientists, and other stakeholders.²³¹ Forest reserves could also be managed collaboratively with the Park Service to improve connectivity between protected forest areas. Managing resources at the ecosystem level is being applied globally, including in the United States.²³²

- *Involve NGOs, indigenous and local communities, local governments, and other interest groups in the development of land-use plans by publicly disclosing them and instituting immediate consultative processes, before any further work on these projects is carried out.* In a democratic country, such as Venezuela, considerable importance is assigned to open, participatory processes that include local communities, NGOs, and the private sector. Naturally, consultation is a lengthy process. However, as has been the case with the Imataca Forest Reserve, absent such measures, implementation of key government plans can be further delayed by lawsuits, protests, or blockades by local inhabitants. Increased participatory processes and transparency were a key recommendation of the recent U.S. Forest Service mission to the Imataca Forest Reserve.²³³

OPTIONS FOR LENDERS AND DEVELOPMENT AGENCIES

These organizations can assist government efforts by considering the following alternatives:

■ *Encourage the Venezuelan government to demarcate the territories of indigenous peoples, to maintain the decrees banning logging and mining in Amazonas, and to assist the government in the management of protected areas.* The European Union, which partially funds the Orinoco-Casiquiare Biosphere Reserve, could continue its funding based on the development and implementation of a national land-use plan that contemplates how forest resources will be used in Amazonas state.

■ *Fund training for government officials at a local level to undertake responsibility for managing forest resources.* The World Bank's INPARQUES project could seek to devote more funding to the development of human resources by providing more intensive training for park managers working with indigenous communities. Furthermore, the World Bank's Environmental Management Project might be extended to the Guayana region. The project now focusses on the re-organization of the Ministry of Environment by decentralizing its responsibilities, and by shifting personnel to the field. However, these activities are limited to two states outside of the Guayana region. One important caveat should be kept in mind, however. Attempts to decentralize should not amount to a mere abdication of responsibility at the central government level. An important role would still exist at the central level in the definition of broader national forest policies and ensuring compliance in the field.²³⁴

OPTIONS FOR NGOS AND RESEARCHERS

For NGOs, universities, and researchers, the following alternatives should be considered:

■ *Expand collaboration with government agencies in co-management agreements for selected protected areas.* For example, the Park Service currently has a collaborative agreement with some NGOs. Such collaboration would help maximize expertise, provide necessary training for government officials, and provide new solutions to sustainably managing the Guayana region's forests.

■ *Help train local government officials to undertake responsibility for managing forest resources.* Local and regional governments will likely need additional training and capacity building to take on new responsibilities formerly allotted to central government agencies, especially in terms of understanding how healthy forest ecosystems help maintain valuable water resources. Such training could be provided by NGOs or funded by lenders and development agencies.

OPTIONS FOR THE PRIVATE SECTOR

For mining and logging companies, the goal should be to:

■ *Respect ancestral indigenous lands even if these are not officially recognized.* Private companies operating in the region can help motivate the government to recognize the importance of land demarcation, as unclear land tenure provides a security risk for companies wishing to invest in extractive activities. In the forest reserves of the western Llanos, concessionaires have already lost timber in areas where they operate because of invasions by peasants seeking land.

■ *Contribute to the development of nearby communities by establishing development plans for indigenous communities and other local groups in consultation with local stakeholders.* Companies with a vested interest in the region can help ensure that communities benefit from their presence. The degree to which local communities accept the presence of mining and logging companies, especially foreign multinationals, is important to the success of the venture. Thus, mining and logging companies should be prepared to contribute to the development of residents, especially in terms of ensuring a long-term sustainable future.

