Environmental Security in the Dominican Republic: Promise or Peril?

A Pilot Case Study
Foundation for Environmental Security and Sustainability

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FESS Foundation for Environmental Security & Sustainability

USAID FROM THE AMERICAN PEOPLE

The **Foundation for Environmental Security and Sustainability (FESS)** is a public policy foundation established to advance knowledge and provide practical solutions for key environmental security concerns around the world. FESS combines empirical analysis with field research to produce policy-relevant reports and recommendations that address environmental conditions that pose risks to national, regional, and global security and stability.

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Cover photo: Rio Ozama, Santo Domingo
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ACRONYMS

CAFTA	Central American Free Trade Agreement
CCC	Critical Country Concerns
CDE	Corporación Dominicana de Electricidad/Dominican Electricity Corporation
CNE	Comisíon Nacional de Energía/National Energy Commission
CONAU	Consejo Nacional de Asuntos Urbanos/National Council for Urban Affairs
ESF	Environmental Security Factors
DR	Dominican Republic
ESI	Environmental Sustainability Index
ECLAC	UN Economic Commission for Latin America and the Caribbean
FAO	Food and Agriculture Organization
FLACSO	Facultad Latinoamericana de Ciencias Sociales/Latin America Social Science Faculty
ESAF	Environmental Security Assessment Framework
FESS	Foundation for Environmental Security and Sustainability
FTZ	Free Trade Zone
IRG	International Resources Group
NTE	Non-Traditional Exports
PLD	Partido Liberacíon Dominicano/Dominican Liberation Party
PRD	Partido Revolucionário Dominicano/Dominican Revolutionary Party
PUCMM	Pontificia Universidad Católica Madre y Maestre
SEMARN	Secretária de Medio Ambiente y Recursos Naturales/Secretariat of the Environment and Natural Resources
UGAMS	Unidades de Gestión Ambiental Municipales/Municipal Environmental Management Units
HDI	United Nations Development Program's (UNDP) Human Development Index
HPI	UNDP's Human Poverty Index
UNEP	United Nations Environment Program
USAID	U.S. Agency for International Development

EXECUTIVE SUMMARY

I. Introduction: FESS and Its Approach to Environmental Security

This is the report of a study on environmental security in the Dominican Republic conducted by the Foundation for Environmental Security and Sustainability (FESS) during the second half of 2004. FESS is a public policy foundation that works to advance knowledge and provide practical solutions for environmental concerns that pose risks to national, regional, and global security. With the support of Congress, and through a grant from the U.S. Agency for International Development (USAID), FESS has developed a standardized research methodology, the Environmental Security Assessment Framework (ESAF). The ESAF is a tool of analysis that yields policy recommendations that address environmental problems that have actual or potential implications for security.

At the request of USAID, FESS has undertaken a series of pilot studies in three nations. The first pilot study focused on Nepal and was completed in the spring of 2004. The findings of the second case study, on the Dominican Republic, are the subject of the present report. The third study, on Uganda, will be completed in early summer 2005.

In each case, the environmental security assessment has proceeded on two levels—both as a field test of the ESAF methodology and as a focused country study aimed at producing specific policy recommendations for decision-makers and stakeholders.

FESS employs the following working definitions of environmental security and environmental insecurity:

- *Environmental security* is a condition in which a nation or region, through sound governance, capable management, and sustainable utilization of its natural resources and environment, takes effective steps toward creating social, economic, and political stability and ensuring the welfare of its population.

- *Environmental insecurity* is a condition in which a nation or region fails to effectively govern, manage, and utilize its natural resources and environment, causing social, economic, or political instability that leads over time to heightened tensions, social turmoil, or conflict.

II. Relevance of the Dominican Republic to U.S. Interests and Security

The United States and the Dominican Republic (DR) are linked in a complex and continuing web of historical, geographic, economic, political, and human ties. This tight interdependence means that events in the Dominican Republic have security consequences for the United States in such areas as diplomacy, trade, legal and illegal migration, drug trafficking, and remittances.

- With a population of 8.8 million and an area of 18,000 square miles, the Dominican Republic is the second largest country in the Caribbean (after Cuba). A two-hour flight from the U.S. mainland and only a few miles from the shores of Puerto Rico, the Dominican Republic is a key part of America's "third border." As such, the DR has the potential for becoming an ideal transshipment point for drugs, weapons, unauthorized immigrants, and other illicit activities should the country become unstable.

- Presidential Determination No. 2003-38 placed both the DR and Haiti on the "Majors List" of drug transit or illicit drug-producing countries. Many people interviewed for this

report, both in and out of government, indicated that the penetration of drug trafficking into the Dominican military, government, and other institutions, as well as the increase in drug-related violence, are troubling trends for national security and stability.

- Haitian exiles in the Dominican Republic have often been a source of tensions in bilateral relations and a source of instability for Haiti. Several hundred thousand Haitians live in the Dominican Republic (some observers estimate the number as high as one million), a figure that includes many undocumented immigrants.

- The illegal movement of persons from the Dominican Republic to the United States, especially to Puerto Rico, is a significant and growing problem. In FY 2004, of 10,899 Coast Guard interdictions, almost half (5,014) involved Dominicans, followed by Haitians (3,229), and Cubans (1,225).

- The United States is the Dominican Republic's main trading partner, with bilateral trade of $9 billion. Twice as many Americans visited the Dominican Republic in 2004 as visitors from any other nation. In 2004, out of a total of 2.866 million visitors, 931,246 were Americans. The United States is also the leading investor in the Dominican Republic. U.S. companies have major investments in Dominican free trade zone (FTZ) operations, which constitute one of the three main pillars of the Dominican economy, along with tourism and immigrant remittances.

- The Dominican Republic is a strong political ally of the United States and supports U.S. efforts to stem the drug trade and transnational crime. In August 2003, the Dominican Republic dispatched 302 troops to Iraq, where they served until May 2004.

- In the last 20 years, more immigrants from the Dominican Republic have been admitted to the United States than from any country in the hemisphere except Mexico, and Dominicans were the fastest-growing Latino group in the United States during the 1990s. Remittances sent by Dominicans in the United States (over $2 billion in 2003) support hundreds of thousands of households, provide financing for businesses, and account for 25 percent of the country's foreign exchange.

III. Methodology

The Environmental Security Assessment Framework identifies risks to nations and regions that arise as a result of the interactions of environmental conditions with political, economic, and societal factors, and evaluates the implications of those risks for development, stability, and security. It incorporates an extensive set of variables derived from multiple secondary and primary sources and examines their interactions with a view toward formulating alternative scenarios and specific policy recommendations. The goal of the ESAF is to inform policymakers, facilitate the establishment of clear priorities, and contribute to the development of effective and sustainable programs. (A detailed outline of the ESAF appears in Appendix II of the complete version of this report.).

- The conceptual touchstone and key dependent variable of the analysis is *security.* Thus, this study focuses on the pathways by which environmental problems and the use or abuse of natural resources may threaten the Dominican Republic's stability and security. The diversity and depth of interdependence between the Dominican Republic and the United States means that insecurity and instability in the Dominican Republic has potential ramifications for U.S. security.

- The national security implications of environmental stresses are especially compelling in the case of the Dominican Republic, a poor island state vulnerable to natural hazards, with an economy moving from a centuries-old agricultural base toward the rapid expansion of tourism, and with increasing numbers of urban poor lacking clean water and basic sanitation. The migratory pressures from neighboring Haiti—itself struggling with a near-collapse of its environmental resources—only serve to strengthen the linkage between environment and security.

- For the pilot case study of the Dominican Republic, in addition to extensive secondary research, a team of FESS researchers made four extensive visits between July and November 2004, conducting 75 interviews with top government officials, legislators, administrators, military officers, policy experts, academics, and representatives of civil society and the private sector (see attached list).

- The field research was conducted in areas of special environmental concern, including the national capital of Santo Domingo, the second largest urban area (Santiago de los Caballeros), and the northwestern and eastern regions. Areas of particular focus included the border region with Haiti in the northwest and the Punta Cana/Bávaro tourist concentration in the east. Questions generated from the ESAF, mostly open-ended, provided the basic framework for the interviews. In addition to the data collected through interviews, contacts in the Dominican Republic provided many invaluable documents, studies, and reports.

IV. The Current Context: Dominican Promise, Dominican Peril

In recent years, the Dominican Republic has demonstrated both a capacity for political and economic progress and a vulnerability to sudden and unexpected reversals. This volatility has raised special concerns in the areas of environmental trends, relations between Dominicans and Haitians, and prospects for sustained economic growth.

Environmental Trends

The status of environmental stewardship in the Dominican Republic can be evaluated from contrasting perspectives. On the pessimistic side:

- A leading Dominican scholar and environmentalist in an interview cited trend data and concluded: "We are destroying our environment today faster than the Haitians destroyed theirs in the last century."
- The *2005 Environmental Sustainability Index* of the World Economic Forum ranked the Dominican Republic 119 out of 146 nations; Haiti at 141 and Trinidad and Tobago at 139 were the only country in the Western Hemisphere ranked lower.
- Unsustainable agricultural practices (e.g., hillside farming, deforestation, improper or excessive irrigation) have raised yields but also resulted in soil erosion and salinization.
- Tourism, the new leading industry, is contributing to salinization of surface and ground waters in the country's coastal areas; increasing stress on fragile wetlands, mangroves and reefs; and aggravating vulnerability to natural hazards.
- Rapid urbanization is creating environmental problems that are outpacing the state's capacity to respond.
- The overall increase in forest cover between 1980 and 1998 was only 1.1 percent; continuing deforestation and costly reforestation appear to cancel each other out.

On the optimistic side:

- 28 percent of the Dominican Republic is still forested (compared with 1 percent in Haiti).
- Legal and institutional mechanisms for environmental protection have been created recently, and environmental advocacy and consciousness are growing.
- Rapid deforestation began to decrease around 1980 and has been slightly reversed since; coniferous forest cover increased tenfold between 1980 and 1990.

The Dominican Republic still has time to prevent the disastrous environmental decline that has afflicted Haiti. The DR has made significant progress, especially in curbing deforestation and instituting environmental regulation. But efforts to stop soil erosion, salinization, and coastal and marine degradation have not yet succeeded, nor has the effort to provide sanitation to the rapidly increasing urban population produced significant advances.

Demography, Economic Change, and Dominican-Haitian Tensions

The Dominican Republic has been experiencing a demographic transition since the middle of the twentieth century.

- High birth rates propelled a 355 percent increase in the population between 1950 and 2000.

- Since 1970, urbanization, increased education, and economic growth have led to sharply decreasing birth rates and decreasing population growth, despite increasing life expectancy.

- Birth rates and population growth rates will continue to drop as the urban population increases from 58.9 percent in 2002 to 64.6 percent by 2015. Large urban-rural differences in living standards will fuel urbanization for the foreseeable future.

The Dominican Republic has undergone an economic transformation during the same period.

- National income has multiplied in recent decades. Except for occasional recessions, the economy has been growing steadily since World War II.

- The main agricultural export commodities that had been central to the economy—sugar, coffee, and tobacco— have declined in importance.

- Tourism, free-trade zones, and immigrant remittances have emerged as the key sectors of the economy.

Economic growth has not increased the living standards of all sectors of the population.

- Large-scale unemployment, underemployment, and informal employment continue.

- Most jobs in tourism and free-trade zones are low wage.

- Limited economic opportunities drive a large and continuing flow of legal and illegal immigrants to the United States; remittances have become both a major source of national income and a matter of survival.

The Dominican Republic is not only a major immigrant-sending country but also a significant destination for immigrants, resulting in a familiar debate over the balance of positive and negative consequences of that immigration.

- Haitian workers are present in ever-wider sectors of the economy, have become integral to its functioning, and are especially key for agriculture, construction, and the landscaping of tourist facilities.

- Prejudice and the history of binational conflict make the growing Haitian presence a source of tensions.

- The Haitian population in the Dominican Republic, over 75 percent male and mostly undocumented, poses challenges to the DR in terms of human rights, legal rights, social conditions, and health.

- In combination, environmental problems, the vulnerability of key economic sectors, and Dominican-Haitian tensions have the potential to contribute to instability and insecurity in the Dominican Republic.

Democracy, Corruption, and Debt

By the late 1990s, the Dominican Republic not only boasted a democratically elected government, a relative rarity in the country's history, but also the highest economic growth rate in all of Latin America. The outlook appeared optimistic during the early stages of the Hipólito Mejía administration (2000-2004), but seriously deteriorated during its latter stages.

- The BANINTER banking group scandal, the massive government bailout of investors, and the steep decline in the value of the peso produced a sharp drop in the purchasing power of salaries and pensions.

- In 2003-2004, government debt skyrocketed, the economy contracted, chronic blackouts plagued the country, GDP per capita decreased by 25 percent, and political and social discontent mounted leading to the election in August 2004 of opposition leader Leonel Fernández.

Huge challenges faced the new administration, involving intertwined economic, fiscal, debt, and electricity crises, all coupled with high popular expectations.

- The new government, through a combination of fiscal reforms and spending cuts, succeeded in stabilizing the economy, curtailing popular discontent, and increasing the confidence of investors and foreign governments in the Dominican Republic.

- Looking beyond the crisis, the main growth pillars of the Dominican Republic face significant challenges. Tourism is vulnerable to natural disasters and environmental degradation. The free trade zones face new competition in the global market. Remittances may continue to grow in the short run, but decreasing net Dominican immigration into the United States raises doubts about the continuation of this trend.

- As the experience of the late 1990s shows, the Dominican Republic has the promise of sustained economic growth under democratic governance. But, as the 2003-2004 crisis suggests, that progress is fragile.

V. Findings

Our research identified seven general areas of concern in relation to environmental security. Five of them relate to institutional weaknesses of the Dominican state:

1) Environmental Governance
2) Electricity
3) Natural Hazards
4) Land Use Planning and Management
5) Unsustainable Practices in Agriculture and Tourism.

Two other problems relate to deep-seated economic, social, and political realities in the Dominican Republic:

6) The Poverty-Environmental Degradation Nexus
7) Dominican-Haitian Tensions—One Island, Two Nations

Institutional Weakness

In both state and civil society in the Dominican Republic, the absence of rules, low rates of compliance with existing rules, and the limited capacity (or will) to enforce rules both reflect and reinforce values and norms that undermine the efficient and sustainable use of the country's natural endowment.

Environmental Governance

The Dominican Republic enacted a general environmental law in August 2000 (Law 64-00), which created the Secretariat of Environment and Natural Resources (SEMARN) to oversee the design and implementation of a regulatory regime covering most major environmental issues, such as air and water quality, pollution control, habitat and species conservation, protected areas, and environmental impact. This was a major step toward ensuring environmental protection and security in the DR, but a number of problems persist.

- The laws covering specific sectors, such as protected areas, have been enacted only recently or have not yet been enacted.
- Political considerations and a crisis-management approach often drove decisions during SEMARN's first four years.
- The Environmental Council called for in the environmental law was not organized during this period.
- SEMARN has many talented and dedicated employees, but not enough sufficiently trained professionals to carry out its mandate.
- The failure to establish effective coordination among the relevant government agencies is a critical concern.
- Corruption continues to be a key concern as evidenced in the sector law on Protected Areas, passed under questionable circumstances during the final days of the Mejía administration, which opened environmentally sensitive areas to investors.

The outlook for the immediate future is somewhat more optimistic.

- The new administration appears more inclined toward institutional development than the former one.

- The minister of the environment has identified the preparation of draft sector laws on Biodiversity, Coastal Marine Resources, and Forestry Resources as a top priority in the near term, and work is underway in all three areas.

- The minister is moving toward establishing the Environmental Council and is reaching out to civil society and environmental groups.

- SEMARN is considering legislative options to recapture some of the lost authority to protect sensitive environmental areas.

The Electricity Crisis

- There have been recurring "electricity crises" in the Dominican Republic for more than two decades.
- The DR electricity problem is complex, with social, institutional, cultural, financial and technical dimensions.
- The first Fernández administration's (1996-2000) partial privatization opened the electricity sector to foreign investment, increased the number of consumers paying their electricity bills, and produced some financial recovery and reduction in government subsidies. But the system's weaknesses, including massive reliance on oil imports and the social and political demand for large government subsidies remained.
- The fiscal and economic crisis of the latter half of the Mejía administration led to government underpayment to the electric companies, massive blackouts, and a state takeover of the previously privatized companies.
- Resolving the electricity crisis will require the state to confront powerful business interests, ensure the integrity and effectiveness of the judicial system in prosecuting fraud and theft, reduce gradually the subsidies provided to a vast political constituency of poor people through more universal collection, invest in the maintenance and modernization of the electricity infrastructure, and begin a serious push to develop alternative sources of energy.

Natural Hazards

The Dominican Republic is vulnerable to major disasters, especially hurricanes and floods, but also earthquakes and tsunamis. Indeed, hurricanes and floods have inflicted major human and material tolls in the last decade, prompting a response from the state and civil society.

- The creation of a National Emergency Commission has increased coordination among relevant agencies and improved the Dominican Republic's capacity to respond to natural disasters.
- Further improvements are essential given the high risks and potential economic and security costs and implications; the Commission and its Civil Defense suffer from excessive centralization and a scarcity of resources.
- Urbanization, population growth, and tourist development increase the country's vulnerabilities to natural disasters.
- In order to prepare for and mitigate the negative impacts of natural hazards, the Dominican Republic needs to adjust its priorities in terms of resources and focus. Policies must correspond to the potentially grave consequences of natural disasters.

Land Use Planning and Management

- The virtual absence of zoning standards and land use planning is degrading the country's natural resource base and could threaten the future security and stability of the country.

- Rational and sustainable land use is critical to the DR's capacity to feed its population, provide water, develop the tourism industry, and diminish vulnerability to natural hazards.
- Deforestation, cultivation and grazing in unsuitable land, and unplanned urban growth are some of the major consequences of the lack of land use management, leading to erosion and loss of rich soils, water scarcity, loss of hydroelectric generating capacity, and myriad urban environmental problems.
- The absence of land use planning and policies is the legacy of limited institutional capacity, insufficient political priority and will, and scarce human and financial resources.
- Although the Dominican state has been moving toward instituting land use planning for several years, this issue deserves to have a higher priority if planning and management are to catch up with events.

From Slash and Burn Agriculture to Slash and Burn Tourism?

The traditional economy of the Dominican Republic was based on unsustainable practices—including slash and burn agriculture, hillside farming, and overgrazing—but until well into the twentieth century this fact was masked by an abundance of land relative to population. That the declining but still important agricultural sector continues to employ unsustainable methods is perhaps less troubling than the realization that the rising tourism industry appears to be headed in the same direction—only at a faster rate.

- These two critical components of the DR's economy and security—agriculture and tourism—depend heavily on a healthy environment for long-term sustainability.
- The long-term rationality of sustainability often clashes with short-term needs for job generation, income growth, government revenues, debt reduction, political patronage, and profits.
- Agriculture has and will continue to decline (11.5 percent of GDP in 2002) but unsustainable practices continue to extract an environmental toll.
- A driving force behind the irrational use of land and water for agriculture is the desire by political leaders to achieve food security through making the food supply as cheap and reliable as possible. Changing this pattern is essential but will require political will.

The tourism sector is widely seen as the DR's motor for growth for the foreseeable future, but there also are major environmental challenges for this industry.

- The tourist industry is plagued by a lack of basic services, such as solid waste disposal; inadequate infrastructure, including water and sewer systems; coral reefs under "high" or "very high" risk levels; shrinking underground aquifers threatened by salinization; and very limited enforcement of environmental laws.
- The emphasis on high volume tourism implies significant environmental degradation that over time may destroy the industry. With no clear strategy to achieve a higher-valued added and more environmentally sound model for the long run, the Dominican Republic may benefit temporarily from an increasing volume of tourism, while undermining the long-term viability of the industry.

Five broad challenges face the Dominican tourism industry.

- Rapid growth of tourism has outpaced the development of infrastructure, policies, and services. One example is that the Environmental Police, charged with enforcing environmental laws, has almost no presence in the main tourist areas of the east.
- The current business model for tourism, "slash and burn" tourism, tends to destroy the aesthetic, environmental, and natural resource base upon which it depends. Scarcity of water may impose environmental and economic limits on the current tourism model.
- Changing the tourism model is difficult because the industry is dominated by foreign hotel operators whose profits depend on a high volume of inexpensive tourism; no environmentally sustainable strategic plan for tourism has yet been developed.
- Recent experience indicates the tourism sector is woefully unprepared even for recurring natural disasters such as hurricanes.
- Tourism has brought with it increasing vulnerability to social conflicts. Tourism has become the new employer for Haitians, who are used as construction and maintenance labor but are underpaid and not sheltered or fed during natural disasters.

VI. Poverty and Environmental Degradation

Despite almost continuous economic growth for 50 years and the boom of the 1990s, by every measure widespread poverty continues to plague the Dominican Republic, which ranks 17th out of 23 Western Hemisphere countries on the UNDP Human Poverty Index. Persistent poverty has serious political and social consequences for the DR as well as major implications for the environment and, ultimately, for national security.

- Poverty makes the tradeoffs between short-term economic gains and longer-term economic, environmental, and security concerns more conflictual for nation-states, firms, households, and individuals.
- Government funding for the environment must compete with basic needs such as nutrition, health care, and education.
- For rural Dominicans, the choice may be clearing forests or brush for agriculture or going hungry (or migrating to a big city or another country). For Haitians, the choice may be to cut down trees in order to make charcoal for cooking or to starve.
- Rural poverty not only promotes unsustainable cultivation practices, but through out-migration also aggravates urban environmental problems, possibly leading to instability and violence.

VII. One Island, Two Nations

Haiti is an important variable in the Dominican Republic's environmental security equation. Hispaniola is the *only* island in the world encompassing two independent nations. United by geography and ecology, the two sides of the island are separated by divergent histories; a background of war, occupation, and genocide; racial, linguistic, and cultural differences; flare-ups of mutual suspicion and antipathy; and striking differences in levels of development and environmental conditions. Asked whether he agreed with other interviewees that Dominican-Haitian relations constitute a "time bomb," one prominent Dominican intellectual who has written on the subject said: "It is a ticking *atomic* bomb." Immigration (resulting partly from environmental devastation in Haiti) and natural resources, especially trees, are at the center of Haitian-Dominican tensions today.

While Haitian protests over their mistreatment in the Dominican Republic traditionally have been non-existent or muted given high levels of intimidation and the undocumented status of a

substantial percentage of the Haitian-origin population, five factors may contribute to a change in the foreseeable future.

- Recent Haitian immigrants to the Dominican Republic are mainly of urban origin and live outside the tightly controlled sugar mill *bateyes*, changes that provide a more favorable climate for mobilization in defense of rights.
- A growing number of Haitian-origin persons in the DR are Dominican-born. A movement to advocate for the rights of Dominican-Haitians has developed during the last decades, with significant leadership and international recognition.
- The globalization of human rights and the DR's need for increased integration into the international system provide increasing leverage for advocates for Haitians in the Dominican Republic.
- The DR is not making any significant effort to integrate Haitians, and some recent legislation may lead to greater marginalization and a higher probability of conflict and the international stigmatization of the Dominican Republic, with adverse economic and political implications.
- The headwaters of the Artibonite River, the main source of water for crucial rice cultivation in Haiti, are in the Dominican Republic, and represent an area of special concern. Deforestation on the Dominican side threatens to dry up this resource vital to a desperately poor nation; the construction of dams on the Dominican side could also diminish the flow of water into Haiti.

The fate of the Dominican Republic and Haiti are increasingly intertwined. The future of these two nations historically has been a matter of concern for the United States, and they continue to be important to U.S. interests. While the United States understandably has focused a great deal of attention on Haiti in recent years, the success of the Dominican Republic may be as important to the United States as the rescue of Haiti.

VIII. Scenarios: Environmental Security in the Dominican Republic 2005-2015

The Best-Case Scenario

The components of the best-case scenario for the Dominican Republic for 2005-2015 would include:

- A return to economic growth rates like those experienced in the "Dominican miracle" of the 1990s, but this time with a more equitable distribution of income gains and a lower environmental impact. Economic growth with equity would tend to diminish social conflict and political instability, including that related to natural resource competition.

- Change from a model based on low value-added, mass tourism that produces major adverse environmental impacts in fragile coastal areas to a model based on fewer visitors, higher expenditures per tourist, and more diversified tourist activities.

- Institutional development and consolidation of environmental governance, with the promotion of civic and private-sector participation by making the Environmental Council and Fund created by Law 64-00 operational and implementing an effective decentralization of environmental management functions. This would require an increase in the level and quality of human and material resources for SEMARN and the development and implementation of land use plans nationally, regionally, and locally.

- Institutional capacity to mitigate disasters increasing at a faster rate than in the recent past, and hurricanes and earthquakes of average or less frequency and intensity.

- The beginning and early phases of a significant shift from septic tank systems (or the total lack of sanitation systems) to piped sewage systems with adequate and operational waste treatment capabilities, plus the development of a solid waste management strategy.

- A better balance between highly visible investments to increase water access and less visible but essential expenditures to ensure water quality. Improving water quality and reducing diarrheal diseases would be priorities, along with the rationalized use of water based on real costs.

- Political stabilization, renewed economic development, and increased environmental security in Haiti, accompanied by expanded dialogue, trade, improved environmental practices, a quickening in the pace of economic development in the border region, the beginning of multiple destination tourism, and cooperative and sustainable binational management of the Artibonite watershed.

- The achievement of the objective announced by President Leonel Fernández of making the Dominican Republic a model for anti-corruption and transparency in the Caribbean, with the environment ministry leading the way.

- An increase and diversification of the contributions of Dominicans abroad through new investments in environmentally sustainable development projects, new inputs of know-how and capital, and the encouragement of assistance and cooperation by American NGOs and U.S. local and federal governments, including disaster mitigation and relief.

- The elimination or significant reduction of agriculture based on inappropriate land conversion through managed forestry and better agricultural practices, with the emergence of a shift toward a new model of agriculture based on competitiveness in the global market.

- The steady reduction of the DR's extremely high dependence on imported oil, with an increase in wind, hydraulic, biomass, solar and other forms of renewable energy.