NOTES

- 1 Frontier forests are defined as "large, ecologically intact, and relatively undisturbed natural forests." See D. Bryant et al. *The Last Frontier Forests: Ecosystems and Economies on the Edge* (World Resources Institute: Washington, DC, 1997), p. 6.
- 2 D. Bryant et al., *The Last Frontier Forests: Ecosystems and Economies on the Edge*. (World Resources Institute: Washington, DC, 1997).
- 3 D. Bryant et al. *The Last Frontier Forests: Ecosystems and Economies on the Edge*. (World Resources Institute: Washington, DC, 1997), p. 25.
- 4 World Resources Institute, *World Resources Report 1996-97* (World Resources Institute: Washington, DC, 1997).
- 5 IUCN, "1996 Global Protected Areas Summary Statistics" (World Conservation Monitoring Centre Internet site: <http://www.wcmc.org.uk>, May 1997).
- 6 "Strictly protected" in this case means all areas protected under IUCN categories I-III, which signifies that these areas are closed to extractive activity. Such areas can include national parks, natural monuments, and nature reserves. See World Resources Institute, *World Resources 1996-97* (World Resources Institute: Washington, DC, 1997), pp. 262, 270.
- 7 SOCSAL, Venezuela: Realidad Nacional (Caracas, 1995).
- 8 International Monetary Fund, *International Financial Statistics* (Washington DC, March 1997). Inter-American Development Bank, *Pocket Profiles* (Washington, DC, 1996).
- 9 CORDIPLAN (Oficina Central de Coordinación y Planificación de la Presidencia de la República). Un proyecto de país: Venezuela en consenso (GOV, 1995).
- 10 Evidence suggests that deforestation can lead to decreased water levels and, by extension, a decrease in the hydroelectric potential of a watershed. For more detail, see N. Myers, "The World's Forests and Their Ecosystem Services" in G.C. Daily (ed.), *Nature's Services: Societal Dependence on Natural Ecosystems* (Island Press: Washington, DC, 1997), p. 218.
- 11 W. Cruz and R. Repetto, *The Environmental Effects of Stabilization and Structural Adjustment Programs: The Philippines Case* (World Resources Institute: Washington, DC, 1992).
- 12 A. Romero Dias, "Economic Contributions of Venezuelan Protected Areas: The Tragedy of the Commons and Perspectives" in M. Munasinghe and J. McNeely (eds.), *Protected Area Economics and Policy: Linking Conservation and Sustainable Development* (World Bank and World Conservation Union-IUCN: Washington, DC, 1994), p. 122.
- 13 See GOV, "Decreto 2552: Mediante el cual quedan prohibidas las talas, deforestaciones y explotaciones de productos forestales madereros en todo el territorio federal Amazonas" (Gaceta Oficial no. 31,408: Caracas, 6/19/78); GOV, "Decreto 269: Mediante el cual se prohíbe la explotación minera dentro del territorio federal Amazonas y se ordena la suspensión inmediata de cualquier actividad minera en ejecución" (Gaceta Oficial No. 4,106 Extraordinario: Caracas, 6/9/89); GOV, "Ley Forestal de Suelos y de Aguas" (Gaceta Oficial No. 1004 Extraordinaria: Caracas, 1/26/66); GOV, "Decreto 1742: Mediante el cual se dicta el marco general para la normalización de la actividad de exploración, desarrollo y explotación de oro y de diamantes en la cuenca hidrográfica del Alto Caroní" (Gaceta Oficial No. 34,783: Caracas, 8/23/91).
- 14 GOV "Decreto 1137: Por el cual se declara Parque Nacional con el nombre de 'Canaima', la región de la Guayana venezolana, ubicada en jurisdicción de los Distritos Piar y Roscio del Estado Bolívar" (Gaceta Oficial No. 38,809: Caracas, 10/1/75).
- 15 GOV, "Decreto 1738: Eliminación de Minería Degradante en el Estado Bolívar" (Gaceta Oficial No. 34,744: Caracas, 7/25/91).
- 16 GOV, "Decreto 1742" (Gaceta Oficial No. 34,783: Caracas, 8/23/91).
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- 33 Before the Organic Land Use Zoning Law of 1983 all forest reserves were established by resolution. Many still remain created under ministerial resolution rather than presidential decree.
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- 49 For example, see N. Sizer and R. Rice, *Backs to the Wall in Suriname: Forest Policy in a Country in Crisis* (World Resource Institute: Washington, DC, 1995); N. Sizer, *Profit Without Plunder: Reaping Revenue from Guyana's Tropical Forests Without Destroying Them* (World Resources Institute: Washington, DC, 1996).
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- 62 World Bank, "Venezuela Land Markets, Land Reform and Rural Land Ownership," Country Department I: Environment and Agriculture Operations Division, Latin America and the Caribbean Region, report no. 10419-VE, 1993, p. 19.