- The emergence of new, clean industries offering higher-wage employment opportunities, such as in the digital/high-tech sector and biotechnology.

The Worst-Case Scenario

The components of the worst-case scenario would include:

- GDP growth slower than population growth, resulting in increasing impoverishment, greater stress on natural resources, reduced resources for environmental management and disaster mitigation, increased undocumented migration, and political instability.

- Natural disasters of increasing severity and frequency, with massive casualties and great property loss. These would expose the inadequacy of building codes, evacuation plans, and relief capacities, reducing the legitimacy of the government and leading to political instability and street mobilizations.

- The inability of successive governments from all of the major parties to solve the worsening economic and institutional crises, which would undermine the party system and promote various strands of populism as well as threats of military rule.

- A reversal in the growth of the tourism sector as a result of the myriad environmental problems associated with overdevelopment and/or the emergence of Cuba or other destinations as powerful competitors for tourists.

- A greater deterioration of the situation in Haiti, with increased migration of Haitians to the Dominican Republic, outstripping labor market needs and straining ethnic relations. If this situation led to Dominican repression of Haitians and violent inter-ethnic conflict in the cities and on the border, this would decrease foreign investment and tourism and might also trigger inter-state conflict between the Dominican Republic and Haiti.

- A worsening water shortage within the next ten years, with multiple negative effects for development, environmental security, and human security. The lack of water in the urban slums of Santo Domingo would fuel strife. The scarcity and increasing cost of water would have negative consequences for tourism.

- The failure of the free trade zones to integrate into the evolving global market, with a loss of jobs and the increasing likelihood of social and political unrest.

- Decreased net legal migration to the United States. The legal immigration crunch might trigger an increase in unauthorized migration.

- A worsening of the country's energy problems. The country would continue to rely almost completely on imported oil. Hydroelectric generation would drop as a result of the silting of dams. With demand rising as a consequence of rapid economic development in China, India, and other oil-importing countries, oil prices would rise steeply over the next decade, damaging the Dominican economy. Oil-producing Latin American countries might decrease their subsidies to the Dominican Republic as the revenues lost from such generosity increased.

The Intermediate (and Most Likely) Scenario

The components of the intermediate scenario would include:

- A positive rate of growth moderately above the rate of population growth. The continuing drop in birth rates might contribute to a somewhat steeper increase in GDP per capita than in earlier periods.

- Zero or negative economic growth in free trade zones, as some old industries would be replaced by new ones, allowing employment growth in other sectors to compensate for losses in the free trade zones.

- Water shortages in some areas, with supplies to the two main urban areas continuing despite sporadic shortages, especially in slum areas, while the water supply problem would become acute in some rural regions. This disparity would continue to fuel migration, swelling the urban slums and increasing the potential for conflict.

- The continuation of "slash and burn" tourism, although with a better mix of sustainable and alternative forms of tourism. Decreased supplies of fresh water in tourist areas would limit the growth of mass tourism and encourage alternative and high-end tourism.

- Gradual improvement in environmental governance, including strengthening of the Environmental Police, with predictable setbacks during periods of governmental transition. Civil society groups would strengthen, and an environmental culture would begin to develop and take root among the general public.

- Increased remittances (but at a decreasing rate) for several years before peaking and beginning to decline gradually. The flow of undocumented Dominicans to the United States and of deportations to the DR would fluctuate within manageable parameters for both countries.

- Continued Haitian immigration, with further diversification in Haitian labor market participation. Relations between Haitian immigrants and Dominicans would show a mixed pattern, with continuing tensions and instances of conflict as well as dialogue and cooperation, but no massive repression, deportation, or violence. However, a comprehensive effort to integrate and regularize the legal status of Haitians would not occur.

- Continued heavy reliance on fossil fuels for energy generation, with the oil bill preventing the Dominican economy from sustaining the economic growth rates of the 1990s. The electricity crisis would be alleviated with increased collections and rationalization of the sector, but the government would be forced to maintain substantial subsidies, and there would remain occasional blackouts and possibly short-term or local crises.

- Several major natural disasters with substantial loss of life and property damage. Whether a massive, transformational disaster would take place is unpredictable. The capacity of the Dominican state to deal with "normal" disasters would continue to improve incrementally over the decade.

IX. Transformational Development or Toward a Vulnerable State?

The contrasting futures alluded to by the subtitle of this report—one of promise or one of peril—both reflect plausible outcomes for the Dominican Republic.

- The central thesis of this report is that the lack of a strategic focus on environmental and natural resource issues, in the context of the country's complex political and economic dynamics, presents a possible threat over the medium term to the stability and security of the Dominican Republic. An unstable Dominican Republic is a potential threat to U.S. interests and security.

- Today, the impact of environmentally unsound practices and the depletion of finite resources are becoming ever more apparent in land degradation, the deterioration of marine and coastal areas, diminishing water supplies, and increasingly polluted and unhealthy urban areas.

- Tourism stands out as the likely engine of growth for the DR over the short to medium term. Yet, there are a host of concerns associated with the current tourism model that call

into question its sustainability, including the lack of infrastructure, inadequate sanitation facilities, saltwater intrusion, weak regulatory enforcement, and lack of preparedness for natural hazards.

- SEMARN will need increased institutional strength and presidential backing to resist powerful political and economic interests seeking private gain at public expense. Similarly, only with support from the executive will SEMARN be able to hold its own in interagency policymaking and in its effort to make environmental and natural resource issues cross-cutting policy concerns throughout the government.

- SEMARN will be tested as well in terms of its enforcement capacity, and the recent strengthening of the Environmental Police is an important step in the right direction.

- There are no silver bullet solutions for the deterioration of living conditions and the persistence of poverty in Santo Domingo and other urban areas, but steps to address issues of waste disposal, water quality, and threats to public health can provide immediate benefits to crowded and impoverished neighborhoods and provide the political legitimacy necessary to carry out more ambitious reforms.

- Migratory and environmental pressures on the Dominican Republic will continue to spill over from Haiti for the foreseeable future. Binational cooperation on programs for environmental protection (or restoration) and sustainable livelihoods has the potential to decrease tensions and increase security on Hispaniola.

- The DR faces many challenges in disaster preparedness, mitigation, and response, but two key areas where progress must be accelerated are decentralization and the integration of civil society. Remote communities need both better information and communications and basic resources to improve their disaster response capacity. As a matter of stability and security, much depends on the perception of citizens that in the event of a national catastrophe the state will respond vigorously, effectively, and with integrity.

- The Dominican Republic remains a candidate par excellence for "transformational development," which seeks to enable a country to sustain further economic and social progress without depending on foreign aid. But the economic reversals and precipitous loss of public confidence from 2003 to 2004 left the country, as President Fernández has put it, "like a patient in intensive care."

- Indeed, as the latest USAID white paper on "fragile states" points out, it is often "more important to understand how far and quickly a country is moving from or toward stability" than to categorize it in one way or another. From early 2003 to mid-2004, the Dominican Republic moved quite rapidly toward the unstable pole of the continuum; since that time the country has been making steady progress toward regaining stability.

- Many environmental and natural resource management questions face the Dominican Republic. What will happen if the economy's leading sector, tourism, falls into decline or collapses? How much longer can the country afford the costs and losses of misguided or nonexistent land use policies? What will people do in the face of severe water shortages? How much stress can the social fabric sustain in terms of poverty, narrowly shared economic growth, environmental degradation, and Dominican-Haitian tensions?

What will be the reaction of the population to poorly coordinated or ineffectual government responses to a series of natural disasters?

- Each of these questions—and possibilities—implies that there is a tipping point at which public attitudes shift, the ability of the state to provide basic services and security comes into question, and the very legitimacy of the government gives way.

- The challenge now for the Dominican government, civil society, and the international donor community is to ensure that actions in support of environmental security are implemented quickly and effectively in order to move the country away from the potential dangers of instability and conflict and toward a path of sustained development.

I. FESS AND ITS APPROACH TO ENVIRONMENTAL SECURITY

The Foundation for Environmental Security and Sustainability (FESS) is a public policy foundation established to advance knowledge and provide practical solutions for key environmental concerns that pose risks to national, regional, and global security. With Congressional support, and through a grant from the U.S. Agency for International Development (USAID), FESS has developed the Environmental Security Assessment Framework or ESAF, a research methodology that uses a consistent, formalized analysis to construct policy-relevant recommendations that address potentially destabilizing environmental conditions.

At USAID's request, in order to develop and refine further the ESAF methodology, FESS has undertaken a series of three country-level environmental security assessment pilot case studies. The first pilot study, on Nepal, was completed in the spring of 2004; the present report on the Dominican Republic constitutes the second case study; and a third study, on Uganda, is currently underway and will be completed in late spring 2005. In each case, the environmental security assessment has proceeded on two levels—both as a form of field testing the ESAF methodology and as a focused country study aimed at producing specific policy recommendations for decision-makers and stakeholders.

Because the use of the term "environmental security" remains relatively new and subject to varying interpretations, it is worth stating at the outset the conceptual basis and approach of this pilot study on environmental security in the Dominican Republic. As a point of departure, FESS employs the following working definitions of environmental security and environmental insecurity:

- *Environmental security* is a condition in which a nation or region, through sound governance, capable management, and sustainable utilization of its natural resources and environment, takes effective steps toward creating social, economic, and political stability and ensuring the welfare of its population.

- *Environmental insecurity* is a condition in which a nation or region fails to effectively govern, manage, and utilize its natural resources and environment, causing social, economic, or political instability that leads over time to heightened tensions, social turmoil, or conflict.

An environmental security assessment examines environmental and natural resource issues as central questions and core analytic variables. However, the conceptual touchstone and key dependent variable is *security*. Thus, the study that follows focuses on the pathways by which environmental problems and the use or abuse of natural resources may threaten the Dominican Republic's stability and security rather than the general state of the environment in the country, which has been addressed by other researchers (International Resources Group 2001, World Bank 2004b). At the same time, as discussed in the body of the report, the diversity and depth of interdependence between the Dominican Republic and the United States means that insecurity and instability in the Dominican Republic has potential ramifications for U.S. security interests.

As USAID Administrator Andrew Natsios has pointed out, the 2002 *National Security Strategy of the United States of America* placed development "on a par with defense and diplomacy" as a "central component of national security strategy" (USAID 2005, v-vi). More specifically, in the October 2003 *Declaration on Security in the Americas*, the United States joined its Western Hemisphere neighbors in recognizing the emergence of a complex set of factors that contribute to

insecurity and instability. In addition to terrorism, transnational organized crime, and the global drug problem, these include "natural and man-made disasters" and "environmental degradation." Thus, better monitoring, analysis, and early warning of these emerging risks to security have become policy imperatives.

The linkages between environment and security are not straightforward, however. Indeed, multiple political, economic, and social factors interact among themselves and with environmental variables to determine potential threats to a nation's security and vulnerability to environmentally related conflict. While there is intense debate on many issues in the growing literature on environmental security, there is general agreement that rarely can environmental degradation be identified as the *sole* cause of endemic insecurity and instability (Homer-Dixon 1999, Dabelko et al. 2000, Najam 2003). More typically, environmental factors are interactive variables, influencing and being influenced by other security-related variables, such as governance, economic performance, and social relations, to produce effects that can be powerful and consequential**.**

Despite their significance, by their very nature such interactive variables can be difficult to capture and are frequently missed in causal analysis. This is especially true in regard to environmental security. While purely environmental analyses often do not make direct linkages to livelihoods, social tensions, and insecurity, traditional security analyses can focus too narrowly on political and economic conflict without exploring environmental factors that often contribute significantly to the potential for instability. However, by understanding the origins and implications of those environmental stresses that place essential resources at risk—for example, deforestation, soil erosion, natural hazards, and the despoiling of coastal resources—policymakers can gain fundamental insights into broader issues of stability and security.

The case for the significance of environmental stresses in relation to national security is especially strong for the Dominican Republic, a poor island state susceptible to both frequent hurricanes and less frequent but potentially devastating earthquakes, with an economy moving from a centuries-old agricultural base toward the rapid expansion of tourism, and with increasing numbers of urban poor lacking clean water and basic sanitation. The migratory pressures emanating from Haiti and the shared border with that distressed nation—itself struggling with a near-collapse of its environmental resources—only serve to strengthen the argument.

Yet, while the general importance of environmental factors for the Dominican Republic may be obvious, more specific research and analysis is required to formulate effective policies capable of mitigating or eliminating environmental threats to stability and security. Specifically, it is essential to understand *how* the linkages between environment and security intertwine with patterns of governance, economic practices, and social and cultural values to produce security-relevant outcomes. This implies that, in order to identify and address environmentally derived threats to security, the environmental security assessment must be grounded in a multidisciplinary matrix like that used in the ESAF.

To date, the field of environmental security has been marked by an asymmetry between the large number of mostly conceptual discussions and the still quite limited base of empirical knowledge. There is a clear need to build the knowledge base for environmental security analyses through specific case studies in diverse locales. There is also a need to sharpen the ability to distinguish between those environmental issues that *do* reach the threshold of environmental security—i.e., raising fundamental concerns about instability and insecurity—and those that *do not* meet that threshold. Most importantly, insights from environmental security assessments need to be expressed in ways that policymakers can readily understand and consider in their decision-

making. Filling these lacunae and meeting these needs represent considerable challenges, toward which this pilot case study of the Dominican Republic is one contribution.

The Formal ESAF Methodology

The Environmental Security Assessment Framework (ESAF) is structured to identify risks to nations and regions that arise as a result of the confluence of environmental and political, economic, and societal factors, and to evaluate the implications of these risks. The ESAF seeks to answer questions of what implications environmental issues may have for development, stability, and ultimately, security. The ESAF is also intended to provide consistency for comparisons across countries and regions, while being sufficiently adaptive to account for nuances of local economic, political, social, cultural, and environmental factors. The goal of the ESAF is to inform policymakers, facilitate the establishment of clear priorities, and contribute to the development of effective and sustainable programs.

The ESAF engages a diverse set of variables relevant to environmental security. (A detailed outline of the ESAF appears in Appendix II at the back of this report.) These are examined in their interactions and filtered through a series of analytic phases that lead to the formulation of scenarios and policy recommendations.

The ESAF makes use of various categories of stability and instability (e.g., social cohesion, livelihood security, political participation) as initial barometers of security conditions in a country or region. These terms are not seen as dichotomous, but rather as a sliding scale, with instability becoming more acute and relevant to security as it moves through stages of heightened tensions, turmoil, and conflict. These stages may be nonlinear, temporary, or reversible, and the wide-ranging variables generated by the ESAF provide the context necessary to help make such judgments. In certain contexts (e.g., countries marked by authoritarian rule and poor environmental governance), *stability itself* might be associated with environmental security problems. In essence, the ESAF provides a kind of "thick description," involving the use of layers of interrelated information to refine and recontextualize understandings and distill hypotheses that lead to credible scenarios and, ultimately, actionable recommendations.

The ESAF proceeds in seven phases. *Phase I s*ets out the initial profile of the country or region under study. The country profile develops a preliminary assessment of potential political, economic, social, and cultural cleavages and contentions that may contribute to instability and/or insecurity. Thus, for example, the *political* analysis examines power distribution and forms of disputation; the *economic* analysis looks into patterns of productivity, employment, and the distribution of benefits from the current structure of production; and the *social* analysis looks at tensions associated with class, ethnicity, race, and religion.

This phase also collects data on U.S. and international aid according to organization and agency. These data are considered later in the ESAF, when assistance responses are considered in light of all the efforts already undertaken by the relevant governments and organizations.

Phase II recognizes that environmental security is grounded in the tangible linkages among economic activities, social conditions, and the environment. This phase, therefore, identifies *critical country concerns* by examining economic and social data linked to the environment and by framing these analyses within the overall concept of environmental sustainability, which is reflected in a third set of data.

The information collected on environmental sustainability provides a profile of the natural setting and environmental trends within which socioeconomic activities take place. This includes such

information as land under cultivation, rates of deforestation, and available water resources. Phase II's *econo-environmental* analysis determines significant natural resource-based sectoral contributors (e.g., agriculture, mining, tourism), the relationship between employment and the environment, and the structure of trade based on environmentally derived goods. The *socio-environmental* analysis focuses on livelihoods, food security, education, and health, bringing into view such relationships as demographics and migration, staple crops and nutrition, and sanitation and diseases. The *enviro-sustainability* analysis provides a baseline view of the conditions and usage of key natural resources (e.g., land, water, and energy).

Through these analyses, a clearer view emerges of key socioeconomic sectors (i.e., those important for stability) and their linkages to the environment. *Critical country concerns* (CCC) are defined as issues and/or resources that may be directly or indirectly critical to stability, based on their value and significance to the nation's economy and social well-being. These CCCs serve as the relevant input for the next phase of the analysis.

Phase III begins by investigating the relative condition and vulnerability of each CCC. Examples of common critical country concerns include: land and water use regimes; agricultural performance; migration; sanitation; environmental health; and the sustainability of tourism. To understand the scope and underlying factors associated with such concerns, each one is then disaggregated and studied more closely by means of a *vulnerability-threat-stressors-mitigators* (VSTM) analysis. Cross-referenced with a set of contributing factors (e.g., economy, technology, nature, governance), the VSTM breaks apart these key problems and digs deeper into their constitutive dimensions and origins.

This analysis provides a more finely grained basis for assessing the implications for stability and security of each critical country concern. These implications are then schematized, with a further level of refinement introduced by linking these implications to the interests of relevant stakeholders. How do these problems affect the lives of those groups who are bound up, whether positively or negatively, in the environmental problem under study?

Here, a key distinction is made. *Not all environmental problems are problems of environmental security.* Therefore, a preliminary judgment is rendered about which problems are to be identified as *Environmental Security Factors* (ESF). ESFs are defined as problems that have significant implications for political, economic, and social stability and welfare, and which may pose a security concern or contribute to the creation of one. At this point, by having first expanded the scope and complexity of the analysis and then engaged in a process of differentiation that leads to the environmental security factors, the ESAF has significantly sharpened the power and focus of the overall environmental security analysis.

Phase IV adds another crucial level of refinement to the ESAF through a detailed examination of *environmental governance*, defined as the traditions and institutions by which power, responsibility, and authority are exercised over a nation's natural resources.

At the heart of this phase are questions about the structure and coverage of legal and regulatory frameworks and the level of political will and capacity for enforcement. This phase also recognizes the increasing significance of effective civil society participation within a democratic context, and it asks questions about citizen access to public institutions for airing grievances, perceptions about the responsiveness and integrity of institutions and officials having responsibility for environmental governance, and plans and capacities for responding to shocks, such as natural hazards. Based on these steps, the understanding of the relative significance of the ESFs is further contextualized.

Phase V is the stage at which the ESAF is ready to generate and field test preliminary hypotheses. Two types of potential crisis scenarios are developed in relation to the ESFs. The first posits likely outcomes if current destabilizing trends remain constant, while the second anticipates shocks to the system. Crisis scenarios are then evaluated in terms of probability and potential impact.

To weave a further level of in-country expertise into the analysis, this phase envisions a roundtable or scenario development workshop for governmental and nongovernmental stakeholders to develop and discuss scenarios. The session provides participants with a review of the ESAF process that serves as a basis for adding their own expert judgments in relation to the preliminary hypotheses and possible scenarios. At the same time, the roundtable or workshop is a capacity-building exercise for the participants themselves. Based on the synthesis of the preliminary hypotheses and the scenario development exercise, scenario reports are then prepared.

Phase VI is devoted to relating the ESAF findings in specific and concrete ways to U.S. assistance activities in the country or region under study. The bulk of the baseline information is already available from work done in Phase I, but this is given further elaboration and enhancement through field interviews with government officials. This assistance profile is then compared and contrasted to the potential scenarios generated by the ESAF to identify gaps and target areas for improved U.S. assistance. This phase then results in a set of preliminary recommendations.

Phase VII is the culmination of the ESAF, providing a comprehensive assessment of both the principal environmental security threats and alternative remedial actions. These are consolidated as ESAF findings in the form of the draft final report and appendices.

In sum, the ESAF is an analytic tool to advance environmental security studies along several different fronts. First, it moves the conceptual debates about environmental security past largely deductive assessments of the relationship between the environment and conflict. Second, it provides a common analytic vocabulary usable by practitioners in both the development and security communities. Most importantly, it generates practical policy recommendations for the use of government officials and other stakeholders, with a view toward promoting economic well-being, social peace, political stability, and environmental sustainability in the countries and regions it examines.

The Field Study

The early phases of the ESAF consist of the extensive collection of data and detailed reviews of relevant literature, but once critical country concerns are identified the crucial field study portion of the investigation begins. For the pilot case study of the Dominican Republic, FESS researchers made four visits, varying in length from one to three weeks, between July and November 2004. Over the course of these visits, approximately 75 interviews were conducted with high-ranking government officials, elected representatives, civil servants, military personnel, policy experts, academics, civil society professionals, and private sector representatives. A list of persons interviewed appears at the back of this report. These interviews were supplemented by dozens of informal conversations with Dominican citizens from all walks of life, which greatly enriched our understanding of key issues of the study.

The field research was conducted in a variety of regions within the Dominican Republic, beginning with Santo Domingo, the capital, and Santiago, the second largest city, followed by

trips to the west, south, and eastern portions of the country. Areas of particular focus included the border region with Haiti in the northwest and the Punta Cana/Bávaro tourist concentration in the east. Interviews were partly structured and partly unstructured. While question sets were derived from the ESAF methodology, interviews were not limited to those sources. The FESS research team made daily assessments of interview results, and preliminary write-ups of key issues were prepared during periods between in-country visits. In addition to interviews, many contacts, both in and out of government, provided and shared with us a wealth of documents, reports, and studies that touched upon important aspects of our investigation. FESS team members made all of the contacts with persons and organizations, and arranged the interview schedules, but the USAID mission in Santo Domingo provided invaluable suggestions and contact information that helped to facilitate our work. For this assistance, we are extremely grateful.

II. RELEVANCE OF THE DOMINICAN REPUBLIC TO U.S. INTERESTS AND SECURITY

The United States and the Dominican Republic (DR) are linked in a complex and continuing web of historical, geographic, economic, political, and human ties. Despite the asymmetries between the two nations in terms of size and power, the depth of interdependence between them means that events in the Dominican Republic have consequences that matter to U.S. interests and security across a variety of issue-areas, including diplomacy, trade, legal and illegal migration, drug trafficking, and remittances.

History

As reflected in U.S. actions over more than 150 years, United States policymakers have assigned a substantial degree of geopolitical importance to the Dominican Republic. During the nineteenth century, the Dominican Republic almost became part of the United States. In 1869, the United States and the Dominican Republic actually signed a treaty of annexation. In 1871, a U.S. Senate fact-finding committee that traveled to the Dominican Republic gave the treaty its approval. But, in spite of that and the support of President Ulysses S. Grant, the U.S. Senate failed to ratify the annexation treaty.

In the twentieth century, U.S. foreign policymakers focused their attention on the Dominican Republic during several historical junctures. In 1911, the United States took over Dominican customs in the context of threats by European powers eager to collect debts. On two separate occasions, the U.S. armed forces were engaged in fighting in the Dominican Republic. U.S. Marines occupied the DR from 1916 to 1924, fighting sporadic skirmishes with Dominican insurgents known as *gavilleros.* In 1965, U.S. Marines again took part in fighting in the DR as members of an American-led, OAS-sanctioned intervention to quell an uprising that U.S. policymakers feared would evolve into a Cuban-style revolution.

In the context of the Cold War and the Cuban revolution, in the 1960s and early 1970s, U.S. policy toward the Dominican Republic stressed a broad range of military and non-military counterinsurgency strategies. In the late 1970s, under the presidency of Jimmy Carter, U.S. policy shifted to a stronger focus on human rights and the promotion of democracy. In 1978, the United States exerted strong political pressure to prevent electoral fraud and ensure a fair election. Subsequently, the United States has provided assistance to promote the development of civil society and to ensure free and fair elections through electoral monitoring and other measures.[1]

Geography, Drugs, and Illegal Migration

With an estimated population of 8.8 million, the Dominican Republic is the second largest country in the Caribbean (after Cuba), covering more than 18,000 square miles (U.S. Census Bureau, International Data Base). A two-hour flight from the U.S. mainland and only a few miles from the shores of Puerto Rico, the Dominican Republic is a key part of America's "third border." As such, the DR has the potential for becoming an ideal transshipment point for drugs, weapons, unauthorized immigrants, and other illicit activities should there be a major crisis of governance in the country.

Currently, although there is an active drug trade in the Dominican Republic, Haiti is a more important drug transshipment point. However, Presidential Determination No. 2003-38 placed both the DR and Haiti on the "Majors List" of drug transit or illicit drug-producing countries.[2] Moreover, as indicated by many people, both in and out of government, interviewed for this report, the penetration of drug trafficking into the Dominican military, high levels of government, and other institutions, as well as the increase in drug-related violence, are troubling trends for national security and stability.

The DR shares a long border with the nation of Haiti, a state whose problems have been of acute concern to the United States for over a decade. Haitian exiles in the Dominican Republic have often been a source of tensions in bilateral relations and a source of instability for Haiti. The number of Haitians living in the Dominican Republic has been estimated as high as one million, a figure that includes many undocumented immigrants.

Although the Dominican armed forces keep watch on the Haitian frontier and the U.S. Coast Guard patrols Puerto Rico's coasts, both borders are relatively porous, especially to unauthorized immigrants. The illegal movement of persons from the Dominican Republic to the United States, especially to Puerto Rico, is a significant and growing problem. From 1982 through 2004, 25,582 Dominicans were intercepted at sea by the U.S. Coast Guard, the third highest number of interdictions, after Haitians (107,384) and Cubans (55,770). However, the number of Dominican interdictions increased during the last fiscal year. In FY 2004, of 10,899 Coast Guard interdictions, almost half (5,014) involved Dominicans, followed by Haitians (3,229) and Cubans (1,225). During the first few months of FY 2005, the number of interdicted Dominicans dropped, and Haitian and Cuban interdictions once again surpassed the number of Dominican interdictions, a possible sign of improving conditions or increased optimism in the DR (Department of Homeland Security 2005).

Economics and Politics

The United States is the Dominican Republic's main trading partner. Although the DR is a relatively small market, it is not an insignificant one for U.S. exporters, as the United States provides the country with over half its imports. Two-way trade with the Dominican Republic was nearly $9 billion in 2003 (USTR 2004). Although the Dominican Republic was an "add-on" to the Central American Free Trade Agreement (DR-CAFTA, signed on August 5, 2004), U.S. trade with the DR actually surpasses that of the United States with any of the Central American countries.

Conversely, in spite of the geographical proximity of the United States, the U.S. accounts for only about a third of international visitors to the Dominican Republic, with the rest coming mainly from Europe and Canada. Nonetheless, twice as many Americans visited the Dominican Republic in 2004 as visitors from any other nation. In 2004, out of a total of 2.866 million visitors, 931,246 were Americans. Other leading countries included Canada (448,627), France (300,009), Spain (228,035), and Germany (233,090) (Banco Central de la República Dominicana 2005).

Foreign direct investment presents a similar picture. The United States is the leading investor in the Dominican Republic but has less than half the share of the current capital flow into the DR. During the first half of 2004, for example, U.S. foreign direct investment of $131.1 million accounted for 38 percent of the $341.1 million total direct investment during the period (CEI-RD 2004). U.S. companies have major investments in Dominican free trade zone (FTZ) operations, which constitute one of the three pillars of the Dominican economy, along with tourism and immigrant remittances.

The Dominican Republic is also a stalwart political ally of the United States. The DR supports U.S. efforts to stem the drug trade and transnational crime, and recently enacted a law to help curb money laundering. In August 2003, the Dominican Republic dispatched 302 troops to Iraq, where they served until May 2004.

Immigration

In the last 20 years, with the exception of Mexico, no other country of the Western Hemisphere has had more immigrants admitted to the United States than the Dominican Republic, as shown in Table 1.

Table 1
Immigrants Admitted to the United States
FY 1981-2000
Leading Western Hemisphere Immigration Countries

	1981-1990	1991-2000	TOTAL
Mexico	1,655,843	2,249,421	3,905,264
Dominican Republic	**252,035**	**335,251**	**587,286**
El Salvador	213,539	215,798	429,337
Jamaica	208,148	169,227	377,375
Haiti	138,379	179,644	318,023
Cuba	144,578	169,322	313,900
Colombia	122,849	128,499	251,348

Source: U.S. Department of Homeland Security, *Yearbook of Immigration Statistics, 2002*, U.S. Government Printing Office: Washington, D.C., 2003.

As a result of the heavy flow of immigration and the natural increase of population (i.e., births minus deaths), the Dominican-origin population of the United States increased more rapidly than that of any other Latino group during the 1990s. Corrected U.S. Census data show that the Dominican-origin population of the United States doubled between 1990 (520,121) and 2000 (1,041,910).

Although this rate of growth almost certainly will not continue, it is likely that Dominicans will replace Cubans as the third largest Latino group in the United States sometime during this decade. Moreover, an increasing number and percentage of Dominican-origin persons residing in the United States are U.S. citizens by birth. This second generation, comprised of 394,914 individuals as of 2000, is growing rapidly and has significantly higher levels of educational attainment than the immigrant generation (Hernández and Rivera-Batiz, n.d.). Just beginning to enter the U.S. labor force in substantial numbers, this group of Americans of Dominican descent will have an increasing economic, political, and cultural impact on U.S. society, particularly in areas of high concentration such as New York City, other areas of the Northeast, Florida, and Puerto Rico.

Remittances are a major linkage between Dominicans living in the United States and their families at home. In the last decade, remittances received tripled, going from $721 million in 1993 to $2.06 billion in 2003 (Banco Central de la República Dominicana). The preliminary figures for the first nine months of 2004 indicate a further increase. Remittances contribute to the maintenance of hundreds of thousands of Dominican households, provide financing for small and medium-sized business, and are responsible for 25 percent of the country's foreign exchange, which is vital in maintaining the value of the currency and acquiring imported goods.

III. DOMINICAN PROMISE, DOMINICAN PERIL

In recent years, the Dominican Republic has demonstrated both a capacity for rapid political and economic progress and a vulnerability to sudden and unexpected reversals. This susceptibility to "tipping points"—perhaps not surprising for a developing country that has experienced significant population growth and demographic change over the past half century—is evident in current environmental trends, relations among Dominicans and Haitians, and even the nation's prospects for sustained economic growth.

Environmental Trends

The status of environmental stewardship in the Dominican Republic can be evaluated from two contrasting perspectives, with Haiti often the reference for comparison. "We are destroying our environment today faster than the Haitians destroyed theirs in the last century," a scholar and environmentalist told us. Most of the Dominican environmental experts we interviewed, even those who are optimistic about the future, told us that right now the trend toward environmental degradation is proceeding at a faster rate than the rate of environmental protection or restoration.

The case of those who look with apprehension at the environmental situation in the Dominican Republic was bolstered by the release of the *2005 Environmental Sustainability Index* (ESI). It ranked the Dominican Republic 119 out of 146 nations on the ESI. In Latin America and the Caribbean, only Trinidad and Tobago at 139 and Haiti at 141 ranked lower (Esty et al. 2005).

Conversely, the comparison with Haiti can breed complacency because, when viewed in contrast with the disastrous environmental condition of Haiti next door, the DR looks quite good. In his recent book, *Collapse*, Jared Diamond has written about the fact that 28 percent of the Dominican Republic is still forested, while there is only 1 percent of forest cover in Haiti visible to the naked eye:

"From an airplane flying high overhead, the border looks like a sharp line with bends, cut arbitrarily across the island by a knife, and abruptly dividing a darker and greener landscape east of the line (the Dominican side) from a paler and browner landscape west of the line (the Haitian side). On the ground, one can stand on the border at many places, face east, and look into pine forest, then turn around, face west, and see nothing except fields almost devoid of trees" (Diamond 2005).

In a sense, both views are correct. The environmental conditions in the Dominican Republic and Haiti are vastly different from each other today. But whether that will still be the case tomorrow is less certain; many of the trends in the DR in relation to water and soil conservation, marine and coastal protection, and other environmental variables are moving in the wrong direction.

The situation regarding agriculture reflects both the contrast between a developing DR and a stagnating Haiti and the peril to the Dominican Republic's future development and stability posed by its current model of development. Although agriculture contributes a steadily declining

percentage of the Dominican Republic's GDP (10.6 percent in 2002), the sector still employs some 15 percent of the labor force (Economist Intelligence Unit 2004). Just as importantly, domestic agriculture provides most of country's staple food items, such as rice, plantains, and beans. The use of more intensive farming techniques and fertilizers has increased food yields by nearly 30 percent from the late 1970s to 2000 (World Bank 2001b).

The problem is that much of this progress is based on unsustainable practices that have resulted in soil erosion and salinization. A 1981 environmental assessment called soil erosion "the most serious problem affecting the natural resources of the Dominican Republic" (Hartshorn 1981). The two main culprits identified were hillside farming practices and deforestation. Government, NGO, and public-private efforts since the late 1980s apparently have reduced the rate of erosion in the country by supporting watershed management, soil conservation, and reforestation projects in critical areas (IRG 2001). Notwithstanding such progress, between 1980 and 1998, the amount of land identified as "arid, barren, or eroded" increased from 402 square kilometers to 1,302 square kilometers. That amounts to a 3.24-fold increase in unproductive land area in less than two decades. To put this in perspective, during this same period a huge urban boom was taking place in the Dominican Republic, and urban areas increased from 292 square kilometers in 1980 to 394 square kilometers in 1998, a 1.35-fold increase. Thus, wastelands expanded approximately two and a half times faster than urban areas in the Dominican Republic during the last two decades of the twentieth century. A new study of land use is needed to establish what has occurred since 1998 and the extent to which measures taken since the 1980s have managed to stop or slow land spoilage.

Irrigation has helped boost agricultural production during the last two decades, but it is also a major factor driving the increasing salinization of soils. Roughly 13 percent of Dominican cropland is under irrigation, with an increase of nearly 50 percent from 1980 to 1998 (IRG 2001; WRI 2003). Irrigation-associated problems, such as overuse of local water supplies, poor drainage from irrigation canals, and the reuse of irrigation tail water threaten soil quality in some of the country's most fertile regions by increasing the salinity of the soil and water. The problem is especially acute in some areas, such as in the lower sections of the Cibao valley, where only 21 percent of soils are classified as "not saline," compared with the upper sectors of the valley where 84 percent of the soils are so classified.

If agriculture, the traditional leading industry, is responsible for significant salinization of the rich agricultural soils of the Cibao valley, tourism, the new leading industry, is implicated in salinization of surface and ground waters in the country's coastal areas, particularly in the fast-growing tourist areas of the east. Underground water in this area is insufficient for the projected growth in tourist facilities and the increasing numbers of tourists and service workers. As water is pumped out of aquifers for use in landscaping, laundry, and human consumption, salt water filters down to the aquifer.

Although the amount of surface and underground water available in the Dominican Republic is currently sufficient, that might not be the case in the future. In at least one region, the future is now. In the Punta Cana/Bávaro area, hoteliers are predicting serious water problems within five to ten years. Yet, there are plans for a tripling of the hotel rooms in the area. But while there is an awareness of the growing scale of the water problem, the costs and technology involved in introducing effective long-term measures are prohibitive. Thus, remedial actions are not keeping page with the growth of the problem.

Table 2

FESS Environmental Security Vulnerability Index: Dominican Republic

	Indicator	Actual Value	Percentile Rank	Countries Covered	Warning Indicator
Land and Soil Quality	*Source: TERRASTAT of UN Food and Agricultural Organization (FAO)*				
	Percent of dry and desert land area	<1	8%	103	
	Percent of severely degraded land area	41	62%	86	
	Percent of steep land area	71	85%	102	✹
Water Quantity	*Source: AQUASTAT of FAO*				
	Total renewable (actual)(m^3/capita/year)	2507	78%	100	✹
	Internal renewable water consumed per capita per year (cubic kilometers per capita)	21	67%	101	✹
	Agricultural water use intensity in 2001 (cubic meters per hectare)	1404	40%	101	
	Groundwater recharge in 2004 (cubic meters per capita)	1318	59%	98	
Water Quality	*Sources: United Nations Statistics Division, Social Indicators and FAOSTAT of FAO, Means of Production*				
	% of population (total) using improved drinking water sources 2000	93	18%	100	
	% of population (rural vs. urban) using improved drinking water sources 2000	87	23%	101	
	% of population (total) using adequate sanitation facilities 2000	57	50%	100	
	% of population (rural vs. urban) using adequate sanitation facilities 2000	64	59%	99	
	Fertilizer consumption per hectare of arable land	56	66%	102	✹
	Pesticide use per hectare of arable land (Million tons (Mt) per 1000 hectare)	8.9	80%	21	✹
Forestry	*Source: FORTIS of FAO*				
	Total Forest as Percentage of Land Area (%) (2000)	28.4	56%	103	
	Consumption of solid biomass (including fuelwood) per capita (1000 Mt of oil equivalent or ktoe)	0.17	57%	80	
Energy	*Sources: World Development Indicators (WDI) and Earthtrends of World Resources Institute (WRI)*				
	Energy consumption of non-renewables per capita (1000 Mt of oil equivalent or ktoe)	0.6	50%	78	
	Fuel import as a % of total imports	23	89%	84	✹
Natural Disasters	*Source: Emergency Disasters Data Base/Center for Research on the Epidemiology of Disasters*				
	Total number of natural disaster deaths by country for 1990-2003	1183	28%	102	

The FESS Environmental Security Vulnerability Index (ESVI) ranks 103 developing countries across a variety of environmental and non-environmental indicators. A "warning indicator" is given for any case where a country falls into the bottom third of all ranked countries.

Trends in relation to forests are more complex and more positive than those concerning soil erosion and salinization. Originally, forests covered as much as 70 percent of the Dominican Republic. Deforestation began not long after the European discovery and proceeded slowly for centuries. It accelerated in the twentieth century, and especially during the latter decades. By 1967, deforestation had become so serious that President Joaquín Balaguer instituted a draconian crackdown by closing all sawmills, prohibiting logging, and turning enforcement over to the armed forces. Subsequent governments have recognized and reacted to the problem to varying degrees, but they have increased the number of protected areas and sponsored reforestation and natural resource management programs, such as the Plan Sierra and Quisqueya Verde.

Other government policies that have contributed significantly to decreasing deforestation have included subsidies on natural gas and cuts in tariffs for the importation of staples. Since Balaguer, the government's approach has shifted from a punitive one based on prohibition to a resource management approach based on individual incentives and sustainable forestry. Enforcement is now in the hands of a new Environmental Police unit under the ministry of the environment.

Quantifying changes in forest cover in the Dominican Republic over time is complicated by the fact that the different studies have used different methodologies. It does appear, however, that the process of deforestation, which had been rampant, began to decrease around 1980 and has been slightly reversed since that time. The most impressive achievement came in relation to coniferous forest cover, which increased tenfold between 1980 and 1990 as a result of vigorous reforestation efforts. However, the overall increase in forest cover between 1980 and 1998 was a mere 1.1 percent. The conclusion seems to be that, roughly speaking, continuing deforestation and vigorous recent reforestation efforts have cancelled each other out. In relation to forests, the Dominican Republic appears to be running very hard, and devoting great energy and scarce resources, just to stay in the same place (IRG 2001;WRI 2003).

The situation in regard to marine and coastal management is less positive. Tourist development and urban and agricultural runoff are putting increasing stress on fragile wetlands, mangroves and reefs, and there is much anecdotal evidence of overfishing. In particular, reefs, key both to protection from natural hazards and to the tourism industry, have incurred substantial damage. The restoration of reefs is a slower and more laborious process than reforestation.

If the Dominican Republic is managing to hold the line on deforestation—if only barely—and losing the battle along the coasts and under the sea, the environmental problems resulting from the country's breakneck urbanization are outpacing the state's capacity to respond. For instance, while the percentage of the rural population with access to improved sanitation has improved from 71 percent in 1990 to 78 percent in 2000, the percentage of the urban population with such access actually declined from 92 to 90 percent over that same time period (IRG 2001;WRI 2003).

Beachfront in Santo Domingo.

In summary, the Dominican Republic still has time to prevent a disastrous environmental decline such as has befallen its neighbor. The country has made some significant progress, especially in curbing deforestation. But that partial victory has come at a relatively high price in resources and energy. And efforts to stop soil erosion, salinization, and coastal and marine degradation have not yet succeeded, nor has the effort to provide sanitation to the rapidly increasing urban population produced significant advances.

Demography, Economic Change, and Dominican-Haitian Tensions

For more than four centuries, the Dominican Republic was an overwhelmingly rural society, based on an agrarian economy, with a tradition of autocratic rule. However, since the middle of the twentieth century and, especially, since the end of the dictatorship of President Rafael Trujillo in 1961, the country has been undergoing a profound and remarkably rapid transformation.

Until the last third of the twentieth century, Dominican families were large and organized around traditional roles. The society was patriarchal and political rule was authoritarian. Trujillo, the latest and most feared in a long line of caudillos and dictators, also was responsible for some of the early development of the nation's infrastructure and industry. However, he also monopolized the country's economy, severely restricted the rights of Dominicans, including the freedom of speech and travel, brutally repressed political adversaries, and committed genocide against Haitians living on the DR-Haiti border.

Population data suggest the pace and scale of changes in Dominican Republic in the last half of the twentieth century. During the 1950s and 1960s, a high birth rate characteristic of rural Latin America propelled annual population growth at the rate of just over 3 percent and set the stage for a 355 percent increase in the population between 1950 and 2000. Since 1970, urbanization, increased education, and other changes have led to sharply decreasing birth rates that have

produced significant drops in the rate of population growth, despite increasing levels of life expectancy. The growth rate in 1990-2000 was slightly over half the rate for 1950-2000 and is expected to decrease further in coming decades.

Table 3
Population Estimates and Average Annual Period Growth Rates:
1950 to 2050
(Population in thousands, annual growth rate in percent)

YEAR	POPULATION
1950	2,353
1960	3,231
1970	4,423
1980	5,697
1990	7,076
2000	8,354
2010	9,521
2020	10,625
2030	11,644
2040	12,573
2050	13,425

PERIOD	GROWTH RATE
1950-1960	3.2
1960-1970	3.1
1970-1980	2.5
1980-1990	2.2
1990-2000	1.7
2000-2010	1.3
2010-2020	1.1
2020-2030	0.9
2030-2040	0.8
2040-2050	0.7

Source: U.S. Census Bureau, International Data Base, Projected figures for years 2010-2050.

To put the Dominican Republic's population growth rates in perspective, during the period (1950-2000) in which the DR grew by 355 percent, the U.S. population increased by 185 percent, Cuba's by 192 percent, Puerto Rico's by 172 percent, and Haiti's by 236 percent. The growth of population in the Dominican Republic during the last five decades was considerably faster than almost all of the countries of the hemisphere, including its Caribbean neighbors.

Taken together, the Dominican Republic and Haiti grew from a combined 1950 population of 5.4 million to 15.7 million in 2000. In 1950, Haiti's population was almost a third larger than Dominican Republic's. By 2000, the DR's population was more than 20 percent larger than Haiti's. However, Haiti is expected to grow faster than the Dominican Republic during the next five decades and is projected to have a population of 18.4 million by 2050 compared to 13.4 million for the Dominican Republic. This implies than in 2050 Hispaniola will have almost three times the population of Cuba in about two-thirds the land.

The Dominican Republic today is an increasingly urban society with a declining although still important rural population. By 2002, 58.9 percent of the population was urban, a figure expected to increase to 64.6 by 2015 (UNDP 2003). Rural to urban migration reflects very large differences in living conditions. According to a Dominican government study, the rate of poverty in rural areas (70.4 percent) is more than twice as high as in urban ones (29.9 percent) (Tejada Holguín 2002, 31) Other studies have found smaller urban-rural differences in poverty. What is clear is that employment opportunities and access to medical care, education, clean water, and sanitation are significantly greater in the urban areas, especially Santo Domingo, than in the countryside.

The movement of the population from the countryside to the cities has been accompanied by major shifts in the structure of the nation's economy. The trinity of agricultural export

commodities—sugar, coffee, and tobacco—that long had been the backbone of the economy has been replaced by a new triad: tourism, free-trade zones, and immigrant remittances.

Table 4
Percent of Value of GDP by Economic Sector
1970 v. 2003

ECONOMIC SECTOR	1970	2003
Agriculture, Cattle, Fishing	23.2	11.3
Mining	1.5	1.5
Sugar manufacture	5.1	0.6
Other manufacture (except free trade zones)	13.4	15.2
Free trade zones	0.0	2.6
Construction	4.9	11.5
Trade	5.5	11.3
Hotels, Bars, Restaurants	0.5	8.0
Transport	7.0	6.0
Communications	0.7	9.7
Electric and Water	1.2	2.3
Finance	1.8	3.9
Housing	6.7	3.9
Government	10.2	8.2

Source: Banco Central de la República Dominicana http://www.bancentral.gov.do/index.asp

The country's economy has been growing steadily since World War II, with the exception of a few relatively short recessions. There has been substantial expansion of the middle class through employment in growth sectors such as trade and finance. But the transition from an agricultural economy to an economy based on services and light manufacturing also has been accompanied by large-scale unemployment, underemployment, and informal employment. The jobs created by the growth sectors of tourism and free-trade zones are overwhelmingly low wage.

These economic variables are the drivers for legal and illegal large-scale international migration destined mostly for the United States. International migration, a reflection of the country's economic deficiencies, also has become an important source of national income through remittances.

Table 5
Annual Remittances 1993-2003

YEAR	TOTAL REMITTANCES (in millions USD)
1993	720.6
1994	756.7
1995	794.5
1996	914.0
1997	1088.9
1998	1326.0
1999	1518.7
2000	1689.0
2001	1807.8
2002	1959.6
2003	2060.5

Source: Banco Central de la República Dominicana

Dominicans, once confined to their country by the Trujillo dictatorship, have become a highly mobile people. In recent decades, vast migration from rural areas has greatly increased the population of the capital and fed the growth of Santiago, the country's second largest city.

The numerical growth of the Haitian-origin population and its increasing incorporation into new sectors of the labor force in the Dominican Republic is an important factor in the Dominican Republic's economy and society. Historically, relations between the Dominican Republic and Haiti have been complex and troubled. Alongside a history of warfare, conquest and conflict, there is a history of contact, communication, commerce, and cooperation, especially along the Haitian-Dominican border.

The simultaneous U.S. occupation of Haiti and the Dominican Republic in the late 1910s and early 1920s facilitated the substitution of Haitian labor for West Indian and Puerto Rican workers. Concentrated in the sugar industry until the 1960s, in the 1970s Haitian workers began to take part in the coffee harvest. The trend toward the expansion of Haitian labor niches has continued, and Haitian workers have become a structural component of the labor force in the Dominican Republic in such sectors as agriculture, construction, and the landscaping of tourist facilities.

The number of Haitians in the Dominican Republic has been estimated at one million or higher. According to the leading social science research organizations in the Dominican Republic, such figures are exaggerated, judging by the scant evidence available (FLACSO 2004). Arriving at an accurate number is difficult if not impossible, however. The majority of Haitians are undocumented, and such populations are notoriously difficult to count. Moreover, Haitians move frequently between the Dominican Republic and their own country so that the number of Haitians in the Dominican Republic is subject to fluctuations. Finally and most importantly, the issue of the number of Haitians in the Dominican Republic depends on the definition of citizenship and nationality. In effect, there are tens or hundreds of thousands of individuals of Haitian descent born in the Dominican Republic, and there is no consensus of whether they should be counted as Dominicans, Haitians, or binationals.

Whatever the precise number, it is clear that the Haitian presence is growing and becoming more deeply integrated in the Dominican Republic's labor force and that, given the two nation's conflict-laden history, a significant number of Dominicans see such trends as ominous. Haitians

make important contributions to the economy of the Dominican Republic and enrich the nation's culture. But, like immigrants elsewhere, they pose significant challenges to national identity and are frequently the focus of ethnic conflict and the objects of prejudice and discrimination. Recent surveys have shown that, even in the border region—an area of substantial contact, communication, and cooperation—a disturbingly high percentage of Dominicans harbor prejudices and animus against Haitians (FLACSO 2004).

Aside from these attitudes, the Haitian population in the Dominican Republic, over 75 percent of which is male (of which almost two thirds is under thirty), poses critical challenges in relation to such social problems as prostitution and HIV/AIDS. In the long run, Haitians in the Dominican Republic, the majority of whom have less than an eighth-grade education and are unable to read and write Spanish, raise important issues of integration.

On balance, most societal trends in the Dominican Republic during the last 45 years have been positive. The economy has grown dramatically, while the rate of population growth has decreased significantly despite lower infant and total mortality. Levels of education have increased. Democracy has taken hold and is in the process of being consolidated. Urbanization has brought with it a plethora of problems but also expanded opportunities. Dominicans today have much greater freedom to choose their leaders, organize and express themselves politically, and travel abroad than ever before. While Trujillo once virtually monopolized business, today there is a fairly wide field for entrepreneurial activity.

Yet there are also significant perils, including the fragile nature of the pillars of economic development, the persistence of corruption, the economic exclusion of a large percentage of the population that has not benefited from economic growth, and the political and cultural exclusion of a growing population of Dominicans of Haitian origin. Neither basket case nor successful model, the stability and security of the Dominican Republic is not yet fully assured and can be substantially influenced by the actions of the country's people, its leaders, and its friends.

Democracy, Corruption, and Debt

Dominican democracy has experienced uneven progress since the assassination of President Rafael Trujillo brought an end to his 31-year dictatorship in 1961. Despite regular, if not necessarily fair elections and rapid economic growth, the 12-year presidency of Joaquín Balaguer (1966-1978) was marred by authoritarianism and violations of human rights. The victory of the opposition PRD party in 1978 was a watershed in the process of transition to democracy.

However, the reality and/or perception of electoral fraud continued to plague the Dominican Republic. The issue came to a head in 1994, when Joaquín Balaguer claimed victory, and the opposition refused to recognize a result widely perceived as fraudulent. An agreement was reached through mediation that led to a two-year term for Balaguer, without the possibility of re-election. The 1996 election, which brought a new party (PLD) and a young leader (Leonel Fernández) to power, generally was recognized as free and fair.

By the late 1990s, the Dominican Republic not only boasted a democratically elected government, a relative rarity in the country's history, but also the highest economic growth rate in all of Latin America. Some students of the country's history spoke of a Dominican miracle.

Table 6
Percent Annual Change in GDP
Dominican Republic 1990-2004

YEAR	% GDP PER CAPITA (in million USD)
1990	-12.4
1991	32.0
1992	16.3
1993	6.4
1994	8.4
1995	10.1
1996	9.2
1997	11.0
1998	3.5
1999	7.6
2000	11.5
2001	7.9
2002	-1.7
2003	-23.7

Source: Banco Central de la República Dominicana

Yet, there were problems that worked to undermine that apparent miracle, including the fact that the fruits of economic growth were not widely shared and the continuing evidence of political corruption (World Bank 2001a).[3] With Fernández unable to run for re-election, the PRD's Hipólito Mejía won the 2000 election over the PLD candidate in a landslide.

The outlook appeared optimistic during the early Mejía administration, but several troubling fiscal and economic developments produced a sudden downturn after April 2003.[4] The precipitating event was a colossal scandal involving the BANINTER banking group, whose principal figures had ties to the Mejía administration, and the subsequent massive government bailout of investors. The Dominican economic miracle ended virtually overnight and turned into a nightmare over the next two years, as the value of the peso plummeted and along with it the purchasing power of salaries and pensions. In 2001, the exchange rate of the peso against the dollar averaged just under 17. By early 2004, it approached 50, leaving the value of the Dominican currency just slightly over a third of what it had been just over two years before.

Government debt, foreign and domestic, skyrocketed, and agreed-upon IMF targets for budget deficit reduction were repeatedly missed. The fiscal crisis led to an economic crisis as growth rates turned negative and seriously aggravated the DR's perennial electricity problems. GDP per capita decreased by 25 percent between the end of 2001 and the end of 2003. The country was in arrears on the payment of foreign debts, and a general default loomed as a real possibility. Chronic blackouts plagued the country, in some areas lasting 18 hours a day. Political and social discontent mounted as the presidential election of 2004 approached.