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- 64** A. Romero Dias, "Economic Contributions of Venezuelan Protected Areas: The Tragedy of the Commons and Perspectives" in M. Munasinghe and J. McNeely (eds.), *Protected Area Economics and Policy: Linking Conservation and Sustainable Development* (World Bank and World Conservation Union-IUCN: Washington, DC, 1994); L. Hernández et al., "Una visión sobre el manejo forestal en la Guayana venezolana (Estado Bolívar)," report prepared for the Regional Commission on Environment, Mining and Zoning in Bolívar state, 1994; J.C. Centeno, "Estrategia para el desarrollo forestal de Venezuela," unpublished paper, 1995.
- 65** D. Díaz Martín, "Expansión de la frontera agrícola y deforestación en Venezuela," paper presented at the 5th International Meeting of the Latin American Forest Network, 10-13 July 1994, Quito, Ecuador.
- 66** Government of Delta Amacuro state, "Gaceta oficial del estado Delta Amacuro" no. 017 extraordinario (Tucupita, Venezuela: 15 December, 1996).
- 67** All of the forest reserves and woodland lots north of the Orinoco can be characterized as degraded from either agricultural encroachment or the effects of forest management practices. See C.J. Sharpe et al., "The Effects of Structural Adjustment on the Venezuelan Environment as Illustrated by Trends in Basic Environmental Indicators," a contribution to the WWF-International/ HIID Project: Structural Adjustment and the Environment (CENDES/UCV: Caracas, 1994). South of the Orinoco, the San Francisco woodland lot has been nearly completely deforested. See J.C. Centeno, "Deforestación fuera de control en Venezuela," unpublished paper available on the Internet, <http://www.ciens.ula.ve/~jcenteno/DEFOR-ES.html>. According to Centeno (1995, p. 28) approximately one third of the area under concession is destroyed or severely degraded from forest management practices. Thus, the remaining forest reserves and woodland lots under concession were characterized as degraded by using the following formula: $N \times (Y \times 4,000) \times 1/3 = \text{Area Degraded (ha)}$; where N= number of concessions, Y= years in operation, and 4,000 represents the average yearly area on which each concessionaire operates. No estimate for the amount of hectares impacted by mining was included because of a lack of data.
- 68** C.J. Sharpe et al., "The Effects of Structural Adjustment on the Venezuelan Environment as Illustrated by Trends in Basic Environmental Indicators," a contribution to the WWF-International/ HIID Project: Structural Adjustment and the Environment (CENDES/UCV: Caracas, 1994); J.C. Centeno, "Deforestación fuera de control en Venezuela," unpublished paper available on the Internet, <http://www.ciens.ula.ve/~jcenteno/DEFOR-ES.html>
- 69** U.S. Geological Survey/ Tecmin, *Geology and Mineral Resource Assessment of the Venezuelan Guayana Shield*, Survey Bulletin 2062 (USGS/ Corporación Venezolana de Guayana: Denver, CO, 1993), p. 91.
- 70** Specifically, the analysis states: "The extensive permissive area and the wide range of placer gold grades and tonnages make it difficult to estimate the potential number of undiscovered deposits, but their number and the amount of probable contained gold are thought to be significant." G.J. Orris, "Placer Gold" in U.S. Geological Survey/ Tecmin, *Geology and Mineral Resource Assessment of the Venezuelan Guayana Shield*, Survey Bulletin 2062 (USGS/ Corporación Venezolana de Guayana: Denver, CO, 1993), p. 86.
- 71** Wall Street Journal, "Construction of Gold Mine in Venezuela is Launched" (August 4, 1997).
- 72** Estimates of the number of illegal miners vary widely. Higher estimates generally come from the Ministry of Energy and Mines, which claims up to 100,000 miners are not currently paying royalties on material they extract. See W. Franco et al., "La situación actual de la reserva forestal Imataca y propuestas para orientar su ordenamiento," (Ministry of Energy and Mines: Caracas, 1997). A lower projection of under 20,000 miners was given by Electrificación del Caroní (EDELCA). See Alexandre Barreto and Sylvia Pérez-Puelles, "Estudio integral de la actividad minera en la cuenca hidrográfica del Alto Caroní" (II Jornadas Profesionales de EDELCA, Oct. 1991).
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- 77** B. Müller, "Esto es mi ambiente, aquí tengo vida: la colonización de los bosques del estado Bolívar (Venezuela) por los buscadores de oro y diamantes en el contexto del desarrollo regional," paper presented to Small-Scale Mining Workshop, Puerto Ordaz, Bolívar, September, 1997.
- 78** B. Müller, "Esto es mi ambiente, aquí tengo vida: la colonización de los bosques del estado Bolívar (Venezuela) por los buscadores de oro y diamantes en el contexto del desarrollo regional," paper presented to Small-Scale Mining Workshop, Puerto Ordaz, Bolívar, September, 1997.
- 79** Severely degraded areas were cited in W. Franco et al., "La situación actual de la reserva forestal Imataca y propuestas para orientar su ordenamiento," (Ministry of Energy and Mines: Caracas, 1997). However, little is known regarding the regeneration of forests in the region.
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