This was the context of the presidential elections of May 16, 2004, which returned Leonel Fernández of the PLD to power in a landslide victory over the incumbent Mejía. With good reason, the Economist Intelligence Unit described the challenges faced by the new administration as "daunting." These included intertwined economic, fiscal, debt, and electricity crises and high popular expectations of a return to the halcyon days of the Dominican economic miracle.

On August 16, 2004, Leonel Fernandez took office, and soon thereafter initiated a number of concrete measures to improve the fiscal and economic situation. The most important of these was an increase in taxes in order to increase revenues in the context of a governmental liquidity crunch. The tax measures included an increase from 12 percent to 16 percent in the VAT, an increase in tobacco and alcohol excise taxes, and a reduction and retargeting of liquefied gas and electricity subsidies. A reduction in government payroll, a difficult task politically as PLD party members clamored for the spoils of their recent victory, was also instituted to cut the deficit.

By January 2005, the consensus of economists, international financial institutions, and Dominican public opinion was that the situation had improved markedly. The exchange rate against the dollar had dropped to approximately 30 to 1, a nearly 40 percent increase in value from the low point in 2004. Inflation and the interest rate had also been substantially reduced. Blackouts were less lengthy and frequent. Net reserves, which had been increasing during the final months of the Mejía government after having dropped severely, continued to increase after the turnover of power. Net international reserves were $123.6 million in December 2003 and $602.2 in December 2004, nearly a five-fold increase in one year (Banco Central de la República Domincana). Debt payments had been made to the Paris Club (developed country creditor governments), and a 24-month standby agreement with the IMF was signed on January 31, 2005. The IMF agreement also was to trigger significant funds from the World Bank and the Inter-American Development Bank.

If it can be reasonably concluded that the Fernández government succeeded in a "rescue operation" to bring back the Dominican economy from the brink, there remain enormous hurdles on the way to a sustained recovery and a return of the growth rates of the late 1990s. The consolidated foreign debt of the Dominican state and the debt of the Central Bank grew dramatically in 2003 as a result of the economic crisis and the government bailout of three failed banks. Between December 31, 2002 and December 31, 2003, for instance, the foreign debt grew by almost a third, from $4.54 billion to $5.97 billion. The burden of repaying the debt will weigh on the Dominican Republic for many years.

Looking still further down the road, the main growth pillars of the Dominican Republic each face significant challenges. Tourism, perhaps the linchpin of the DR's economy for the future, is vulnerable to natural disasters, and the current mass-market tourism model raises serious questions about environmental sustainability. The DR's free trade zones, which had been a growing source of employment in recent years, appear to have hit a plateau and face Chinese competition starting in January 2005 as import quotas under global trade rules have expired. The FTZs are now expected to lose 15,000 jobs over the next few years. Immigrant remittances can continue to grow for some time but not indefinitely, as the number of Dominican immigrants admitted to the United States annually has been significantly lower over the last five years than the peak of the 1990s, and deportations of Dominicans have increased sharply since the mid-1990s.

Unless wide disparities in economic opportunities can be moderated, even a return to sustained growth does not guarantee a marked reduction in poverty or the elimination of the potential for social and political instability. The government relies on consumption taxes rather than income taxes for 70 percent of revenues, and the latest changes in the tax system reinforce this dependence, which disproportionately affects lower income groups. The Dominican Republic has lower levels of human development and higher infant mortality rates than the average for other countries at the same level of GDP (UNDP 2004).

As the experience of the late 1990s shows, the Dominican Republic has the promise of sustained economic growth under democratic governance. At the same time, the crisis of 2003-2004 indicates the country's vulnerability. That crisis appeared increasingly under control as of early 2005, but the damage perpetrated even by this apparently short-lived event suggests that the margin between success and failure in the Dominican Republic is not large. If another crisis were to emerge and intertwine with other variables, such as the spillover of troubles in Haiti, a series of major natural disasters, or sustained environmental decline in the tourist sector, the DR's security could be imperiled.

IV. INSTITUTIONAL WEAKNESS

In analyzing the environmental problems and risks related to land degradation, water quality and quantity, coastal and marine decline, deforestation, and energy shortages in the Dominican Republic, at least two basic questions present themselves: 1) How did these problems get to be in their current state? and, 2) How can we explain similar negative outcomes in such diverse problem areas?

Both questions, of course, have a variety of historical and issue-specific answers, but at the core of many problems in the Dominican Republic, including many of the difficulties relating to environmental policy and the use of natural resources, is the weakness and ineffectiveness of Dominican institutions. As Shahid Javed Burki and Guillermo Perry have written, "Institutions are *rules* that shape the behavior of organizations and individuals in a society. They can be formal (constitutions, laws, regulations, contracts, internal procedures of specific organizations) or informal (values and norms)" (Burki and Perry 1998). The absence of rules, low rates of compliance with existing rules, and the limited capacity (or will) to enforce rules both reflect and reinforce social values and norms that undermine the efficient and sustainable use of the Dominican Republic's considerable natural endowment. Combined with persistent episodes of corruption—the abuse of public trust for private gain—the corrosive effects of institutional weakness are present across a wide array of issue-areas critical to the environmental security of the Dominican Republic. As discussed before, five key issue-areas affected by these problems are environmental governance, the provision of electricity, preparation and response to natural hazards, land use management, and unsustainable practices in agriculture and tourism.

Environmental Governance

Legal and Regulatory Frameworks

The Dominican Republic does have a general or framework law on the environment, similar to ones in other Latin American countries, that enables a core environmental regulatory institution (in this case the Secretariat of Environment and Natural Resources, or SEMARN) to oversee the design and implementation of a regulatory regime covering most major environmental issues, such as air and water quality, pollution control, habitat and species conservation, protected areas, and environmental impact. The law, No. 64-00, went into effect in August 2000.

The drawback to the general legislative approach is that it defers the details in most critical areas until specific legislation (referred to in the DR as "sector laws") is enacted or to the development of norms through working of the regulatory process. A range of factors, including economic pressure, partisan bickering, political corruption, and the lack of political will and/or technical capacity, can derail or delay the implementation of specific and effective environmental rules.

Until August 2004, the development of norms and sector laws proceeded, but without a strong strategic vision, as SEMARN followed priorities that were not always clearly enunciated or well justified. The Secretariat had a great deal of support and guidance from donor agencies and international consultants, but there was an "absorptive capacity" issue in SEMARN's ability to integrate this support. In addition, SEMARN's leadership (notably the minister of the environment) did not place a high priority on strategic planning. One of the first norms to be developed under Law 64-00, for example, was a noise ordinance—a concern that bore little relation to priorities identified by professionals inside SEMARN, and one that was both technically and, to significant degree, culturally, difficult to tackle.

An example of SEMARN's sometimes crisis-driven agenda was a decision to draft a coastal zone management norm at a time when several different groups of investors had proposals pending to build coastal resorts (including a proposed resort and yacht harbor along a sensitive coastal area that would require dynamiting coral reefs to facilitate navigation). The developers were pressing for environmental impact permits (called for in Law 64-00) so they could proceed, and the Secretariat determined that the coastal zone norm should move to the top of the priority list. While many of the scientific and technical professionals within the Secretariat certainly would have identified a coastal zone management norm as a high priority, the timing was driven by political and economic factors that did not contribute positively to the result. This style of operating also disrupted any sense of routine by pulling staff away from other projects to which they later returned.

The change of administrations in August of 2004 has brought renewed hope for SEMARN and its regulatory agenda—particularly in the area of strategic planning. The new minister, who has the benefit of working under an administration more inclined toward institutional development than the former one, has identified the preparation of draft sector laws on Biodiversity, Coastal Marine Resources, and Forestry Resources as top priorities in the near term, and work is underway in all three areas. The Secretariat still faces a number of key hurdles in the development of these drafts, and its professional staff will be challenged to manage the process effectively. In addition, the drafts must move through the legislature, where history suggests that political will and political influence may present additional hurdles. Yet, a sense of purpose and vision is welcomed at SEMARN and bodes well for progress in furthering the regulatory framework.

Sociocultural Legitimacy

Informal reports from a range of informants suggest that many in the regulated community in the Dominican Republic do not hold conformity with environmental laws and regulations as a key personal, professional, or social value. In fact, the economically powerful have tended to act in their own economic interests, and they reportedly have the power and the inclination to ignore inconvenient regulatory regimes, and/or purchase loyalty and support when needed.

Government service is not seen as a profession to which elites would aspire, and there is a tendency to view government workers as either corrupt or incapable of finding work in the "productive sector" (or both). This is not a universal view, and many recognize the value and talent of government employees, but it is sufficiently present to influence compliance behavior. Government employees are not well rewarded financially, nor well supplied in their work (note, for example, that most SEMARN employees use "Yahoo" web addresses or the equivalent rather than government accounts), and they often report that supervisors do not keep them informed or respect their need for professional training. SEMARN certainly has a number of talented and dedicated employees, but their number and their training is not yet adequate to the task of building, monitoring, and enforcing a modern and sustainable environmental framework.

In general terms, it would be difficult to argue that state environmental policies and legal frameworks have a great deal of sociocultural legitimacy or acceptance in the public at large, in significant populations or communities, or in regulated communities. On the other hand, environmentalists at times have sufficient access to the media and public support to raise an outcry at critical junctures, for instance against the recent attempt to decimate Protected Areas (see below).

Institutional Structure, Capacity, and Integrity

Reporting relationships and institutional structures have improved since the new administration entered office in August 2004, but the capacity issues noted above still persist, and the corrupting influence of key actors in the regulated community are noteworthy. Perhaps the most critical structural issue is the failure, to date, to establish a meaningful coordination mechanism among the various government agencies that have some competence over environmental concerns. Tourism, in particular, is an area of critical environmental concern where SEMARN faces jurisdictional competition—and where it is frequently outgunned or outmaneuvered. Agriculture is another area where SEMARN lacks the political power and economic importance of its governmental counterpart. Whether and how the new Tourism Cabinet will affect the power relations between the ministries is an open question.

Law 64-00 provides an institutional mechanism to begin addressing this issue. The law authorizes an "Environmental Council" to be chaired by the minister of the environment and to include other cabinet level ministers and secretaries as well as non-governmental actors. While such a Council will not change underlying power relationships, it does present the prospect of a forum for negotiating and resolving disputes where reasoned dialogue might build allies for SEMARN's agenda. The prior administration never acted on the law to convene the Council, but the new minister has affirmed his strong interest in building and using the mechanism. This would be a very positive step from a governance standpoint.

A notable example where institutional integrity has been the subject of heated public debate is the case of a sector law on Protected Areas, which was prepared and enacted during the final days of the previous administration. The law was prepared after adequate public debate and input, but the outgoing minister reportedly made changes that significantly weakened the law at the last minute (restricting or limiting areas that had been identified to be protected) before it was submitted to the legislature. The lawmakers added their own changes—further weakening the law. This led to cries of foul by environmentalists, and even the incoming environment minister disavowed the new law. A coalition of environmentalists challenged the law (with the informal but public support of SEMARN) and recently lost their challenge in the Supreme Court. SEMARN is considering options to recapture some of the lost authority to protect sensitive areas in the context of a draft law on Biodiversity that it is currently developing, and has reportedly been authorized by the president to draft a new Protected Areas law for submission to Congress. But the incident has done little to build public trust in the system or to reinforce a sense of pride and professionalism among environmental public servants.

Public Access and Local Governance

In the mid-1990s, the Dominican Republic experimented with an extensive program of public consultation on a broad range of environment and development policies. The program was later criticized (including within SEMARN) as having been long on talk and short on action. Officials in the last administration made a point of saying that they would promote dialogue, but not at the expense of results. In fact, in most cases, the development of sector laws and norms was attended by public consultations and public input—although the dialogue tended to be late in the process (after officials and experts had prepared drafts), and participation tended to favor affected

economic sectors (the potentially regulated) over nongovernmental organizations (environmental or watchdog groups).

It should also be noted that environmental groups in the DR are themselves still in the process of development. There are few full-time professional advocates, and many of those that do exist are trying to define their role as adversaries, advocates, or consultants. At the same time, when viewed in comparative perspective, the Dominican environmental movement is more advanced than similar movements in many other small developing nations.

The Electricity Crisis

There have been recurring "electricity crises" of diverse origins and degrees of severity in the Dominican Republic for more than two decades. The electricity problem in the Dominican Republic is a complex one that owes as much to social, institutional, and cultural factors as it does to financial and technical variables. Because the modern Dominican state inherited the electricity sector as a state monopoly from the Trujillo dictatorship, electricity problems in the Dominican Republic are inherently political. Electricity crises can and often have generated popular protests and even violent unrest, threatening the survival of governments and the stability of the state.

Four decades of rapid population growth, increasing urbanization, import-led industrialization, and rising expectations among both an emerging middle class and the poor majority are the context in which the Dominican Republic's perennial electricity crisis developed and has persisted. For most of this period, one fundamental problem was that the demand for electricity exceeded the installed generating capacity, and growth in capacity failed to keep up with demand.

Providing electricity has been a complex challenge in the Dominican Republic.

The institutional and political framework that defined the electricity sector in the Dominican Republic vastly compounded these problems. The politics of electricity, especially under the various Balaguer governments that ruled for most of the last third of the twentieth century, were a combination of populism, clientelism, and crony capitalism, with a healthy dose of outright corruption. The state greatly expanded access to electricity, subsidized the service, and tolerated illegal hook-ups, in no small part as a strategy to gain political support or to reward partisans of the ruling party. Major business interests allied with the regime or involved in corrupt relations with key sectors of the government were allowed to use electricity at little or no cost. The Corporación Dominicana de Electricidad (CDE), the state electric company, was a plum for favored politicians and a source of jobs for adherents of the party in power, leading to inefficient management. Beyond the incapacity of large sectors of the population to pay the real cost of electricity, a culture developed that viewed electric power as a public good that the state should provide for free.

The result of this perverse political economy of electricity was that the electric bill became a financial black hole for the Dominican state (absorbing as much as 20 percent of the budget) that often turned into a political black hole as a result of economic downturns, fiscal crises, increases in the interest rate, or spikes in the price of oil. Frequent blackouts resulted, leading to popular protests, increased resistance to paying for electrical service, and loss of political support for the government in power.

As part of a larger effort to modernize the state and as an attempt to tackle the permanent electricity crisis, the first Fernández administration (1996-2000) carried out a partial privatization

under the rubric of "capitalization." Capitalization was a compromise between privatizers and state-ownership defenders. Under capitalization, the government kept 50 percent of the shares, and 50 percent was offered to the private sector. The government auctioned its shares and formed two new generation and three distribution entities regulated by capitalization contracts. Hydroelectric generation and the transmission grid remained as separate units managed by the CDE.

The reform's objective was to restructure the electricity sector in order to create a more competitive market in power generation and to promote investments to improve the system's infrastructure. In 2001, the General Law of Electricity was promulgated. The Law focused state functions along policymaking, regulation, supervision, and promotion lines by establishing three new institutional bodies: the National Energy Commission (policymaking), the Superintendencia de Electricidad (regulation), and the Coordinating Body (coordination and planning).

The reforms scored some significant initial successes. Capitalization opened the electricity sector to investment by European and US firms, attracting about US$1 billion in direct foreign investment. Between 1995 and 2001, the power sector accounted for 35 percent to 40 percent of all foreign direct investment in the DR. This process significantly increased installed generation capacity, which grew from less than 2000 MW in 1998 to more than 3000MW in 2004. This essentially resolved the electricity deficit resulting from the gap between generating capacity and demand; if the financial deficit problems could have been resolved, the country would have had enough power capacity to efficiently supply current demand and to drastically diminish or end blackouts. On the transmission side, the Electricity Law created a transmission company and a more competitive transmission market with participants from the United States (30 percent), Spain (30 percent), Germany and France (30 percent) and others (10 percent). Increasing investment toward the transmission side of the electricity sector is critical to efficient supply. Partial privatization also improved the financial picture, allowing for the financing of the current account deficit and allowing the partial transfer of real costs to consumers. Under private distribution management, an increasing number of consumers paid their electricity bills, and rate increases allowed for a short period of financial recovery and reduction in government subsidies.

The 1999-2003 reforms were undertaken by a modernizing government in the context of a prolonged period of outstanding economic growth. Despite the accomplishments of the reform, many of the system's weaknesses, including massive reliance on oil imports and the social and political demand for large government subsidies remained. These and other accumulated problems resurfaced with a vengeance under the latter phase of the populist government of Hipólito Mejía (2000-2004). Rising oil prices, the international economic downturn, the effect of 9/11 on tourism, the effects of the banking crisis in 2003, and the populist politics of the Mejía administration produced a near-perfect storm that ultimately proved the undoing of his government.

The government's failure to pay the distribution companies led to frequent and prolonged blackouts, triggering popular discontent. Relations between the state, the distribution companies, and the electricity generators became increasingly strained, until the Mejía administration bought Unión Fenosa and switched distribution ownership back to the state in September 2003. This failed to resolve the problem of blackouts, while increasing the fiscal crisis of the state and the political costs to Mejía, who suffered a crushing defeat at the hands of Fernández in the elections of 2004.

The Fernández administration sought to tackle the immediate crisis of supply by beginning to pay the state's debt to the generators, while looking to resolve the mid-term financial problem by

phasing out subsidies and increasing collections. According to the Superintendent of Electricity, Francisco Méndez, the current annual financial deficit of the electricity sector is $650 million (El CaribeCDN.com 2005). The government's goal is to reduce that deficit to $350 million in 2005 and eliminate it in 2006. In order to accomplish that, Méndez indicated there needs to be "a hunt without quarter" against those who fail to pay for electricity. He indicated the electricity distribution companies were receiving payment for only half the kilowatts provided. Other analysts interviewed for this project have stated that three-fourths of such non-payments are accounted for by industrial users and one-fourth by illegal connections, the latter mostly done by the poor. Méndez stated the government is considering a total privatization of the electricity distribution companies or establishing management contracts with private sector companies to manage distribution.

In the context of the multifaceted crisis the current government inherited from the previous administration, it is understandable that Fernández is concentrating on short- and mid-term solutions. But while these moves, if successful, may address the acute condition and stabilize the situation in the medium term, resolving the electricity crisis over the longer term calls for the exercise of significant political will in order to effect major policy and management reforms to change the political economy of the electricity sector. It will require the government to confront powerful business interests, ensure the integrity and effectiveness of the judicial system in prosecuting fraud and theft, reduce gradually the subsidies provided to a vast political constituency of poor people through more universal collection and partial or total privatization, invest in the maintenance and modernization of the electricity infrastructure, and begin a serious push to develop alternative sources of energy. This is a daunting task, but a necessary one for the future development and stability of the Dominican Republic. President Fernández himself has stated that, left unresolved, the electricity crisis has the potential to throw the country into social turmoil. The current administration, given its modernizing orientation and high public approval, and with the encouragement and assistance of friends, is in a better position to undertake such a challenge, than most Dominican governments of the recent past.

Natural Hazards

As a Caribbean island located in an area of seismic activity, the Dominican Republic is vulnerable both to major hurricanes and serious earthquakes. Natural disasters have obvious implications for human security and can seriously set back development efforts.

The connection between natural disasters and national security is somewhat less obvious and direct but real. Government preparedness or the lack of effectiveness and integrity in managing an emergency can have serious political implications. For instance, in Nicaragua, the Somoza regime's mismanagement and corrupt handling of relief after the 1972 Managua earthquake helped set off a chain of events that eventually led to the overthrow of the regime and the triumph of the Sandinistas.

Infrequent and unpredictable future events, such as natural disasters, seldom command the same level of sustained attention and resources as urgent or frequently recurring problems. But lack of planning, prevention, and preparedness can greatly increase the human and material costs to be borne by populations, national governments, and international donors. It should be noted that in addition to the toll on the Dominican population, natural disasters in the Dominican Republic inevitably impact American tourists and the families of Dominican Americans residing in the DR.

The toll hurricanes and other natural disasters have taken in the last 25 years have made Dominicans increasingly conscious of the need to implement measures to protect the country from the potential for serious damage as a result of natural hazards. Even in highly developed

countries with effective mitigation plans in place, natural hazards can have huge impacts. For example, in August 2004, Hurricane Charley struck the coast of Florida and reportedly caused power outages in the homes of over one million people and damages estimated at $11 billion for insured homes alone (Breed 2004). But, in Florida, even such a powerful storm as Andrew produced relatively few deaths. In contrast, when Hurricane Georges hit the Dominican Republic in September 1998, it left hundreds of people dead, tens of thousands of people homeless, and caused widespread damage to the country's infrastructure. The cost of the hurricane was estimated to be roughly US$3.3 billion (USAID 2002), with eyewitnesses noting that the hurricane damage was so severe it was "as if a massive napalm attack had leveled the country" (White 1998).

In recent years, the Dominican Republic has improved its capacity to respond to natural disasters. The creation of a National Emergency Commission chaired by the Director of Civil Defense to coordinate the activities of the relevant government agencies and other organizations has been an important step forward. "Before, when we had a hurricane, we had two disasters; the first disaster was the lack of coordination, with the police saying one thing, another agency saying another," a director of a Dominican NGO told us, adding that the establishment of the National Emergency Commission largely has resolved this problem. The Commission is involved not only in response but also in preparedness, including monitoring the development of tropical storms in the region that could threaten the country. With the rapid development of civil society in recent years, NGOs focusing on disaster mitigation efforts also have supplemented the work of government agencies.

Despite the improvements in coordination, the system for dealing with natural hazards continues to be deficient, especially given the degree to which the Dominican Republic is threatened by natural hazards and their potential impact on the country's economy and security. Civil Defense, for instance, a key agency in this area, suffers from excessive centralization and a scarcity of resources. While natural hazards represent a far clearer and more present danger to the Dominican Republic than foreign aggression, the budget for Civil Defense is tiny in relation to the budget of the Dominican armed forces, a point emphasized to us by the current Director of Civil Defense. The overwhelming majority of that budget, moreover, is devoted to salaries, with very little left over for vehicles, equipment, and supplies. After the last hurricane, Civil Defense lacked the money to purchase baby food rations needed for thousands of infants in shelters and had to seek the assistance of foreign embassies and private-sector donors. The scant resources that Civil Defense has are concentrated in Santo Domingo, which makes it difficult to respond quickly to emergencies in remote areas of the country. The agency recently has begun a process of decentralization through the establishment of regional offices, but these, too, are outposts without resources.

The fierce competition for resources and the existence of myriad urgent problems in a developing country such as the Dominican Republic are no doubt the main reasons for the relative neglect in the area of disaster preparedness. The scarcity of resources is especially acute in the wake of the economic crisis the Dominican Republic has experienced in 2003. There are other factors weighing against a focus on disaster preparedness, however, including alternative government priorities, and bureaucratic inefficiencies and attitudes. As noted, military defense receives a much higher priority in terms of funds than civil defense, despite the absence of a military threat. Decentralization may require some initial investments but is not necessarily more costly in the long run; however, it runs against the grain of the Dominican tradition of bureaucratic centralization. Observers also noted repeatedly that there tends to be a short planning horizon in the Dominican Republic, a mindset reinforced by almost constant electioneering (every two years there are elections either for an entirely new legislature or for president) and wholesale replacement of state personnel whenever a new government assumes power.

Hurricanes

As evidenced by the casualties and property loss caused by Hurricane Georges in 1998, cyclones can and do inflict devastating damage on the Dominican Republic. Indeed, hurricanes are the most frequent type of natural hazards affecting the country. In a fierce 2004 hurricane season in the Western hemisphere, the DR was hit by two hurricanes (Ivan and Jeanne) in a single month.

Given its geographic location, Hispaniola has been hit by hurricanes throughout its history. However, there are fluctuations and cycles in hurricane activity. Some meteorological experts believe that the observed increase in recent decades in hurricane frequency and severity in the North Atlantic may be related to climate change and that, as water temperatures and sea levels slowly rise, these events are likely to become more common in their occurrence and stronger in their impact (GFDL 2004).

The recurring reality of hurricanes and the prospect of stronger and more powerful storms in the immediate future mean that the country and its people are more at risk than ever. There are now far more people living in especially vulnerable coastal areas, especially Santo Domingo, than in past decades. Tourist resorts have proliferated in the eastern part of the country, with new construction continuing apace. Unlike other areas of the Dominican Republic, this area stands in the direct path of storms, unprotected by the mountain ranges that partially shield the Cibao and other regions. A substantial percentage of the population in the major urban areas lives in rudimentary dwellings that afford little protection from storms and/or in hazardous areas such as the banks of rivers.

The densely populated capital, moreover, lacks a proper evacuation plan. The members of the civil agencies responsible for developing these plans often have conflicting interests and political agendas with the result that politics often gets in the way of developing comprehensive disaster response plans. One example is that some of the city's many one-way streets may change direction suddenly and without consultation with the other areas of the city directly affected by these abrupt changes (C. Herridge, interview).

The problem of evacuation is aggravated by the fact that the capital has few means of access and egress. If Santo Domingo were to suffer major infrastructure damage as a result of a disaster, it is possible that the city's lone floating bridge would be the only evacuation route remaining for most people. In a city with a population of more than two million, it would not be possible to effect a timely evacuation, and the result might be panic, chaos, and further needless loss of life. An event of this magnitude, causing major death and destruction to the Dominican Republic's most densely populated area and its political, economic, and cultural capital would pose a major threat to the country's economic and human security. In the event—not unlikely given Dominican political culture and recent experience—that the population were to perceive that the government had contributed to the toll of the disaster through negligence or malfeasance, there would likely be serious political consequences as well.

In addition to the problems existing in the capital itself, the major port at Haina near the capital is an area of special concern. There are large and unsecured facilities at Haina for the making and storage of various fuels and chemicals, which would likely incur serious damage in the event of a major hurricane. With families already squatting at or nearby these facilities, the everyday risks they face from leakages, fires, and air pollution would be multiplied in the event of a major storm.

Hurricanes place not only the population at risk, especially along the coast but also in low-lying interior areas, but also inflict significant economic damage. Hurricanes usually produce major agricultural losses; the most recent hurricane ruined a substantial portion of the plantain crop.

Hurricanes also affect the tourist industry. While there is tourist activity in many parts of the Dominican Republic, the main tourist destinations are in the coastal areas, particularly in the far east of the country in the Punta Cana/Bávaro corridor. Of the 2,937,056 non-resident arrivals in the Dominican Republic in 2003, the port of entry for a full 47 percent of travelers was Punta Cana—more than twice that of Santo Domingo (DR1 Travel News 2004). Currently boasting over 22,000 hotel rooms, the Punta Cana/Bávaro corridor is projected to have up to 75,000 rooms within a 10- to 20-year period (K. Robinson, interview). By clustering so much of the country's tourism infrastructure along a roughly 40-mile stretch of coast, the country is concentrating one if its primary revenue-generating sectors in an area highly vulnerable to damage caused by hurricane activity. There are also significant risks to the tourist population and the growing work force that has located in the area to serve the tourist trade.

Hurricane Jeanne cut off the land route to tourist zones in the east. Photo taken by Ing. Héctor O´Reilly, President of SODOSISMICA.

This increased concentration of tourism infrastructure on the east coast is happening despite mounting historical data reinforcing the notion that storm events in the Dominican Republic are becoming increasingly common and severe. Whereas there was only one hurricane category 3 or higher in the country from 1900 to 1950, there were five such storms from 1950 to 2000—the largest being Hurricane David in 1979, a category 5 storm (NOAA 2005).

If this apparent trend continues, the country's economically vital tourism sector will become increasingly vulnerable over time, particularly as little is done by the government to enforce codes and regulations that could minimize hurricane damage. Despite the knowledge that hurricanes can pose a dire threat to the economy, Dominican officials are hesitant to force the largely non-Dominican hoteliers to spend the money on properly safeguarding their facilities for

fear of making the costs of operating in the country higher than those in the growing number of alternative destinations in a fiercely competitive global tourism market.

A similar "avoidance" syndrome exists in relation to hurricane response. Certain types of disaster assistance from the United States and other parties are contingent upon the declaration of a state of emergency. However, as we learned from several informants, after Hurricane Jeanne in September 2004, the Dominican government was reluctant to declare a state of emergency out of concern for the negative repercussions it might have on perceptions of the DR as a safe and attractive tourist destination. However, this reluctance has significant costs in terms of relief and recovery efforts.

Floods

Floods represent another recurrent threat to life and property in the Dominican Republic. The human and material damage inflicted by floods has increased because of deforestation and increased settlements in areas prone to flooding, including dried-out riverbeds.

The latter was the case during the most recent flooding disaster in May 2004, when western parts of the country bordering on Haiti saw several days of heavy rains, particularly the town of Jimaní. The Dominican government estimated that the floods killed more than 400 Dominicans, displaced 1,600 families, damaged or destroyed 3,000 houses, and affected more than 15,000 people throughout the country (USAID 2004b). The death toll on the Haitian side of the border, where deforestation is much more severe, was several times higher. However, some Dominican observers believe official statistics understate the seriousness of the damage and think that the numbers are likely to have been much higher than officially disclosed on the Dominican side as well (C. Herridge, interview). In general, the Dominican government is known for understating the extent of damage caused by floods and other natural hazard events (C. Herridge, interview). Actual losses are sometimes understated for political and economic reasons to create the perception that the government is better prepared and tourism less at risk than is actually the case. Greater transparency, however, would tend to assist in prevention and mitigation efforts.

If hurricane and tropical storm activity increases as predicted, flood events are likely to become more common and severe as well. Floods are a less dramatic threat than hurricanes, but can often cause considerable damage. They are also more frequent, as they can occur in tandem with hurricanes or as a result of heavy rainfall not associated with a cyclone. Particularly in isolated areas of the country, they can cause serious destruction, as the Jimaní floods in May 2004 illustrated. These areas often lack response capacity, such as evacuation plans and first aid kits, which could save many lives. Many of the rural communities in high-risk areas are very isolated and lack paved roads and other physical infrastructure that could be used in response to flood situations. A lack of passable roads, for example, can prevent food and first aid supplies from being delivered to needy communities and can hinder efforts to evacuate populations at risk. Bridges built too low or too hastily in certain areas can be washed out during major flooding, as were some that we encountered in the countryside during the course of this study. Losing such critical infrastructure leaves many communities effectively isolated. This is aggravated by the fact that most responders are located in the capital several hours away from vulnerable areas along the border and on the northern, eastern, and southwestern coasts.

Furthermore, the people in these areas are generally poorly informed of the threats they face from rainstorms and river swellings, which often catch them unprepared. Communications are poor. Many of the people living in rural areas live off the land and build their homes and engage in farming in valleys or on slopes highly vulnerable to being washed away by flash floods. For

people living from agriculture in these areas, flood events can seriously jeopardize not only their livelihoods, but also their very existence.

Earthquakes

The third and perhaps least obvious natural hazard threatening the Dominican Republic is that of earthquakes. Although minor temblors are common in the Dominican Republic, major earthquakes are rare and unpredictable events. In light of the urgent problems of poverty in the country, aggravated by the recent economic crisis, earthquakes do not loom large in the popular consciousness or in the priority of governments.

However, the country's proximity to major fault lines and the history of large quakes means the nation faces a significant threat from seismic activity. Urbanization, population growth, and the construction boom that the country has been experiencing for most of the last thirty years—without the benefit of an appropriate building code—increases the probability that a major quake affecting large urban areas could cause more deaths and damage to the economy and infrastructure than the worst hurricane.

While coastal Santo Domingo faces greater peril from hurricanes than inland Santiago, the country's second largest city faces a more severe risk from seismic activity. Rapidly growing Santiago lies a few kilometers from one of the region's major fault lines. Seismologists estimate that this fault generates an earthquake exceeding 8.0 on the Richter scale roughly once in every 100 years (C. Herridge, interview). Some seismologists warn that the next major event is due at any time. The country as a whole has seen more than half a dozen large earthquakes in the last 100 years, including a 1946 quake measuring 8.1 on the Richter scale that killed over 100 people (USGS 2005). This same earthquake in the Hispaniola Trench also caused a large tsunami, which killed an estimated 1,700 people in Haiti and the Dominican Republic (AP Wire 2005). Given that tsunamis result from the kind of seismic activity that is frequent in the Caribbean, the U.S. Geological Survey considers the area "a very dangerous place for tsunamis" (AP Wire 2005).

Although the whole island of Hispaniola is at risk for major earthquakes, Santiago is particularly at risk because it is the most populous area adjacent to the fault line on the Dominican side of the island. Like Santo Domingo, Santiago lacks a proper evacuation plan and could be a scene of chaos in the event of a major earthquake. The city, which has been growing in population and spreading outwardly at a rapid rate, also has little physical infrastructure built to withstand a large seismic event, with a full one third of its physical infrastructure likely to be severely damaged during a major earthquake (C. Herridge, interview).

Since so little government-owned infrastructure is properly insured, the state would take a devastating financial hit if a major quake hit Santiago. Furthermore, the soil around Santiago is sandy. Sandy soils have been associated with major damage in other regions with a similar geology, such as Japan, where buildings have been known to literally sink into the ground during large earthquakes. Given these conditions and the general lack of a proper response capacity, a large earthquake in the Dominican Republic affecting a major urban center would likely cause large-scale damage and major loss of life.

The Way Ahead

In order to prepare for and mitigate the negative impacts of natural hazards, the Dominican Republic needs to adjust its priorities in terms of resources and focus. Policies must correspond to the potentially grave consequences of natural disasters. The creation of the National Emergency Commission (CNE) was a significant step forward. But the lack of financial commitment, excessive centralization, and a short time horizon are obstacles still to be overcome

in order to minimize the toll that inevitable natural disasters will wreak on the people and the nation. In addition, steps that could be taken in the area of disaster preparedness and mitigation include more rigorous building codes and better enforcement, selective retrofitting of key structures, providing vulnerable communities with first aid kits and radios to monitor the progress of potentially threatening storms, adopting insurance schemes for publicly held infrastructure to minimize the economic damage of natural events, and improving storm and seismic monitoring.

Land Use Planning and Management

The Dominican Republic's past institutional weaknesses and governance failures have resulted in the absence of effective land use plans at the national, regional or local levels. The lack of zoning and regulation of land use has led to a pattern of irrational land use. The problem has become more acute with the rampant urbanization and population growth witnessed in the last 30 years, the burgeoning slash and burn tourism sector, and the expansion of environmentally destructive agricultural practices, which are producing dramatic changes in land use in the Dominican Republic.

The combined impact of these rapid changes in the land, absent zoning standards and land use planning, is degrading the country's natural resource base and, unless addressed, could threaten the future security and stability of the country. Although in recent years land use studies have been carried out for several urban areas and a national land use law has been under discussion in Congress, nothing has been implemented and no land use study has been conducted for Santo Domingo, the nation's capital and major urban concentration. While there clearly has been some recent progress toward land use planning and management, this process has been running far behind the curve of development and degradation of the environment.

Institutional Weakness and Irrational Land Use Management

Rational and sustainable land use is critical to the country's capacity to feed its population, provide water, develop the tourism industry, and diminish vulnerability to natural hazards. In the Dominican Republic, as in most developing countries, "heavy population pressure and the related increased competition from different types of land users have emphasized the need for more effective land-use planning and management" (FAO 1996).

Admittedly, Dominican policymakers face the daunting challenge of responding to the often-clashing demands for rapid economic development, employment generation, and sound management of natural resources and the environment. At present, there are no effective standards pertaining to land development and zoning. Various government ministries set policies for their sector with no overarching comprehensive land use planning and management plan designed to enable the country to manage its land resources in a sustainable fashion according to accepted norms that are "based on knowledge of these resources, the demands of the use to which the resources are put, and the interactions between land and land use" (FAO 1996). Until these are established, uncontrolled growth of urban areas, the mismanagement of agricultural land, and the unsustainable use of natural resources will continue unabated.

Land Use and Natural Hazards

As a country frequently hit by hurricanes, floods, and seismic movements, the Dominican Republic has a vital need for adequate disaster preparedness, including land use management practices that reduce the risks of natural hazards. The Dominican Republic is described by UNEP as "highly vulnerable" to hurricanes, earthquakes and floods (UNEP 2002). The country is ranked second in the Caribbean on the World Institute for Disaster Risk Management's Natural Hazard Vulnerability Indicator (Dannenmann 2004).

The country's poor land use patterns aggravate the impact of recurrent natural hazard events, leading to unnecessary loss of life and property and the destruction of natural resources. In 2004, the May floods resulted in more than 400 deaths on the Dominican side (USAID 2004a); Hurricane Jeanne caused 11 deaths in September (Ford 2004) and $322 million in damages (Travel News Wire 2004). There is little doubt that much of this loss of life and property was preventable. According to the Director of the National Institute of Hydraulic Resources at the time of the May 2004 floods, Silvio Carrasco, the destruction in Jimaní arose in large part as a result of locating a settlement on a dry riverbed. Carrasco further noted that the riverbanks and surrounding areas have been significantly deforested, serving to exacerbate the devastation (DR1 2004). Relocation would seem the evident short-term solution. But Jaime Lockward of SEMARN's Environmental Protection unit and others interviewed pointed out that residents often resist efforts to relocate them or bar them from erecting homes in hazardous areas (FESS Roundtable Discussion). These protests sometimes turn violent.

After Hurricane Jeanne struck, the lack of sound land management planning for the building of hotels and the proper enforcement of waste management practices meant that raw sewage and trash infiltrated water supplies and surrounding beach areas. As a result, there were disease outbreaks, including an increase in the incidence of malaria. The situation could have been worse. Haiti once again is an example of what could happen in the Dominican Republic if deforestation were to resume and improper land use continue. In Haiti, Hurricane Jeanne killed more than 2,400 people: As Peter Ford of the *Christian Science Monitor* reported, "because nobody planned the way land is used, people [in Haiti] were living in areas vulnerable to flooding. They were made even more vulnerable by the way people have cut down most of the forest in Haiti for fuel, which left the hills unprotected against mudslides" (Ford 2004). Without tree roots to bind soil together, it is simply washed away by heavy rain. After the flood, there is even less land to farm (Black 2004). While the Dominican Republic is better prepared to deal with natural disasters than Haiti, lack of land use planning and rapid coastal development in the DR are increasing the country's vulnerability to the major loss of life and property as a result of recurring natural events.

Land Use Management and Agriculture

The Dominican Republic relies on its forests for most of its water supply. Water not absorbed by vegetation runs off and is lost for domestic, agricultural, or industrial use. However, ranchers and farmers have taken over many forest areas to raise cattle or grow crops such as beans that have a negative environmental impact when grown on hillsides. For example, the forests in the mountainous areas of San Juan de la Maguana have been subjected to extensive burning in order to grow beans. The Ministry of Agriculture has promoted such practices by providing free seeds to hillside farmers (Moya Pons 2004).

The prevention of such slash and burn practices is the responsibility of the ministry of the environment and the environmental police. But that task is made more difficult—and the Dominican state is working at cross-purposes—when agricultural policy promotes hillside farming. The cultivation of beans in the highest and most forested areas has increased the production of beans, but it comes at a high cost in the form of decreased water availability for more productive farmland in the valley and decreased generating capacity for dams as a result of decreased flow and increased silting (Moya Pons 2004).

The push to grow food crops in unsuitable lands, justified by the need to generate employment and income for rural workers and food security for the nation, is irrational insofar as it has devastating effects on the national interest in soil conservation, the efficient use of land, and the

maximization of electricity generation through hydraulic power, a domestic, renewable, non-fossil fuel source.

The cutting of trees for agricultural land is not only contributing to the loss of millions of tons of soil carried away by rivers but is creating other serious problems as well. Runoff is contributing to the sedimentation of ocean bays and damaging harbors. The soil carried by the Rio Isabella and Ozama River is creating a deep marine basin in front of Santo Domingo. The Bays of Samaná, and Neiba, and the coastal waters of Monte Cristi, all contain evidence of significant alluvial underwater deposits.

The depletion of water for human consumption poses an even more serious consequence of inappropriate land use and slash-and-burn agriculture. Deforestation of Los Haitises is impacting the water supply for the areas between Hato Mayor and Santo Domingo. Dominican officials are aware of the environmental and security implications. As former Minister of the Environment, Frank Moya Pons, has stated, "Water security is our responsibility, not simply for ecology, but for national security." The logic of Moya Pons's argument is clear. The destruction of Dominican forests for agricultural use has an adverse effect on food production by reducing the water supply to the most productive lands (Moya Pons 2004). Dwindling access to water would decrease human security and the nation's food security, increase the probability of conflict over alternative uses of land and water, and potentially erode political stability

Land Use Management and Urban Development

In urban and semi-urban areas, unplanned breakneck growth is straining water supplies, paving over some of the richest agricultural land in the world, promoting construction in hazardous or environmentally sensitive zones, and multiplying urban environmental problems.

Precarious hillside construction in Santo Domingo.

The loss of extremely fertile agricultural land is one of the tragedies of the absence of land use planning and regulation. The Cibao valley, the country's breadbasket, is rapidly losing its role as the country's prime agricultural zone. Known for fertility rivaling the Mississippi basin, a major part of the valley is becoming a vast suburb for Santiago and Moca. The country's best rice land is being sold for housing developments. And the road between Santo Domingo and Santiago, once known as the "agricultural zone par excellence," is turning into the "urban zone par excellence" (Moya Pons 2004).

Another incident of misguided land use policy coupled with enforcement gaps is in Juma and Bonao, where the Dominican government has invested significant resources to produce new rice varietals to feed the growing population. According to Moya Pons, government functionaries from the previous Fernández and former Mejía administrations have allegedly taken the land along the highway illegally to convert it to housing developments. Such collusion between moneyed interests and government officials is harming the country's long-term food security.

In the past, according to geographer Rafael Emilio Yunén, Director General of the Centro Leon Cultural Center, environmental issues were viewed from the perspective of the countryside (Interview with Rafael Emilio Yunén. September 28, 2004). Now, the country must look through an urban lens because an increasing majority of the population is urban, while only 30 years ago it was less than 40 percent urban.

But adequate planning, zoning, and enforcement mechanisms for urban development are not in place. As Dan O'Neil, the Director of the Santo Domingo office of the Pan American Development Foundation stated, enforcement is politically difficult. For example, in some areas

people are building over drainage canals, clogging them. But in at least one area the people told the mayor that if the local government tears down the houses, the people would tear down the government (O'Neil. FESS Roundtable Discussion, November 9, 2004).
Annette Tejada, Director at the Center for Urban and Regional Studies at Pontificia Universidad Católica Madre y Maestre (PUCMM), noted that planning for sustainable urban growth is in flux in the Dominican Republic (Interview with Annette Tejada, October 1, 2005). The result is a crisis in urban services such as sanitation and garbage pick-up and disposal.

Conclusion
The absence of land use planning and policies is the legacy of limited institutional capacity, insufficient political priority and will, and scarce human and financial resources. The Dominican state has been moving toward instituting land use planning for several years through such steps as the creation of the Council for Urban Affairs or CONAU, collaboration with the Center for Urban and Regional Studies at Pontificia Universidad Católica Madre y Maestre (PUCMM) in the production of land use studies for several cities, and the drafting a national land use law. However, there is a long way to go before comprehensive and effective land use planning is implemented in the Dominican Republic. Yet, land use planning and management is critical to the country's environmental agenda, its long-term development prospects, and its national interests and security.

The Dominican Economy: From Slash and Burn Agriculture to Slash and Burn Tourism?
For centuries, agriculture and livestock were the economic mainstays of the Dominican Republic. As late as 1985, 55 percent of the country's land area was comprised of farms (de Ceara 1986). This traditional economy was based on unsustainable practices -- including slash and burn agriculture, hillside farming, and overgrazing -- but until well into the twentieth century this fact was masked by an abundance of land relative to population. As a result of several factors, including soil erosion and other forms of environmental degradation, the predominance of agriculture ended in a single generation and was replaced by an economy centered on manufacturing for export in free trade zones, the export of labor (which brings the country hundreds of millions of dollars annually in remittances), and services, especially tourism.

The fact that the declining but still important agricultural sector continues to employ unsustainable methods is perhaps less troubling than the realization that the rising tourism industry appears to be headed in the same direction—only at a faster rate. These two critical components of the DR's economy and security—agriculture and tourism—heavily depend on a healthy environment for long-term sustainability, but neither sector currently is being managed in a sustainable fashion. The long-term rationality of such management often clashes with short-term needs for job generation, income growth, government revenues, debt reduction, political patronage, and profits. Yet the long-term viability of agriculture and tourism, two sectors that are highly vulnerable to endogenous and exogenous shocks such as natural hazards, is critical to the stability and security of the Dominican Republic.

Agriculture
The role of agriculture in the Dominican economy has been in a steady decline for decades. This decline almost certainly will continue—albeit probably at a slower rate—in spite of efforts to promote non-traditional exports (NTEs) such as organic coffee and bananas, which even in a best-case scenario are projected to represent a minor proportion of Dominican exports.

Every measure—employment, GDP, exports—points to the fact that agriculture in the Dominican Republic has declined dramatically during the latter half of the twentieth century. Agriculture went from employing 6 out of 10 Dominicans in the 1960s (Pomeroy n.d.), to less than 2 in 10 by

the turn of the century (FAO 2004). In the two decades between 1980 and 2000 alone, the percentage of the labor force in agriculture fell by half (FAO 2004). By 2002, agriculture only comprised 11.5 percent of GDP and had been reduced in status to being the fourth largest sector (Economic Intelligent Unit 2003). The sharpest decline has been in sugar; the share of sugar in agricultural exports fell from 52.2 percent to 13.3 percent over the last two decades of the twentieth century (FAO 2004).

One of the factors driving the Dominican labor force away from the countryside and into the cities is the grossly uneven distribution of land and the nature of land tenure. Microfundia and latifundia coexist in the Dominican Republic. A 1985 study found that among the 385,000 properties in the country, 85 percent had less than 5 hectares, and cumulatively these tiny holdings comprised only 12 percent of the agricultural land. In contrast, 18 percent of producers owned 88 percent of the land. Moreover, a significant proportion of producers are sharecroppers or squatters on government land (de Ceara 1986). While the number of producers has declined during the last 20 years, the highly unequal structure of landholding has not.

The shift away from sugar production has been accompanied by an intensification of production of staples for the growing Dominican urban population and of specialty crops for tourist consumption. Dominican observers who stress the enduring importance of agriculture point to its role in ensuring food security and political stability and in supporting a model of mass tourism based on cheap rates. “We had shortages of gasoline for a few weeks when Chávez and Hipólito were fighting, and nothing happened,” a Dominican agricultural expert told us. “If we had a shortage of rice and beans even for a few days the street would have exploded,” he added.

In light of these concerns, the DR has focused on increasing the domestic production of cheap foods such as plantains, rice, and beans. Indeed, in his most recent speech, President Fernández announced the continuing promotion of the Program for the Recovery of the Production of Basic Foods (Fernández 2005). Unfortunately, increased production of food crops has been accomplished by expanding the agricultural frontier into marginal areas and utilizing inefficient irrigation systems. The result is extensive land and aquifer damage.

A driving force behind the irrational use of water is the desire by political leaders to achieve food security through making the food supply as cheap and reliable as possible. Although in some cases importing food may be more economical, domestic production ensures national control of a resource that has major political implications, including not only food supply, but also employment and profits for large producers.

Agriculture under irrigation uses 85 percent of the country’s water, but the hydrology of the country does not easily accommodate the production of water-intensive crops like rice and beans. Despite natural constraints, political support since the 1980s has encouraged the expansion of irrigation-based agriculture throughout the country for crops deemed important to internal consumption. Further, government-subsidized water virtually destroyed any incentive to use the resource efficiently and fostered even more reliance on irrigated crops. Rice cultivation, in particular, is one of the most widely cited examples of excessive water use harming the environment, with implications for future stability and sustainability. The impacts include an increasing level of salinization of soils and aquifers, and the deterioration of major watersheds, such as the Yaque del Norte and Yuna (IRG 2001).

Although the Dominican government has begun charging producers for irrigation water, it is not clear how consistent the practice is or how reflective the price is of the real cost. What is certain

is that there is still much wasteful and irrational use of water. This is a serious problem in light of what many predict will be a major water crisis in coming decades.

Along with wasteful and damaging irrigation practices, deforestation and hillside farming are major components of an unsustainable agricultural production system. Past governments have encouraged the growing of beans on land that would be better suited to forestry or other agricultural activities, thus damaging the soil and watersheds. Not only do these practices promote soil erosion, they aggravate the water supply problem. The river Nigua, once a major stream, now is a mere trickle of water. That is the situation of most rivers in the Dominican Republic today.

Past government policies in the Dominican Republic in the areas of agriculture and irrigation have promoted unsustainable practices. In some cases, these practices have been stopped, but there is also evidence that some unsustainable agricultural practices continue and, in some instances, have intensified even as the agricultural sector declines.

Tourism

The growth of tourism stands in counterpoint to the decline of agriculture in the Dominican Republic over the last three decades. The industry has become a key generator of employment and income for the nation. The Dominican Republic now has over 772,000 jobs in the tourism industry, more than any other country in the Caribbean, including Cuba (505,900) and Jamaica (387,400) (World Travel & Tourism Council 2004). In 2004, the estimated economic activity generated by tourism for the Dominican Republic is expected to exceed US$5.2 billion, while Cuba, the Bahamas and Jamaica are expected to produced US$4.8 billion, US$3.6 billion, and US$3.3 billion, respectively (World Travel & Tourism Council 2004).[5]

Although tourism is touted as the industry of the future, the irony is that at present it suffers from the same problem as agriculture, namely unsustainable practices. The new engine of growth is built on a fragile political, social, legal, and natural resource foundation that does not ensure its long-term viability. Already, the Dominican Republic has had the experience of the costs of unsustainable tourism practices. The hotels and resorts on the north coast in the Puerto Plata area, popular in the 1970s and 1980s, declined drastically thereafter as a direct result of environmental degradation.

The current optimism regarding the dynamic tourism sector is tempered by knowledge of the scope of the problems and the scant current capacity to solve them. While some look to the tourism sector as the panacea for a country in crisis, the challenges faced in that sector are immense: a lack of basic services such as solid waste disposal; inadequate infrastructure, including water and sewer systems; coral reefs under “high” or “very high” risk levels (Burke and Maidens 2004); shrinking underground aquifers threatened by salinization; and very limited enforcement of environmental laws.

Focused on mass tourism with no clear strategy to achieve a higher-valued added and more environmentally and economically sound model for the long run, the Dominican Republic may temporarily benefit economically from an increasing volume of tourism. But, the emphasis on the number of visitors implies significant adverse environmental consequences, and environmental degradation over time may well destroy the attractiveness and economic viability of tourism.

There are at least four broad challenges facing the Dominican tourism industry. The first is that the fast-paced growth of the tourism industry, a boon for economic growth, has outpaced the

development of the necessary infrastructure, policies, and services for the sector's medium- to long-term sustainability.

Nowhere is the gap between the growth of tourism and the development of infrastructure more evident than in the Punta Cana/Bávaro corridor, the country's leading tourist destination. There is no master plan for development of the area, and the state does not provide basic services, which leads to ad hoc solutions by individual hotel operators (Robinson, interview). Typically, the hotel operators build and maintain the roads to and from their resort, contract for garbage collection, dispose of sewage, provide potable water, hire their own security, and provide their own electricity generation.

Hotel operators complain that tourism is the country's economic engine, but they receive no services despite paying taxes. The government counters that tourism is hugely profitable, with hotel owners recovering their capital investment in as little as five years net of infrastructure costs. The state must use its limited resources to respond to such basic needs as nutrition for the poor, public education, and health care, rather than subsidize a highly profitable industry.

The system of private provision of basic services in Punta Cana/Bávaro has many problems, however. For instance, while hotel operators strive to provide guests with pure drinking water and aesthetically pleasing surroundings, sewage and solid waste disposal is often erratic or absent.

This piecemeal provision of public goods paid for by the private hotel companies also excludes the majority of workers who service the industry and the communities that spring up on the periphery of the hotel complexes in response to the demand for labor and services. Ten years ago, the town of Verón, the closest settlement to the resorts of Punta Cana, consisted of just five houses. Now there are 5,000 people. The government has provided this new town very little in the way of the necessary infrastructure, educational facilities, and health services.

Chronology partly explains the current gulf between tourist development and the corresponding infrastructure and institutional arrangements necessary to make the industry viable over the longer term. Tourism has been growing briskly for over two decades, while environmental protection is new in the Dominican Republic. The fundamental environmental law is less than five years old. The laws regulating specific sectors have been working their way through the Congress over the last four years; the process is far from complete. This means that the basic legal and policy framework for environmental regulation remains embryonic and weak.

The Ministry of Environment and Natural Resources itself was established and set up from scratch during the last presidential term (2000-2004). This required identifying and integrating functions previously scattered among many ministries as well as settling various turf battles. As a new ministry, which in the short-term at least represents a cost center, the environmental ministry is in a weak position in debates with other ministries such as tourism and agriculture, which generate revenue and employment. Further, the minister, in the words of one of our interviewees, "was hampered because he had to build an institution in an anti-institutional government." On top of the challenges posed by the ad hoc and highly politicized culture of the Mejía administration, the economic and fiscal crisis after April 2003 meant more limited resources for the environmental portfolio.

Land use management and planning has numerous implications for the tourism industry. According to representatives of the most prominent tourism associations, the government has limited effective control of its territory, including the tourist areas. This means, for instance, that a huge investment in a tourist complex can be ruined if a polluting power-generating plant is built

in its vicinity. This actually happened in the Puerto Plata area; indeed, such problems were at the root of the downfall of the tourism business in Puerto Plata.

Although observers are unanimous that, despite the remaining gaps, much progress has been made in laying out the institutional and legal framework for environmental regulation, enforcement is repeatedly identified as an area of weakness. In most of the tourist areas, the environmental law is often violated or ignored. Most of the hotels operate illegally in numerous ways, from initial construction to daily operations. Only a few hotels are known to apply environmental regulations strictly, notably the Punta Cana Resort, Natura Park, and the Bayahibe resorts. According to one government official, the environmental impact assessments for most new tourism projects were done poorly. The new Cap Cana project, an estimated $3 billion, 18,000-room, 30,000-square-acre resort being built in an area prone to flooding, is a project some informants cited as a perfect example of unregulated growth. According to one informant, the resort has not complied with 20 percent of the environmental regulations required in construction, and many argue there is not enough water available for so many additional rooms. Another example of enforcement problems in construction took place in Samaná, where a European project began construction without proper licenses. A Dominican consultant had advised developers it was a better strategy to seek approval after the fact. Other tourist developments were constructed in remote areas, and the environmental ministry only became aware of them after significant damage had occurred.

Violations are also common among existing hotels. Hotel operators sometimes outsource violations of environmental laws. In Punta Cana, for example, there are 13 reported clandestine dumps where contractors dispose of garbage for hoteliers who pay them to haul it away in order to save money.

The Environmental Police, composed of members of the armed forces attached to the environmental ministry, are charged with enforcing environmental laws. While a dedicated army colonel leads the force as of early 2005, the Environmental Police have very limited resources to deal with vast responsibilities. For example, the Environmental Police have virtually no presence in the main tourist areas of the east. “Environmental police? I know they exist but I have never seen them” is a typical response.

The ministry of the environment under the current government has evidenced increased initiative and more rigorous enforcement, including in relation to tourism.[6] The minister has signaled that he will support the director of the environmental police in situations in which there may be a conflict with higher-ranking members of the armed forces who are violating environmental laws. His strategy, centering on the concept of *transversalidad* (cross-cutting policymaking or “mainstreaming”), appears to be based on attempting to evoke President Fernández’s authority and interest in international recognition to advance the position that environmental principles need to be infused throughout the government and the society.

A second major challenge in relation to the tourist industry is that the current business model of tourism employed in the DR is not sustainable in the long term. By analogy with agriculture, some observers describe the Dominican tourist industry as “slash and burn” tourism, insofar as it is destroying the aesthetic, environmental, and natural resource base upon which it depends. While the biodiversity and natural attractions of the Dominican Republic would allow the country to promote ecotourism and adventure tourism successfully, there are serious structural impediments to ensuring that tourist development is environmentally sustainable.

Although some of the more recent tourist complexes have introduced better environmental practices, it is still the case that as tourism grows so does environmental stress. Among the major challenges are excessive consumption of water in coastal regions that have little underground water and the generation of solid waste in areas with high concentrations of people. The overuse of water is a critical concern as it results in aquifer salinization, which in turn may greatly increase the cost of water and undercut the economic viability of tourism. The lack of an overall strategic or land use plan for tourism development means that hotels are built on any piece of available land whether or not the water, sewage, and other basic services are in place. The strategy is clearly short-sighted—tourists who brush their teeth with salty water will not return, and hotels operating for quick and easy gains will find it difficult to turn a sustainable profit if they have to pay for desalinization. However, while this is a major concern for the country, it does not appear to be compelling for hotel owners who can recover their investment in a short time or for managers of chain hotels who may be assigned for a limited time to any specific location within a global network.

Changing the tourism model is difficult because the industry is dominated by vertically integrated foreign hotel operators, primarily Spanish, but also German and North American, whose profits depend on a high volume of relatively inexpensive tourism for working and lower middle class Europeans who enjoy long vacations but have limited disposable income for tourism. The hotels are integrated with tour operators who essentially control the industry's success. They buy rooms in bulk, offering complete packages from airfare and food to entertainment. The tour operators can choose from a growing number of destinations in the Caribbean and other subtropical areas of the world. Thus, they control demand and thereby possess considerable bargaining power.

The Dominican government is caught in a delicate balancing act. The state has an interest in maximizing tourism revenue, but it also faces criticism from domestic constituencies and international actors when it is seen as colluding with the tourist sector in ignoring or circumventing environmental standards**.** Without a strong governmental role and considerable political will, the situation is not likely to improve. For many tourism operators, the environment is an externality that can be ignored and used until it is exhausted. According to this mindset, tourism development means building new rooms regardless of the long-range impact. Even those complexes that have adopted more enlightened policies through their own initiative, such as the Punta Cana Resort, have admitted shortcomings, while the norm for the rest of the tourism industry is significantly lower in relation to environmental practices.

The third challenge relates to the Dominican Republic's vulnerability to hurricanes and other natural disasters. Many tourist facilities are woefully unprepared for events that are entirely predictable given the country's geographical location. The September 2004 hurricane provides an instructive example of the country's inability to cope when disaster strikes. After Hurricane Jeanne hit, tourists stood in several inches of water and thousands had to be evacuated in army helicopters. The vast majority of the hotels had to be closed, and 18,000 of the east coast's 22,000 rooms went vacant for one month, while 10,000 went unoccupied for three months. It took several months for the country to fix the bridge that links tourists to 60 percent of the country's hotel rooms. There was a loss of electric power for weeks, significant infrastructure damage, an increase in some diseases such as dengue and malaria,[7] and wastewater treatment plants spilled human waste directly into the ocean for several days. While many countries would have closed the beaches under similar circumstance, the DR, fearing devastating damage to tourism and to the battered economy, chose not to do so or to declare an emergency.

The inevitable toll caused by natural hazards is aggravated by institutional weakness and sheer negligence. Poorly constructed bridges that are rarely maintained are likely to collapse even in a

moderate storm. During a visit to Punta Cana, natural hazards expert Christine Herridge reported finding a significant number of practices that would exacerbate the impacts of a disaster. Hotels had 250-pound fuel tanks on tin roofs and unsecured hotel equipment and appliances. At the airport, fuel tanks were located near landing strips with no fences or perimeter borders. The only fire trucks remained at the airport, while the Punta Cana Resort owns the only satellite phones in the entire area.

Finally, the development of tourism is making the country more vulnerable to social conflicts as a result of exploitation and ethnic tensions. Tourism has become the new employer for many Haitians, who are used as construction and maintenance labor. Haitians are hired through contractors to avoid paying benefits, thus saving 40 percent compared with what Dominican workers receive. Many of these poorly paid Haitians live on the construction site itself, but others live outside the work sites in the Punta Cana/Bávaro area, where a "little Haiti" now exists. In the Haitian area, poverty is profound, and the CDC recently found malaria—an obvious threat to tourism.
While hotels welcome workers, they prefer they come alone. However, many of their families eventually come to join them. Local business associations have discussed the possibility of registering Haitian workers in an attempt to exclude family members and "undesirable elements."

During the September hurricane, many of the hotel employees stayed in the facility because most live far away and the roads were impassable. However, the hotels did not feel any responsibility for Haitian workers whom they employ indirectly through contractors. Consequently, the Haitians had no refuge or supplies (the stores had been closed), and they were forced to live on coconuts and oranges for several days. Finally, Kelly Robinson of the Grupo Punta Cana persuaded a local *colmado* (grocery store) to open for fear of conflict between hungry, dehydrated, and desperate Haitians and the local Dominican population. "They all have machetes," is the powerful argument that was used to persuade people it was in their interest to help the Haitians.

Given the longstanding history of misperceptions, animosity, and conflict between Haitians and Dominicans, the increasing reliance on Haitian laborers in the tourism industry construction sector, combined with conditions of unequal economic treatment and social exclusion, make for a volatile mix, especially in the wake of a natural disaster. At the same time, as conditions in Haiti have deteriorated, the trend toward more permanent and less transitory migration has increased. While many observers believe the risk of outright conflict is low because of the enormous disparity of power, some preconditions for violence, including socioeconomic grievances, the illicit circulation of small arms, and a near absence of state response to basic needs, are present.

In addition to social problems experienced in the Haitian communities, the spread of tourism has meant dramatic changes for some Dominican communities that were in the path of development. The community of Juanillo, a fishing village located just south of Punta Cana/Bávaro, was relocated three kilometers inland. This meant not just a geographical change but more importantly also a drastic change in the mode of livelihood, with accompanying economic and social consequences.

However, along with the treatment of Haitians, this is just one instance of a broader segregationist syndrome readily observable in the current tourism development model in the east. Tourists are ferried in and out of large-scale resort enclaves, with minimal contact with local residents and the difficult living conditions present in the area. Plans are now moving forward on the construction of a 43 kilometer north-south "boulevard," that will separate local communities from tourist complexes along the entire breadth of the eastern tourist areas.[8] Although some tepid efforts are being made to incorporate local communities through cultural visits for tourists, the current

tourism model in Punta Cana/Bávaro may contribute to perceptions of a rich-poor divide that finds expression in the actual physical separation of communities.

Conclusion

As it enters the next phase of the transition from an economy mostly based on agriculture to one heavily reliant on tourism, the Dominican Republic faces the challenge of improving the sustainability of an old but still essential industry and an even stronger imperative to ensure the sustainability of the new engine of growth. Yet, current trends suggest that for a variety of reasons tourism is in great measure following the unsustainable pattern long-established in agriculture. Among the myriad problems that need attention are pollution, basic infrastructure, sanitation, water usage, coordination of public and private responsibilities, enforcement of environmental regulations, vulnerability to natural hazards, potential tensions with Haitian workers, social exclusion of local communities, and competition with Caribbean neighbors.

In principle, the Dominican Republic has significantly improved its institutional capacity to deal with many of these problems, especially since the enactment of the environmental law in 2000. But the government is playing catch-up, has other urgent problems to confront at the national level, and is often pitted against or in danger of being corrupted by powerful economic interests.

Given these contending forces, the participation of civil society and international actors could have a major impact. Although environmental consciousness is not yet a mass phenomenon in the Dominican Republic, the country has a significant number of NGOs who advocate for the environment through activism and the media. The country's tourism industry is affected by its image internationally, a fact that potentially gives Dominican advocates for sustainable development considerably more leverage than they might otherwise have. The task ahead, however, is daunting, and the window of opportunity for addressing many of these problems will not remain open indefinitely.

V. POVERTY AND ENVIRONMENTAL DEGRADATION

Despite almost continuous economic growth for 50 years and the boom of the 1990s, by every measure widespread poverty continues to plague the Dominican Republic. Persistent poverty has serious political and social consequences for the DR as well as major implications for the environment and, ultimately, for national security.

The percentage of the Dominican population living in poverty varies depending on the measurement method used by different sources. According to data for 2002 from the UN Economic Commission for Latin America and the Caribbean, 41 percent of Dominican households lived in poverty even before the recent economic crisis (ECLAC 2003). Almost half of these, or about one out of five Dominican households (19 percent), lived in extreme poverty (*indigencia*).

Using a broad measure of well-being, the Dominican Republic ranks 98 out of 177 countries in the UNDP's Human Development Index (HDI). Focusing more narrowly on living conditions, the DR ranks 26 out of 95 developing countries on the UNDP's Human Poverty Index (HPI), which combines three variables (a long and healthy life, access to education, and a decent standard of living).

Although in recent years the Dominican Republic has outpaced most of Latin America and the Caribbean in economic growth, it does not compare favorably in terms of poverty and standard of

living with most other countries in the hemisphere or other countries of the world at comparable levels of GDP per capita. The DR's rank on GDP per capita (71) is considerably higher than its HDI ranking (98), indicating a gap between average income and the living standards of the poorest sectors of the population. This gap is reflected in such social indicators as the infant mortality rate, which for 2000-2005 is estimated at 34.4 per 1,000 live births, down sharply from 62.5 in 1980-2005, but more than three times the rate for Costa Rica (10.5) and more than four time the rate for Cuba (7.3). Placed in the context of Western Hemisphere countries, the Dominican Republic ranks 17th out of 23 countries on the Human Poverty Index.

Table 7
Human Poverty Index Rankings
Western Hemisphere Developing Countries
Out of 95 Developing Countries in the World

COUNTRY	INDEX RANKINGS
Barbados	1
Uruguay	2
Chile	3
Costa Rica	4
Cuba	5
Trinidad & Tobago	8
Panama	9
Colombia	10
Venezuela	11
Mexico	12
Jamaica	13
Paraguay	15
Brazil	18
Ecuador	20
Guyana	21
Peru	23
Dominican Republic	**26**
Bolivia	27
Honduras	32
Belize	33
Nicaragua	37
Guatemala	44
Haiti	68

Source: UNDP, *Human Development Report 2004*, 149.

"There are two basic causes of environmental degradation in this country," a senior official in the current Dominican government told us, "poverty and greed." The role of poverty in environmental degradation in the Dominican Republic was a strong recurring theme in our interviews. Like this high-ranking government official, most respondents took pains to add the caveat that it would be wrong to conclude that the poor are primarily responsible for the country's environmental problems. Large economic interests are responsible for significant portions of the country's environmental damage.

The complex nexus between poverty and environmental degradation occurs at both the macro and micro levels. Whether one focuses on the nation-state, the firm, the household, or the individual,

scarce resources make more difficult and painful the tradeoffs between short-term economic gains and longer-term economic, environmental, and security concerns.

At the macro level, government resources are always very scarce in developing countries, all the more so in the Dominican Republic, which is highly indebted and struggling to emerge from an economic crisis. Funding for environmental management, enforcement of environmental laws, treatment of waste water, solid waste disposal, and mitigation of natural hazards must compete with such urgent needs as nutrition for the poorest sectors of the population, basic health care, access to water, and elementary education. While in rich countries the tradeoff may take the form of the choice between an additional one tenth of one percent of economic growth versus cleaner air, in a poor country it may come down to money for environmental protection versus funds to feed a significant portion of the population (and in so doing also avert political turmoil and/or violent conflict). At the level of private firms in the Dominican Republic, which are increasingly competing with other enterprises in more advanced countries with more efficient technology, more capital, and better access to markets, the tradeoff between environmental responsibility and profitability can be just as brutal.

At the level of individuals and households, in a rich country the tradeoff may be between purchasing a small, underpowered hybrid car versus an SUV. For rural Dominicans, the choice often has come down to practicing slash and burn agriculture or going hungry (or migrating to a big city or another country). For Haitians, the choice is to cut down trees in order to make charcoal for cooking or to starve. Having cut down almost all the trees on their own side of the island, some Haitians cross over to cut them in the Dominican Republic or to obtain employment, while others attempt to migrate to the United States or other countries. The same severe logic applies to marine resources. The mixture of a lack of knowledge and desperation drives fishermen—both Dominicans and Haitians who have migrated to coastal areas of the Dominican Republic—to use unsustainable fishing practices.

These practices may alleviate the immediate problem but the future consequences are very likely to be devastating not only in environmental terms, but also in terms of economic effects, political consequences, and the national interest.

Rural poverty not only promotes unsustainable cultivation practices, but it is also a cause of the aggravation of many urban environmental problems. These problems become unmanageable when massive rural-to-urban migration overwhelms the capacity of urban areas to develop adequate infrastructure, such as sewage systems and sanitation services, including pick-up and disposal of solid wastes. Differential rates of poverty (46 percent versus 39) and extreme poverty (23 percent versus 16 percent) in rural versus urban areas (according to ECLAC data and much higher according to other sources) only begin to capture the differences in living standards and opportunities that motivate internal migration in the Dominican Republic.

The problem of solid waste.

The consequences of this process are apparent in the capital city of Santo Domingo, which lacks both a sewer system and a means for disposing of garbage in a

minimally environmentally sound way. The lack of a sewage system is a problem in all of the cities of the DR, with the partial exception of Santiago, and in the rural areas of the country. The scale of Santo Domingo (about 2.5 million people) compounds all of the problems. The existence of large settlements consisting of fragile homes perched on the very edge of the Ozama River, built on the consolidated accumulation of garbage, is the most visible symptom of a multitude of problems rooted in poverty, rural and urban, at both the micro and macro scales.
Environmental insecurity in Santo Domingo is often at the center of political turmoil that occasionally turns to violent confrontation between the police and military and mobilized citizens. During the Cold War, there was concern about the possibility of guerrilla warfare on the Cuban model. But the Dominican poor are generally conservative, and a guerrilla movement never materialized in the Dominican Republic.

On the other hand, powerful popular organizations have developed in Santo Domingo and other urban areas, and many deaths have resulted from sporadic protests usually related to economic demands but often also tied to living conditions in urban environments. For this reason, should conditions deteriorate due to accumulated stresses or a natural disaster, the possibility of political instability related to the linkage between poverty and environmental degradation cannot be precluded.

VI. ONE ISLAND, TWO NATIONS

Haiti is an important variable in the Dominican Republic's environmental security equation. Hispaniola is the *only* island in the world encompassing two independent nations. United by geography and ecology, the two sides of the island are separated by divergent histories; a background of war, occupation, and genocide; racial, linguistic, and cultural differences; flare-ups of mutual suspicion and antipathy; and striking differences in levels of development and environmental conditions.

This volatile mix exploded in 1937 when the dictator Trujillo carried out a massacre of 15,000 to 20,000 Haitians living along the DR side of the border. Historians agree that racism, nationalism, and the desire to deflect latent conflict over Trujillo's tyrannical rule toward a "foreign" enemy (although many of the victims were born in the Dominican Republic) all played a role in motivating the killings. Although the 1937 massacre took place on or near the border, it was directed from the central government and did not spring from tensions on the border itself, where a binational economy, society, and culture had been forming for many years (Turits 2003). Similarly, although there are sporadic tensions on the border today, there is also a substantial level of commerce, contact, and even some emerging cooperation across national frontiers. The border, long-neglected by the governments in Santo Domingo and Port-au-Prince, is not the main focus of Dominican-Haitian tensions today.

However, there are other sources of potentially serious conflict. Asked whether he agreed with some interviewees that Dominican-Haitian relations constitute a "time bomb," one prominent Dominican intellectual who has written on the subject said: "It is a ticking *atomic* bomb."

Immigration (resulting partly from environmental devastation in Haiti) and natural resources, especially trees, are at the center of Haitian-Dominican tensions today. Haitian migration to the Dominican Republic has a long history, dating at least back to the early twentieth century. For decades, the Dominican government collaborated closely with the sugar growers and Haitian political and military authorities in the recruitment of Haitian workers for the sugar harvest. Both sugar growers and government and military officials profited handsomely from this human trade.

Indeed, Haitians on the sugar plantations were not affected by the 1937 genocide. Haitian cane cutters provided cheap labor to the mills and were confined to the sugar complexes, where they were often cheated out of their meager earnings and subjected to coercion.

Although the Dominican government no longer participates in recruitment, many of the elements of this labor system remain today, and sporadic reports in the media or by humanitarian groups frequently denounce it as a modern form of slavery. But the phenomenon of the Haitian presence today is more complex, diverse, and pervasive than in the recent past.

While Haitians still cut cane in the Dominican Republic, they perform many other jobs as well, not only in agriculture but also in construction, services, trade, and other occupations. As a result, the Haitian-origin population is not confined to a few sugar complexes but now resides in a large swath of the rural and urban Dominican territory. There has sprung up a "Little Haiti" in the Dominican capital, and there are significant numbers of Haitians in other Dominican cities.
The increase in the intensity of contact between Haitians and Dominicans may in some cases lead to improved communication, but reports of prejudice by Dominicans against Haitians and abuse of Haitians by Dominicans are more frequent than evidence of cooperation. Although most Dominicans state that Haitians do the jobs Dominicans no longer are willing to perform, competition for access to scarce services and amenities in degraded urban environments may prove a more serious source of future tensions than job competition.

While Haitian protests over their mistreatment in the Dominican Republic traditionally have been non-existent or muted given high levels of intimidation and the undocumented status of a substantial percentage of the Haitian-origin population, three factors may contribute to a change in the foreseeable future.

First, a growing number of recent Haitian immigrants to the Dominican Republic are of urban rather than rural origin. Many of these new immigrants reside in urban areas and have relatively more freedom than their predecessors confined to the *bateyes* of the sugar enterprises. These conditions present a more favorable climate for mobilization in defense of rights.

Second, there are a growing number of persons of Haitian origin born in the Dominican Republic. Dominican authorities often deny essential identity cards to this population of Dominican-Haitians, many of whom have never been to Haiti and some of whom are not fluent in Haitian Creole. A movement to advocate for the rights of Dominican-Haitians has developed during the last decades, with significant leadership and international recognition.

Third, the globalization of human rights and the DR's need for increased integration into the international system should provide increasing leverage for advocates for the rights of Haitians in the Dominican Republic. Recent changes in Dominican legislation, however, appear to signal the intent of de-nationalizing Dominican-Haitians (rather than integrating them) by instituting a citizenship regime based on the "right of blood." A massive deportation of Dominicans of Haitian origin is likely to trigger the kind of international condemnation that a country dependent on tourism can ill afford. The alternative would entail the creation of a permanently marginalized population with no stake in the Dominican Republic, a group likely to become a "dangerous class." Unfortunately, at present there does not to appear to be any plan to deal with the reality of an enduring, large-scale Haitian presence through integration and inclusion.

Table 8
Haitian Population in the Dominican Republic

PERCENT BY GENDER	
Male	76
Female	24
PERCENT LESS THAN 30 YEARS OF AGE	
Male	64
Female	54
RESIDENCE IN HAITI (PERCENT)	
Urban	61
Rural	39
HOW MANY TIMES IN DR (PERCENT)	
One	48
Two or more	52
PERCENT WITH DOMINICAN DOCUMENTATION	
	16
REASONS FOR MIGRATING FROM HAITI TO DR BY PERCENT	
Availability of Employment	91
Higher salaries	90
Better working conditions	91
Geographical proximity	76
Economic problems	67
Better business opportunities	29
Family reunification	27
Citizen insecurity	20
Political instability	18

Source: FLACSO 2004

If environmental devastation in Haiti is one of the ultimate sources of Dominican-Haitian tensions resulting from immigration, there is an even more direct link in the form of Haitian incursions into Dominican lands in order to obtain wood to produce charcoal, vital to the survival of the population of Haiti. The depressed state and governmental neglect of the border fuels emigration; some Dominicans fear that depopulation of the border is leaving a vacuum that could be filled by Haitians who will cut the remaining forests.

Despite efforts at reforestation, only about one percent of Haiti's forest cover remains, compared to about 28 percent in the Dominican Republic. "People say Haitians are poor, unfortunate souls," a military officer charged with environmental protection said. "It's true, but even if they are poor, unfortunate souls we are not going to allow them to prey on our environment."

The impact, real and potential, of one nation on the environment of the other is not only in one direction. The headwaters of the Artibonite River, the main source of water for crucial rice cultivation in Haiti, are in the Dominican Republic. Deforestation on the Dominican side threatens to dry up this vital resource for a desperately poor nation. The construction of dams on the Dominican side could also diminish the flow of water into Haiti.

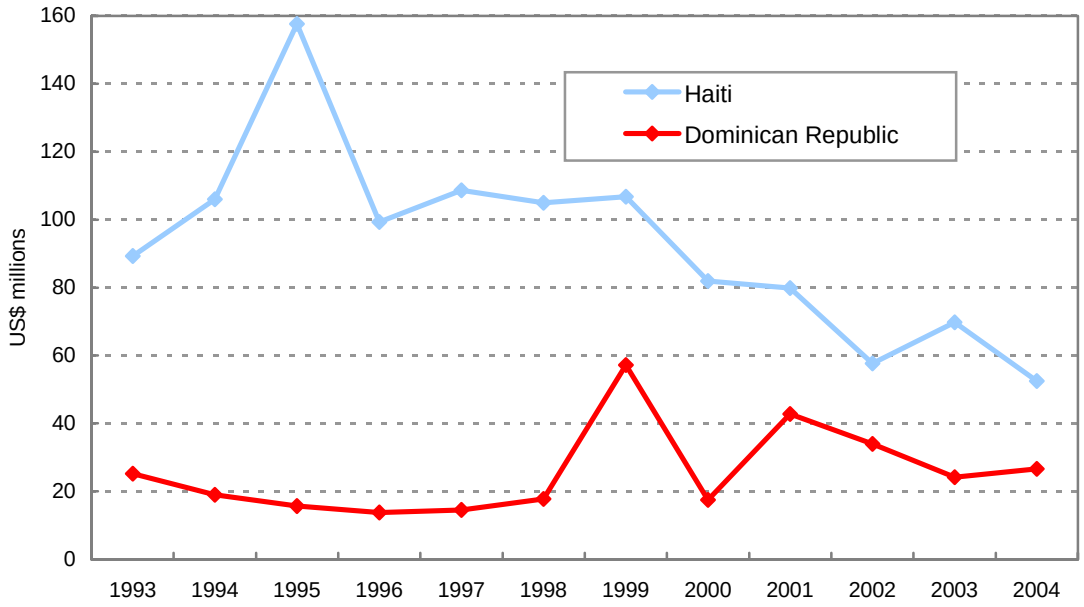
One of the more hopeful recent developments is the collaboration of Dominican environmentalists and civil society groups with Haitian partners in a variety of modest projects, including reforestation efforts. Some Dominicans see the environment as an issue that could

produce rare common ground between sectors of Dominican and Haitian society. Such efforts, which are encouraged by international donors, are still incipient. They also have been hampered greatly by the turmoil and power vacuum in Haiti.

How much the Dominican Republic can do to help reverse environmental disaster in Haiti is open to question, even if hostile relations and feelings can be set aside for a common interest. The Dominican Republic has been making strides to curtail and reverse environmental degradation within its own borders. But it is an uphill struggle; some Dominican environmentalists believe the situation is deteriorating faster than it did in Haiti before it hit bottom. Significant spillover of the process of environmental destruction from the Haitian to the Dominican side could tip the balance in a negative direction. Conversely, a deterioration of the Dominican economy would impact Haiti, given the hundreds of thousands of Haitians who depend on jobs in the Dominican Republic.

As shown in the chart below, repeated crises in Haiti have been costly to the United States, requiring levels of foreign aid that have far surpassed assistance going to the Dominican Republic. From 1993 to 2004, U.S. foreign aid to Haiti was $806 million more than that to the DR. Moreover, Haiti's precarious situation has required at times the deployment of military personnel, which presents a more serious diversion of assets in the current context than in the 1990s.

Table 9
US Foreign Aid to the Dominican Republic and Haiti
US$ in millions, 1993 – 2004*



	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total ('93-'04)
Haiti	89.3	106	157.6	99.3	108.6	104.9	106.8	81.9	79.9	57.7	69.8	52.4	1,114.3
Dominican Republic	25.2	19	15.7	13.8	14.5	17.7	57.2	17.5	42.8	34	24.1	26.7	308.2

Sources: The USAID U.S. Overseas Loans and Grants, Obligations and Loan Authorizations Greenbook, http://qesdb.cdie.org/gbk/index.html; USAID Dominican Republic Congressional Budget Justification, http://www.usaid.gov/policy/budget/cbj2005/lac/dr.html; USAID Haiti Congressional Budget Justification, http://www.usaid.gov/policy/budget/cbj2005/lac/ht.html

In contrast, the relative stability of the Dominican Republic and its progress toward representative democracy and a more prosperous economy during the last decade raised hopes that even the poorest countries of the region could join together with the United States and Canada in a hemispheric association of democratic and truly developing nations.

The fate of the Dominican Republic and Haiti are increasingly intertwined. The future of these two nations historically has been a matter of concern for the United States, and they continue to be important to U.S. interests. While the United States understandably has focused a great deal of attention on Haiti in recent years, the success of the Dominican Republic may be as important to the United States as the rescue of Haiti.

* Figures for 2004 are estimates.

VII. SCENARIOS: ENVIRONMENTAL SECURITY IN THE DR 2005-2015

The trends in variables with significant direct and/or indirect impact on environmental security are complex and sometimes contradictory, suggesting a range of possible futures from relatively favorable to very unfavorable. In the following section, we describe three possible scenarios for the Dominican Republic over the next decade.

The Best Case Scenario

A key aspect of a best case scenario would be a return to economic growth rates like those experienced in the "Dominican miracle" of the 1990s, but this time with a more equitable distribution of income gains and a lower environmental impact. While at least one leading Dominican economist, José Luis Alemán, believes the optimal sustainable rate of economic growth for the Dominican Republic today is somewhat lower than that of the golden years, it is clear is that a relatively high rate of economic growth with reduced income disparities would diminish pressures that produce unsustainable environmental practices. Growth also provides the state with increased resources for environmental protection, including enforcement and monitoring, and produces more favorable trade-offs for business, specifically in regard to short-term profit versus long-term sustainability. Economic growth with equity would tend to diminish social conflict and political instability, including conflict and/or instability related to natural resource competition and other environmental variables. In the best case scenario, the Dominican Republic once again would become a model of economic growth, this time with more broadly shared benefits and increased sustainability.

A second important component of a best case scenario, one essential to the hope of a sustainable and dynamic economy, would witness the Dominican Republic changing the structure of its key growth industry from a model based on mass tourism and cheap rates that produces major adverse environmental impacts (particularly in fragile coastal areas) to a model based on fewer visitors, higher expenditures per tourist, and more diversified tourism (including cultural tourism, adventure tourism, hiking, mountain climbing, and scuba diving). Under this aspect of the best case scenario the Dominican Republic would become established as a model example of sustainable tourism development, "a Costa Rica of the Caribbean."

A third element of a best case scenario would involve the institutional development and consolidation of environmental governance and of legal mechanisms for protection and enforcement. The best case scenario would promote civic and private-sector participation by making the Environmental Council and Fund created by Law 64-00 operational as well as by implementing an effective decentralization of environmental management functions, including the local environmental units (Unidades de Gestión Ambiental Municipales, UGAMS). This would require an increase in the level and quality of human and material resources for SEMARN and the development and implementation of land use plans for the nation as well as for the regions, provinces, cities, and towns.

The Dominican Republic is prey to both hurricanes and earthquakes, as well as to major floods. Under a best case scenario, hurricanes and earthquakes during the next few years would be of average or less frequency and intensity and the institutional capacity to mitigate disasters would continue to increase, at a faster rate than in the recent past.

Sewage and solid waste management is woefully inadequate and an ever-growing problem in an increasingly urban society with a population still growing at a substantial, if decreasing, rate. A best case scenario would see at least the beginning and early phases of a significant shift from the septic tank systems (or the total lack of sanitation systems), which is now the norm, to a piped

sewage system with adequate and operational waste treatment capabilities. A second component would be the development of a solid waste management strategy and a shift from *vertederos* (dumps) to modern lined sanitary landfills.

A best case scenario entails a multifaceted attack on the problem of water. Water is a problem in the Dominican Republic from several perspectives, including quality, access, waste, and a looming problem of scarcity. Deforestation that dries up the rivers, the absence of land use planning, wasteful irrigation, and salt water intrusion are major threats to the country's water supply. A Dominican policy advisor interviewed during the course of this project said: "The water crisis in ten years will make today's electricity crisis seem like nothing." While the Dominican government has improved the population's access to water significantly in recent years, investment in the construction of water delivery systems have dwarfed investments to ensure water quality. Consequently, while water in Santo Domingo and Santiago generally meets international standards from the standpoint of biological agents, that is not the case in the rest of the country, where there continues to be a high rate of water-borne illnesses. Even in Santo Domingo, there is no monitoring of non-biological contaminants, and the massive disposal of sewage through septic tanks threatens the aquifer. Moreover, the use of water for irrigation is still too often excessive, and the price charged does not reflect the real cost.

Under the best case scenario, there would be a better balance between highly visible and politically popular investments to increase water access and expenditures to ensure water quality. One of the problems with accomplishing this goal as identified by our interviewees is the politicization of water management and the use of construction to grant large profits to large economic interests. The institutionalization of professional management of water and a focus on improving quality and reducing diarrheal diseases would be the priorities under a best case scenario, along with the rationalized use of water based on real costs and a decrease in waste.

Haiti looms large in relation to Dominican environmental security. A best case scenario necessarily would require significant political stabilization, renewed economic development, and increased environmental security in Haiti. In recent years there has been increased trade and general economic interdependence between the Dominican Republic and Haiti, which recently has been disrupted by the ongoing crisis on the western side of the island. A solution to the Haitian crisis could lead to positive synergies and cooperation between the Dominican Republic and Haiti, leading to increasing trade, dialogue, improved environmental practices, a quickening in the pace of economic development in the border region, the beginning of multiple destination tourism, and cooperative and sustainable binational management of the Artibonite watershed.

Corruption undermines environmental security through a number of mostly indirect mechanisms. For example, recent massive corruption in the banking sector triggered a major economic crisis that reduced the capacity of the state to focus on and finance environmental security measures. Corruption also undermines environmental security when it blunts the enforcement of environmental laws. Under a best case scenario, the objective recently announced by Dominican President Leonel Fernández of making the country a model for anti-corruption and transparency in the Caribbean would succeed, with the environmental ministry leading the way.

There are well over a million Dominicans in the United States, including a rising second-generation of Dominican Americans with more education, higher income, and more access to political power than their parents. Their remittances are a key resource for the Dominican economy at the household and national level. Under a best case scenario, the contributions of Dominicans abroad would increase and diversify, including new investments in environmentally sustainable development projects, new inputs of know-how and capital, and the encouragement of

a priority status for the Dominican Republic in terms of assistance and cooperation by American NGOs and U.S. local and federal governments, including disaster mitigation and relief.

Although it is of decreasing importance, slash and burn agriculture continues to inflict a toll in the Dominican Republic, as does production for domestic consumption based on excessive irrigation or other unsustainable practices. Under a best case scenario, slash and burn agriculture would be eliminated or greatly reduced by managed forestry and better agricultural practices, and there would emerge a shift toward a new model of agriculture based on competitiveness in the global market.

Under a best case scenario, Dominican Republic would steadily diminish its extremely high dependence on imported oil, replacing it with wind, hydraulic, biomass, solar and other forms of renewable energy. Under this scenario, the Dominican Republic would continue to receive preferential terms for oil purchases from richer Latin American oil-producing countries.

Finally, with poverty, inequality, and unemployment as major problems, the best case scenario would include the emergence of new, clean industries offering higher-wage employment opportunities, such as in the digital/high-tech sector and/or in biotechnology.

The Worst Case Scenario

Under the worst case scenario, nature would play cruel tricks on the Dominican Republic in the form of natural disasters of increasing severity and frequency. As Florida experienced four major hurricanes in 2004, Dominican Republic under a worst case scenario would suffer from several major hurricanes during the next decades, including some in the same season, as well at least one major one affecting Santo Domingo. There would also be, under this scenario, a major earthquake affecting one of the two major hurricane areas. These natural disasters, which would result in massive casualties and great property loss, would expose the inadequacy of building codes, evacuation plans, and relief capacities, reducing the legitimacy of the government and leading to political instability and street mobilizations.

In the worst case scenario, GDP growth would be slower than population growth, resulting in increasing impoverishment, greater stress on natural resources, reduced resources for environmental management and disaster mitigation, increased undocumented migration, and political instability. Combined with highly visible corruption scandals, some involving the despoiling of natural resources (including protected areas) in the interest of unsustainable tourist development, economic decline and unrest would undermine the legitimacy of the political system itself rather than merely a specific government.

In the worst case scenario, the inability of successive governments from all of the major parties to solve the worsening crises would implode the party system and promote various strands of populism as well as threats of military rule.

Another component of a worst case scenario would be a reversal in the growth of the tourism sector. This could come as a result of the myriad environmental problems associated with overdevelopment and the emergence of Cuba and/or other destinations as powerful competitors for tourists. This would undercut one of the country's economic pillars, increase unemployment, and promote a race to the bottom in the tourism industry in which sustainable practices would be considered an unaffordable luxury.

A greater deterioration of the situation in Haiti would contribute to a worst case scenario in numerous ways. First, it would promote increased migration of Haitians to the Dominican

Republic, perhaps outstripping labor market needs and straining ethnic relations. Second, the dire situation of Haitians would force greater numbers to cross over for the purpose of obtaining wood and not only along the border, increasing deforestation deeper and deeper into the Dominican Republic. If this situation led to Dominican repression of Haitians and violent inter-ethnic conflict in the cities and on the border, this would worsen the Dominican Republic's risk profile and decrease foreign investment and tourism. It might also trigger inter-state conflict between the Dominican Republic and Haiti.

Under a worst case scenario, the Dominican Republic would begin to experience a worsening water shortage within the next ten years. Water shortages would have multiple negative effects for development, environmental security, and human security. Food security would become a problem as the cost of staples rose above the level affordable for a growing percentage of households, triggering major protests and disturbances. The lack of water in the urban slums of Santo Domingo would further fuel strife. The scarcity and increasing cost of water also would have negative consequences for tourism as the water supply is most critical in tourist areas in the east of the country. The poor quality of water would continue to take a toll on Dominicans and some tourists as well, hurting that key industry.

A component of a worst case scenario might involve a continued increase in violent crime, the drug trades and money laundering, which would in combination would erode citizens' security, undermine the legitimacy of the state, and scare away tourists. With declining economic, social and security circumstances, the Dominican Republic could also become a very attractive and low-risk haven for transnational criminal activities. Unforeseen events, such as an epidemic or a hurricane affecting the tourist areas and causing major casualties could have parallel effects.

The free trade zones are one of the pillars of the Dominican economy. But increasing competition from Asia, especially the massive entry of China into the U.S. market, threatens the viability of the sector. If Dominican free trade zones fail to integrate into the evolving global market, this will decrease employment, cut into the resources available for environmental security activities, and increase the likelihood of social and political unrest.

International migration has been an increasingly important escape valve for the Dominican Republic over the last 40 years. Recently, however, the number of Dominican immigrants admitted into the United States has been declining, and the number of Dominicans deported back to the DR has increased sharply. If this trend toward decreased net legal migration to the United States intensifies or if the call for an immigration moratorium by anti-immigration advocates in the United States succeeds, there would be major adverse consequences for the Dominican Republic. The legal immigration crunch might trigger an increase in unauthorized migration. Already, the return of criminals adds to the problem of rising citizen insecurity. In a worse case scenario, remittances would drop steadily, creating serious economic and political problems.
The worst case scenario is one in which the country's energy problems worsen significantly in several respects. First, the country would continue to rely almost completely on imported oil and there would be a drop in hydroelectric generation resulting from the silting of dams. Second, as demand for oil rises with rapid economic development in China, India, and other oil-importing countries, oil prices would rise steeply over the next decade. Oil-producing Latin American countries might decrease their subsidies to the Dominican Republic as the revenues lost from such generosity increased.

Finally, a worst case scenario might include a current problem unexpectedly becoming much more acute, for instance a steadily rising rate of HIV/AIDS, which would drain government resources and sap tourism.

The Intermediate (and Most Likely) Scenario

The experience of the Dominican Republic since World War II suggests that periods of economic contraction and periods of surging economic growth, such as the late 1990s, are the exception, while the norm over the long haul and the most probable future trajectory is a positive rate of growth moderately above the rate of population growth. The continuing drop in birth rates may contribute to a somewhat steeper increase in GDP per capita than in earlier periods.

In the intermediate scenario, the free trade zones would plateau or decrease moderately as some old industries are replaced by new ones, allowing employment growth in other sectors to compensate for losses in the free trade zones.

The most likely scenario is for the water shortage to affect the country selectively, with supplies to the two main urban areas continuing but some sporadic shortages, especially in slum areas, while the water supply problem becomes acute in some rural regions. This disparity would continue to fuel migration, swelling the urban slums and increasing the potential for conflict.

The pattern of tourism development under this model would be mixed. “Slash and burn” tourism would continue to expand, although with a better mix of sustainable and alternative forms of tourism. Decreased supply of fresh water in tourist areas would limit the growth of mass tourism and encourage alternative and high-end tourism.

Environmental governance would gradually improve under this scenario, including strengthening of the Environmental Police, with predictable setbacks during periods of governmental transitions and unpredictable setbacks resulting from changes in the governing styles of different leadership groups. With democracy increasingly consolidated, civil society groups would gradually move from such concerns as electoral monitoring toward a concern for monitoring and advocacy in relation to the environment. An environmental culture would begin to develop and take root among the general public. Some forms of environmental degradation would be stopped or reversed; others would be slowed or mitigated.

Legal immigration of Dominicans into the United States would continue at a significant rate (approximately 20,000 a year), albeit substantially lower than the peak rate (approximately 35,000 a year) during part of the 1990s. Remittances would continue to increase (but at a decreasing rate) for several years before peaking and beginning to decline gradually. The flow of undocumented Dominicans to the United States and of deportations to the DR would fluctuate within manageable parameters for both countries.

Haitian immigration would continue and there would be further diversification in their labor market participation. Relations between Haitian immigrants and Dominicans would show a mixed pattern, with continuing tensions and instances of conflict as well as dialogue and cooperation, but no massive repression, deportation, or violence. However, a comprehensive effort to integrate and regularize the legal status of Haitians would not occur. Therefore, the contradiction between the Dominican economy’s increasingly structural (and not merely cyclical) reliance on Haitian workers and the near total cultural and civic exclusion of Haitians in the Dominican Republic would sharpen.

The overwhelming reliance on fossil fuels for energy generation would decrease only modestly, and the oil bill would prevent the Dominican economy from sustaining the economic growth rates of the 1990s. The electricity crisis would be alleviated with increased collections and rationalization of the sector, but the government would be forced to maintain substantial subsidies, and there would remain occasional blackouts and possibly short-term or local crises.

During the course of a decade, several major natural disasters could be expected to take place in the Dominican Republic with substantial loss of life and property damage. Whether a massive, transformational disaster would take place is unpredictable. However, the capacity of the Dominican state to deal with "normal" disasters would continue to improve incrementally over the decade.

VIII. CONCLUSION: TRANSFORMATIONAL DEVELOPMENT OR TOWARD A VULNERABLE STATE?

The contrasting futures alluded to by the subtitle of this report—one of promise or one of peril—both reflect plausible outcomes for the Dominican Republic. Despite occasional reversals, economic growth has been the rule rather than the exception in the DR over the past half a century. The remarkable rate of economic growth of the 1990s might represent the harbinger of a more prosperous future. At the same time, the strengthening of democracy over the past 15 years, as demonstrated by the alternation of power among the country's three leading political parties through an increasingly legitimate and transparent electoral process, has helped to advance the country's credentials as an example of the spread of political and economic freedom in the Western Hemisphere. Most recently, the current president, an energetic political leader with a modern style and vision, appears to have assembled a highly competent economic team and embarked on policies that have stabilized the currency and renewed crucial external assistance in a remarkably short time.

Yet, there are sufficient reasons to question whether the Dominican Republic has definitively turned the corner. The growth of the 1990s, less broadly shared than many would have hoped, did not significantly decrease the proportion of the population living in poverty. The sudden and stunning blow to the DR's economy resulting from the 2003 BANINTER banking scandal and subsequent bailout led to sharp increases in indebtedness and the cost of living, while putting into stark relief the country's continuing vulnerability to high-level corruption. Serious questions about the quality of Dominican democracy emerged from the inability of the justice system to bring to account those responsible for the abuses of the banking system. A drumbeat of reports concerning drug trafficking, including several that appeared to implicate both civilian and military officials, raised fears that criminal elements have the ability to influence or control state powers.

The central thesis of this report is that the lack of a strategic focus on environmental and natural resource issues, in the context of the country's complex political and economic dynamics, presents a possible threat to the stability and security of the Dominican Republic. The multiple links between the United States and the Dominican Republic documented at the outset of this study—especially with respect to drugs, immigration, support in fighting terrorism and transnational crime—as well as the DR's strategic geographic position on the "third border" of the United States, indicate that an unstable Dominican Republic is a potential threat to U.S. interests and security.

There are many environmental problems in the Dominican Republic, but we have centered our analysis on issues that are likely to contribute to instability in the absence of significant changes in public policy and/or private behavior. The consequences of irrationalities in land use and the near absence of land use planning and management policies were less serious in an earlier era of low population density and abundant land. Today, the impact of environmentally unsound practices and the depletion of finite resources are becoming ever more apparent in land

degradation, the deterioration of marine and coastal areas, diminishing water supplies, and increasingly polluted and unhealthy urban areas. While the transition to a new model of agriculture based on nontraditional exports is in its early stages, the traditional reliance on the domestic production of rice and beans using unsustainable techniques continues to result in the inefficient and excessive use of water for irrigation as well short-sighted land conversion practices.

With the future of the free trade zones in doubt, agriculture in flux, and the benefits of global integration through the more intensive use of information technology yet to be realized, tourism stands out as the likely engine of growth for the DR over the short to medium term. Indeed, the immediate growth prospects are excellent. Yet, as has been discussed, there are a host of concerns associated with the current tourism model that call into question its sustainability, including the lack of infrastructure, inadequate sanitation facilities, saltwater intrusion, weak regulatory enforcement, and lack of preparedness for natural hazards.

Given the key role of tourism and the urgent need to surmount the effects of the recent crisis and restart economic growth, the Dominican government might well be tempted to take an overly optimistic view of what the future of the sector is likely to be in the absence of actions to address threats that loom on the not-very-distant horizon. Such a short-sighted approach might result in some immediate political benefits but undermine the long-term strategic goals of the nation.

The passage of Law 64-00 and the establishment of the Secretariat of the Environment and Natural Resources in 2000 were important milestones in advancing environmental governance in the Dominican Republic. It is hardly surprising that a new ministry such as SEMARN should have problems of institutional capacity, but it is urgent that they be addressed in the next four years by the new government. At the same time, as the long debate over the Protected Areas law and the recent legal proceedings in the controversy over the illegal importation and dumping of "rockash" from Puerto Rico have demonstrated, SEMARN will need institutional strength and presidential backing to resist powerful political and economic interests seeking private gain at public expense. Similarly, only with support from the executive will SEMARN be able to hold its own in interagency policymaking and in its effort to make environmental and natural resource issues cross-cutting policy concerns throughout the government. SEMARN will be tested as well in terms of its enforcement capacity, and the recent strengthening of the Environmental Police is an important step in the right direction. It also opens the way for the Dominican military to reverse negative public perceptions about its relationship to the environment and to give tangible support to the protection of the national patrimony.

One of the main vectors of the environment-security linkage is located at the intersection of resource scarcity, poverty, and social conflict. Absent a public perception that government is actively seeking solutions, the deterioration of living conditions and the persistence of poverty in Santo Domingo and other urban areas have the potential to contribute to instability. There are no silver bullet solutions for either of these problems, but as one of our informants, an official from a major donor organization, put it, there are number of "low-hanging fruits" in terms of the provision of basic sanitation that should not be missed because of the diversion of money to splashier megaprojects. Especially in terms of political stability, "all politics is local," and steps to address issues of waste disposal, water quality, and threats to public health can provide immediate benefits to crowded and impoverished neighborhoods and provide the political legitimacy necessary to carry out more ambitious reforms.

Unfortunately, as one high-ranking Dominican government official stated, "there is really no basis to be optimistic about Haiti." This means that migratory—and environmental—pressures on

the Dominican Republic will continue to spill over from Haiti for the foreseeable future. Dominican actions in the headwaters of the Artibonite River may also negatively impact the main rice-growing areas of Haiti. The expression we have used in this report -- one island, two nations -- is not our invention but a term of common usage. Yet, to date, there are only a few initiatives on the part of either the Dominican government or the international donor community to address the inescapably binational character of many of the environmental problems afflicting Hispaniola. The few private sector binational initiatives, such as the Grupo M garment plants in the border free trade zone (San Martin 2003) are promising but are seen by some Haitians as Dominican exploitation of cheap Haitian labor rather than binational economic development.

The lack of attention to this quite evident binational reality can only produce suboptimal outcomes and, albeit unintentionally, reinforce zero-sum attitudes about the respective interests of Dominicans and Haitians. Binational cooperation on programs for environmental protection (or restoration) and sustainable livelihoods has the potential to decrease tensions and increase security on Hispaniola.

The wild card in any assessment of environmental security in the Dominican Republic is natural hazards. The possibility of the country being hit by several hurricanes and an earthquake in a short time span may be relatively low, but it is not implausible. That the DR will face hurricanes on a fairly regular basis is a certainty. The DR faces many challenges in disaster preparedness, mitigation, and response, but two key areas where progress must be accelerated are decentralization and integration of civil society. Remote communities need both better information and communications and basic resources to improve their disaster response capacity. The National Emergency Commission is just beginning to interact with NGOs who have extensive community experience and relevant expertise. But this is a dialogue and partnership that can be productively advanced more rapidly. As a matter of stability and security, much depends on the perception of citizens that in the event of a national catastrophe the state will respond vigorously, effectively, and with integrity. It is questionable whether the Dominican state presently has the capacity to ensure that level of public confidence in the severe circumstances that may arise as a result of a major disaster.

At the beginning of the new century, and especially in light of the advances of the 1990s, most observers would have placed the Dominican Republic in the “safe” category for developing countries. In the parlance of a recent USAID white paper on U.S. foreign aid challenges for the twenty-first century (USAID 2004), the Dominican Republic would have been seen as a candidate par excellence for “transformational development.” Transformational development, according to the paper, “transforms countries through far-reaching, fundamental changes in institutions of governance, human capacity, and economic structure that enable a country to sustain further economic and social progress without depending on foreign aid.” While the DR remains a country suitable for transformational aid, the economic reversals and precipitous loss of public confidence from 2002 to 2004 left the country, as President Fernández has put it, “like a patient in intensive care.”

A major lesson of the past two years in the Dominican Republic is that the distance that separates sustained progress and calamitous reversal can be unexpectedly small. Indeed, as the latest USAID white paper on fragile states points out, it is often “more important to understand how far and quickly a country is moving from or toward stability” than to categorize it in one way or another (USAID 2005). From early 2003 to mid-2004, the Dominican Republic moved quite rapidly toward the unstable pole of the continuum; since that time the country has been making steady progress toward regaining stability.

The threats to environmental security identified in this report, if left unattended, and especially in combination, clearly have the *potential* to destabilize the Dominican Republic. As Dominican civilian and military leaders acknowledge, protecting the environmental and natural resource base is not merely a normative goal but is also key to enhancing Dominican national security. What will happen if the economy's leading sector, tourism, falls into decline or collapses? How much longer can the country afford the costs and losses of misguided or nonexistent land use policies? What will people do in the face of severe water shortages? How much stress can the social fabric sustain in terms of poverty, narrowly shared economic growth, environmental degradation, and Dominican-Haitian tensions? What will the reaction of the population be to poorly coordinated or ineffectual government responses to a series of natural disasters?

Each of these questions—and possibilities—implies that there is a tipping point at which public attitudes shift, the ability of the state to provide basic services and security comes into question, and the very legitimacy of the government gives way. At that point, in the terminology of the fragile states white paper, the transformational development state becomes instead a "vulnerable" state, with all the negative consequences that entails for the country itself and for the international community.

No one knows exactly where the tipping points lie. But few who observed developments in the Dominican Republic during the most recent economic crisis will doubt that only a year ago the nation was spinning dangerously toward vulnerability. The challenge now for the Dominican government, civil society, and the international donor community is to ensure that actions in support of environmental security are implemented quickly and effectively in order to move the country away from the potential dangers of instability and conflict and toward a path of sustained development.

IX. RECOMMENDATIONS

Based on our findings we make the following recommendations:

To the government of the United States (USG):

1. In developing and implementing its policies, the U.S. government should take into account the increasingly strong linkages between environmental degradation, the management of natural resources, and national security in the Dominican Republic. Policy areas informed by these considerations should include:

    a) Development assistance

    b) Loan conditions

    c) Military cooperation

    d) Immigration policies

2. In the context of U.S. national interests and security concerns, the United States Agency for International Development (USAID) should support efforts to improve the capacity of the

government of the Dominican Republic to halt or reverse environmental degradation, prepare for and respond to natural disasters, and sustainably manage natural resources by:

a) Supplementing and refocusing current USAID environmental programs aimed at strengthening government institutions and civil society organizations with a new emphasis on strategic aspects of environmental security, especially land use management, sustainable tourism, and natural hazards.

b) Helping to accelerate the development of land use policies, watershed management, and coastal and marine protection at the national, provincial, and municipal levels.

c) Adjusting policies to allow support of binational programs that enhance environmental security in both the Dominican Republic and Haiti, especially in relation to the Artibonite watershed and other shared resources, as well as in the areas of joint reforestation projects, environmental education and advocacy, and binational tourism.

d) Supporting current Ministry of the Environment and Natural Resources (SEMARN) efforts to coordinate and mainstream environmental policies among key ministries and agencies of the Dominican Republic, including tourism, finance, and transportation, especially through the Tourism Cabinet.

e) Encouraging and supporting wide public involvement and participation in developing the country's environmental agenda as a national priority, specifically by supporting the activation of the Environment Council established in Law 64-00.

f) Supporting the decentralization of disaster response capacity in the Dominican Republic through community-level projects to provide people with basic resources, including flashlights, first aid kits, emergency communications capabilities, and food rations. Soliciting the active support of Dominican-American organizations and the Dominican private sector should be part of these efforts.

g) Working with the National Emergency Commission of the Dominican Republic to develop evacuation plans for high risk areas, such as Santo Domingo, Santiago, and the east coast tourist corridor. These plans should clearly outline which authorities are responsible for which tasks and with whom they are to coordinate their efforts.

3. Working through the office of the Defense Attaché in Santo Domingo, the USG should meet with the head of the Environmental Police on an ongoing basis to develop steps to provide technical assistance to strengthen the Environmental Police in collaboration with such U.S. departments and agencies as the Department of Defense, Environmental Protection Agency, and the Department of the Interior.

4. Focusing military-to-military relations on issues of military support to civil society, including disaster relief and mitigation.

To the Government of the Dominican Republic (GODR):

1. The GODR should declare environmental security a component of national security and establish it as a strategic priority for the country. Emerging threats to environmental security should be addressed by:

a) Developing a strategic plan for sustainable development in the Dominican Republic, with emphasis on land use planning and sustainable tourism.

b) Gradually shifting focus, training, and resources away from conventional defense and toward civil defense and environmental enforcement and protection.

c) Consolidating professionalism and a sense of identity and mission in SEMARN through adequate funding and support, including:

- Programs, personnel (including the Environmental Police), and training.
- A dedicated building for SEMARN.
- Political support in debates with other ministries.

d) Developing and promoting SEMARN, the newest ministry, as a model of sound management, transparency, and integrity as a key part of the broader priority of reform of the Dominican state.

e) Leading by example in applying principles of sustainable development and environmental protection to government projects and investments and by infusing these principles throughout all ministries and agencies of the state and coordinating policies through an active Tourism Cabinet.

f) Ensuring that government policies send consistent signals by actively discouraging such unsustainable agricultural practices as deforestation, hillside farming, and wasteful irrigation.

g) Focusing on the provision of sanitation services in Santo Domingo and other urban areas, especially the collection and disposal of solid waste.

h) Developing a national dialogue and education program to obtain a consensus on the environment as a national priority, including in it green, brown, and natural hazards as key issues, and using it to develop a positive Dominican national identity based on an appreciation of the land and its resources that transcends the traditional negative nationalism based on distinction from and opposition to Haiti.

i) Giving priority to binational environmental security and protection projects, and emphasizing the environment as an area of common interest and positive dialogue between the Dominican Republic and Haiti.

j) Taking steps to obtain at least 10 percent of the nation's energy needs through alternative energy sources such as wind, solar, geothermal, and biomass by 2015.

k) Ensuring the integrity and maintenance of the system of protected areas.

l) Emphasizing the Dominican Republic's commitment to sustainable development in the country's international communication strategy, including interactions with donors and in the marketing of tourism.

m) Introducing an incentive system to encourage builders in high-risk areas to adhere to stricter building code regulations and to encourage building owners to retrofit certain structures that are either at a particularly high risk or are of particularly high value, or both.

n) Setting up official channels for the sharing of natural hazard information between the Dominican Republic and Haiti and among the Dominican Republic, Puerto Rico, and Cuba.

o) Undertaking confidence-building measures at the local level between local communities and government security forces so that people feel safe leaving their homes during natural hazard events.

p) Developing plans to relocate highly vulnerable families (such as those squatting in and around the port at Haina) to areas where they can live safely and also have reasonable access to employment opportunities and other livelihood-sustaining necessities.

2. SEMARN should advance and accelerate the implementation of its mandate under Law 64-00 by:

a) Leading the effort to develop a national strategic plan for sustainable development and emphasizing strategic planning in its own work, including in the development and implementation of environmental laws and regulations.

b) Convening as soon as possible the Environmental Council established by the environmental statute as part of a more comprehensive dialogue to establish the environment as a national priority and foster environmental consciousness as a positive source of national pride and cohesion.

c) Working toward the completion of all sectoral laws and regulations in the environmental area.

To the Dominican private sector:

1. The Dominican private sector should help mitigate the potentially catastrophic effects of natural hazards on economic growth and public safety by:

a) Developing and encouraging the adoption of insurance schemes for publicly held infrastructure at risk.

b) Leading a nationwide program to provide churches and other trusted institutions with radios so that isolated communities can be kept abreast of storm developments that may impact them.

To Dominican civil society:

1. Dominican civil society organizations and interested citizens should promote awareness of and solutions to environmental risks to individual, local, and national security by:

a) Taking actions to create a “Forum on Environmental Security” as suggested by Dominican participants from the public sector, academia, NGOs, and the private sector at

the November 2004 roundtable in Santo Domingo on "Promise or Peril? Environmental Security in the Dominican Republic."

Endnotes

[1] See, for example, Kevin Michael O'Reilly, "The Dominican Republic's 2000 Presidential Election: The U.S. Role in Supporting the Process," *North-South Agenda Papers*, No. 56, North-South Center Press, Coral Gables, FL, April 2002.

[2] The same Presidential Determination singled out Haiti (along with only Burma) as a country "that [has] failed demonstrably during the previous 12 months to adhere to [its] obligations under inter-national counternarcotics agreements." Haiti alone was singled out as a country for whom the provision of counternarcotics assistance was "vital to the national interests of the United States." These concerns were expressed even prior to the crisis the led to the removal of President Jean-Bertrand Aristide and a further deepening of the crisis of governability in Haiti.

[3] According to the World Bank, the rural poverty rate is twice as high (42 percent) as the urban poverty rate (21 percent), and "the distribution of key assets – labor, human capital, physical assets, basic infrastructure, and financial assets including pension and insurance – is highly unequal" (World Bank 2001a, viii).

[4] The early optimism about the Mejía administration can be seen, for example, in "Violent Conflict Vulnerability Assessment for the Dominican Republic," USAID, Santo Domingo, September 2001.

[5] The term "economic activity generated" appears to be a global figure that includes a variety of linkages between the tourism sector and other sectors in the Dominican economy. In April 2005, the Secretary of Tourism, Félix Jiménez, evidently using a more restrictive measure, announced that in 2004, the tourism sector had generated $3.4 billion of which Punta Cana alone generated $1.6 billion (Valenzuela 2005).

[6] However, in a sign of strength and resolve, the Ministry of Environment revoked a permit to build the Bàvaro Beach and Golf Resort granted by the former Deputy Minister due to the resort's expected negative impact on the protected Bàvaro Lagoon (*DR1Daily News. 2004*. Bavaro Resort's Construction Permit Revoked. December 15, 2004. http://dr1.com/premium/news/2004/dnews121504.shtml#9).

[7] A malaria outbreak of 21 cases reported between November 2004 and January 25, 2005 in the Punta Cana/Bávaro area (and in Duarte province), previously deemed nonmalarious, have been attributed to the rains and flooding of Hurricane Jeanne, which provided additional mosquito breeding grounds, and to the "migrant workers [Haitians] from areas where malaria is endemic" (CDC 2005). Events like these, even if limited, can easily harm the country's tourism sector and inhibit economic recovery after a major disaster.

[8] Construction of the highway is currently estimated to cost $40 million (*DR1Daily News*. 2005. New Highways for Punta Cana. April 5, 2005. 2005. http://www.dr1.com/).

APPENDIX I: LESSONS LEARNED FOR THE ENVIRONMENTAL SECURITY ASSESSMENT FRAMEWORK (ESAF)

Conceptual Lessons

The pilot case study of the Dominican Republic strongly confirms the proposition that environmental security analysis requires an interdisciplinary approach that interrelates and synthesizes empirical data, natural science, social science, history, security concerns, and policy processes. With the partial exception of certain "givens" from the natural world (e.g., steep hillsides or vulnerability to hurricanes), environmental and natural resource problems cannot be meaningfully apprehended in relation to security in the form of simple data points or bare facts. In considering problems of water quality and quantity, land degradation, deforestation, coastal pollution, and energy supplies, key questions arise without which the analysis cannot proceed. How did things get to be this way? Whose interests are being served? Whose security is at risk? What is the nature of the threat? At what cost? Over what time period? With what potential for conflict? The answers to these questions require a sound grasp of the structure of economic production, the distribution of power within the prevailing political system, the social composition of the population, the history and culture of the nation, the governance capacity of institutions and authorities, and the aspirations and expectations of leaders and citizens alike.

In terms of the formal structure of the ESAF methodology, the lesson learned (or reconfirmed) from this is the crucial importance of non-environmental factors in understanding the implications of environmental and natural resource problems. As a consequence, future ESAF studies need to devote even greater attention to *Phase I* of the ESAF methodology.

Related to this point, at the outset of this pilot case study, *Phase II* of the ESAF used the concept "critical natural resource" rather than "critical country concern." The intention behind the use of the former term was to anchor the analysis in a tight linkage between environment and security and to distinguish clearly between environmental and non-environmental factors. However, in practice, it was found that this approach tended to obscure or neglect factors that were central to understanding security concerns. For example, no proper analysis of stability and security in the Dominican Republic could be done that did not take into account the problematic nature of relations between Dominican and Haitians. Early in the DR pilot case study, therefore, the methodology adopted the broader concept of critical country concern.

However, this does not in any way diminish the impact and significance of environmental variables themselves. In fact, one of methodological realizations from this pilot case study is that the conventional practice of conceptualizing environmental factors as "intervening variables" in environmental security analysis is inadequate. The term "intervening variable" applies to variables that are independent variables in relation to one specified dependent variable (in the case of the ESAF, security) but are also dependent variables in relation to another independent variable. Thus, to take one imaginable example, political corruption might lead to the award of an illegal logging concession, resulting in deforestation that threatens the livelihoods of forest dwellers, who in turn protest violently against the government. But the case of the Dominican Republic reminds us that environmental variables are not merely intervening but reciprocally interactive with other variables in ways that are not reducible to an "intervening" influence.

The nation's natural resource endowment provides the most obvious example. The Dominican Republic's remarkable coastlines and beaches are driving the transformation of the Dominican economy. The island nation's susceptibility to increasingly dangerous hurricanes is perhaps the single most significant immediate threat to its national security. In each case, the relevant environmental factor is exerting the influence of an independent variable, which in turn may be mediated by other "intervening" variables. The promise of the country's coastal-based tourism will be mediated by the DR's ability to overcome some of its current institutional weaknesses and limited governance capacities. The peril of a major hurricane will be mediated by the country's disaster preparedness and response capacity. Are environmental factors "intervening" variables? The answer, it would seem, is "it depends, sometimes yes, sometimes no." For this reason, it is better simply to acknowledge the shifting position of environmental factors in causal chains related to security scenarios and refer to them as "interactive variables," whose power or influence is bound up with forward or backward linkages with other variables that cannot be specified a priori.

Lessons From the Field Study

Perhaps the most notable lesson from the field study was the degree to which the issues under investigation resonated with both interviewees and ordinary Dominicans. Although the term "environmental security" was not familiar or entirely clear at first to some people, almost all the people with whom we spoke had an immediate sense of the strong relationship between growing environmental problems, the mismanagement of natural resources, and their implications for a secure future for the country. Not infrequently, we heard observations that characterized the current environmental trajectory of the DR in alarming terms. Indeed, "disaster," "collapse," and "catastrophe" were all words that we heard on various occasions. This sense of alarm was matched by a widely shared perception that at all levels the Dominican government is not yet responding to environmental threats with sufficient seriousness and vigor.

The implications of these sorts of sentiments for the ESAF methodology were made apparent in the November 2004 roundtable sponsored by FESS in Santo Domingo. At that event, a diverse group of participants from government, NGOs, academia, think tanks, and the private sector shared perspectives on environmental security threats to the DR in a group discussion that, in the words of one participant, "has really never taken place before in this country." The lesson from the Santo Domingo roundtable is clearly that the very process of conducting an ESAF opens the door to capacity-building events that in and of themselves contribute to the possibility of policy- relevant ideas and actions. Convening such an event also enhances FESS's credibility and capacity to effectively disseminate its ESAF findings.

The indispensability of local knowledge and language capacity (two team members spoke Spanish) was also reconfirmed in the pilot case study. One of the FESS team members, a sociologist and expert on immigration, had written his Ph.D. dissertation on the Dominican Republic many years before and knew both the country and many prominent scholars and officials well. Dr. José Oviedo, a well-known Dominican academic specializing in governance and public administration, also provided valuable background information and advice during the field study. The point, however, is broader than just the need for firsthand knowledge or better access to interviewees, as necessary and important as those things are. The participation in the field study by people who are well known in the country enhances the credibility of the entire FESS team, lowering at the same time the potential for suspicions or mistrust about the intentions of the study itself.

Originally, the FESS team was to travel to the Dominican Republic twice. However, two additional trips were made (the second by only two team members) as a result of the disruption caused by Hurricane Jeanne and an unanticipated opportunity arranged by the president's office to meet with both the head of civil defense and the new environment minister, with whom the team was able to speak for over two hours. These repeat trips did allow a refinement and deepening of the research, including that gained by extremely valuable visits to important regions outside of the capital. Obviously, practical considerations of time and cost enter in to any such calculations, but where those barriers are relatively low there are benefits to be gained by both greater familiarity with the country and brief periods to reflect upon the preliminary conclusions and unresolved questions of the ESAF in progress.

A final note can be added in relation to the question of the appropriate size of the FESS field study team. While there are always new contributions made by each additional team member, the practical aspects of conducting the research, including logistics and the demands made on interviewees, call for a prudent approach. The Dominican Republic pilot case study was conducted for the most part with a four-person team. However, the judgment of the team members from this experience is that in the future a three-person team is the most efficient team size, with the caveat that all three have previous experience in conducting an ESAF study.

APPENDIX II: ESAF NARRATIVE OUTLINE

Foundation for Environmental Security & Sustainability

Environmental Security Assessment Framework

PHASE I: Country Profile

OBJECTIVES

Generate an initial overview of the country to provide background and context for the assessment.

Develop a preliminary assessment of potential political, economic, and social cleavages that may contribute to instability and/or insecurity.

Begin developing an assessment team briefing book to serve as a basis for further research and analysis.

METHOD

Conduct preliminary research through data collection and literature reviews.

TASKS

a. Draft preliminary country profile, surveying the following areas:
   i. History
   ii. Polity (including World Bank governance indicators)
   iii. Economy
   iv. Society
   v. International/Regional Context
b. Compile an overview of U.S. and international aid (technical and material) by organization/agency.

PRODUCTS

(1) Briefing book containing the following:
Preliminary country profile
Matrix of international aid

For the purposes of its work, FESS uses the following definitions as a guide:

Environmental security is a condition whereby a nation and/or region, through sound governance, capable management, and sustainable utilization of its natural resources and environment, takes effective steps toward creating social, economic, and political stability and ensuring the common welfare of its population.

Environmental insecurity is a condition whereby a nation and/or region fails to effectively govern, manage, and utilize its natural resources and environment, causing social, economic, and/or political instability that leads over time to heightened tensions, social turmoil, or conflict.

PHASE II: Identify Critical Country Concerns

OBJECTIVES

Identify *Critical Country Concerns*[*] (CCCs) to focus the scope of the assessment.

Critical Country Concerns: Underlying issues, sectors, and/or resources that may be directly or indirectly integral to stability, based on their value and significance to the economy and social well-being.

Understand the linkages among economic, social, and environmental factors. This phase addresses: What underlying issues, sectors, and resources are critical to stability? How are they critical? Who is affected when these are threatened? What are the potential consequences?

METHOD

1. DATA COLLECTION: Complete *environmental sustainability*, *econo-environmental*, and *socio-environmental* baseline data worksheets, by collecting baseline and trend data through data compilation, literature reviews, and interviews.

2. ANALYSIS: Perform environmental, econo-environmental, and socio-environmental analyses to determine key aspects integral to economic and social stability. In conjunction with literature reviews and interviews, these analyses will result in the identification of CCCs.

Environmental Sustainability: A condition in which a nation and/or region, through effective governance, accountable management, and sustainable utilization of its natural resources and environment meets the needs of the present generation without compromising the ability of future generations to meet their own needs. Environmental sustainability does not imply absolute limits. It includes those limitations imposed by the present state of technology and social organization on natural resources and the ability of the environment to absorb the effects of human activity.

Econo-environmental Analysis: An evaluation of economic activities that are dependent on the natural resource base of a country, such as agriculture and its use of land and water, extraction and refinement of minerals and fuels, exports of raw materials and other environmentally derived goods, power generation, production of finished commodities, and the use of the natural environment for subsistence living.

Socio-environmental Analysis: An evaluation of a population's sustained and secure access to the necessary requirements for life. These factors are encompassed within livelihood security, food security, health, and education.

TASKS

a. Complete environmental sustainability data baseline (e.g., land, energy, water).
b. Complete econo-environmental data baseline (e.g., PPP per capita, sectors, trade, labor).
c. Complete socio-environmental data baseline (e.g., food security, livelihoods, health).
d. Draft environmental sustainability analysis.
e. Draft econo-environmental analysis.
f. Draft socio-environmental analysis.
g. Identify critical country concerns and associated contributing factors and environmental linkages.

[*] For the purposes of this exercise, FESS has defined key terms in highlighted text boxes.

PRODUCTS

(1) Environmental sustainability baseline
(2) Socio-environmental baseline and analysis
(3) Econo-environmental baseline and analysis
(4) CCC analysis

PHASE III: Identify Environmental Security Factors

OBJECTIVES

Further refine and focus the assessment by examining each Critical Country Concern to identify *Environmental Security Factors* (ESF) – those environmental problems and issues that pose a concern for stability or contribute to the creation of one.

Environmental Security Factor: An environmental problem that has significant implications for economic and social stability and welfare, which may pose a threat to security or contribute to the creation of one.

Identify potential intervention points and preventive strategies.

METHOD

1. Determine the CCCs' relative condition and degree of vulnerability, and identify contributing factors affecting each CCC.

2. Break down each contributing factor by performing a *VSTM (Vulnerabilities/Stressors/Threats/Mitigators) analysis*. This will identify and disaggregate contributing factors and underlying issues associated with key problems to understand their scope and better target intervention points and strategies.

3. Assess security implications of the contributing factors to determine if the CCC qualifies as an Environmental Security Factor.

4. Identify potential intervention points.

VSTM ANALYSIS: Chart key problems affecting the CCC by examining each contributing factor and determining its nature and origin. For the purposes of this exercise, a ***vulnerability*** is a condition inherent to the problem and not likely to be mitigated in the short- to medium-term by external actions (e.g., geographic location, average precipitation, economic dependence on natural resource base). A ***stressor*** is an existing condition that causes stress or pressure (e.g., harmful agricultural practices, high unemployment, poor governance). A ***threat*** is a potential event or shock that may occur in the future (e.g., natural hazard, economic collapse, labor strike). A ***mitigator*** is a condition or event that alleviates the negative impact of these factors to some degree (e.g., economic or government programs to address an issue, improved technologies, migration). Each component will be placed in a column that best describes its nature (Economic, Technological, Governance, Natural, Social, or others to be determined).

CONTRIBUTING FACTOR:						
VSTM	**ECONOMY**	**TECHNOLOGY**	**GOVERNANCE**	**NATURAL**	**SOCIAL**	**OTHER**
VULNERABILITIES (inherent/existing)						
STRESSORS (existing)						
THREATS (potential)						
MITIGATORS (existing & potential)						

TASKS

a. Identify contributing factors related to CCCs.
b. Perform VSTM analyses.
c. Assess security implications of contributing factors to identify which CCCs are ESFs.
d. Profile problems and ESFs according to issues, primary causes, impacts/security implications, and affected stakeholders.

PRODUCTS

(1) VSTM analysis charts
(2) ESF profile

PHASE IV: Environmental Governance Analysis

OBJECTIVE

Assess environmental governance to examine its impact on ESFs in the context of natural resource management.

Environmental Governance: The traditions and institutions by which power, responsibility, and authority over a nation's natural resources are exercised.

METHOD

Assess the strength and effectiveness of environmental governance through an examination of:

- Existing legal and regulatory frameworks
- Socio-cultural and political legitimacy
- Capacity and integrity of environmental agencies and institutions
- Level of participation, public access, and decentralization
- Disaster preparedness and response capacity/mechanisms

TASKS

a. Conduct data collection and literature reviews
b. Compile interview lists
c. Draft targeted question sets
d. Interview authorities, private sector, and civil society groups
e. Incorporate findings into analysis as necessary
f. Assess performance of environmental governance

PRODUCTS

(1) Analysis of environmental governance
(2) Refined analyses

PHASE V: Field Test Hypotheses & Generate Scenarios

OBJECTIVE

Establish the relative significance of each Environmental Security Factor by developing potential crisis scenarios and possible outcomes

METHOD

Test preliminary findings and hypotheses through field research

Two general typologies of scenarios will be developed. One will project likely outcomes if trends (vulnerabilities, stressors, and mitigators) remain constant; the second will posit shocks to the system and project likely outcomes given the present capacity to respond. Each scenario will be evaluated in terms of probability and potential impact.

TASKS

a. Conduct in-country interviews
b. Test preliminary hypotheses
c. Formulate preliminary scenarios

In consultation with the USAID mission, FESS will design and facilitate a *scenario development exercise*, when feasible, for U.S. government field staffs, implementers, and in-country counterparts to tap in-country experience and expertise to develop and test scenarios. The exercise would seek to provide benefits for all participants, including creating a participatory forum for expanding dialogue and opportunities to leverage available resources.

PRODUCTS

(1) 2-page scenario reports

PHASE VI: Review of U.S. Assistance

OBJECTIVE

Identify gaps and target areas to improve U.S. coordination and/or assistance

METHOD

In the context of international assistance and local initiatives, review U.S. assistance strategies across agencies and assess their role and value in addressing environmental security problems.

TASKS

a. Review international aid matrix and local initiatives.
b. Compare U.S. assistance against potential scenarios and assess results.

PRODUCTS

(1) Evaluation of U.S. assistance with preliminary recommendations for improved coordination and/or targeted assistance.

PHASE VII: Response Options & Recommendations

OBJECTIVE

Review and evaluate appropriate responses to the principal environmental security problems and propose alternate remedial actions.

Provide a comprehensive assessment and recommended actions to present options for policymakers and stakeholders to make informed decisions on environmental and resource problems.

METHOD

Consolidate ESAF findings and draft final report.

Develop recommendations that consider policy options, entertaining the full range of actions available to policymakers and stakeholders.

TASKS

a. Develop recommendations and draft final report
b. Draft action memoranda and identify possible distribution formats and channels

PRODUCTS

(1) Final report with annexes
(2) 1-2 page action memoranda

APPENDIX III: PERSONS CONSULTED FOR THIS STUDY

Government Officials from the Dominican Republic

Leonel Fernández Reyna
President of the Dominican Republic

Max Puig
Minister
Ministry of Environment and Natural Resources (SEMARN)

Carlos Doré Cabral
Director of the Office of Analysis and Strategy for the Presidency

Frank Moya Pons
Minister
SEMARN (Mejía administration)

Hugo Guiliani Cury
Ambassador to the U.S.
(Mejía administration)

Flavio Darío Espinal
Ambassador to U.S.
(Fernández administration)

Olga Luciano
Director of Planning
Ministry of Environment and Natural Resources (SEMARN)

Patria Sánchez
Assistant to the Director of Planning
SEMARN

René Ledesma, Ph.D.
Vice Minister for Environmental Management
SEMARN

Miguel Silva
SEMARN

Rafael Brito
Sub-Secretariat for Soil and Water
SEMARN

Doroteo Rodríguez
Manager of Alternative Sources and Efficient Use of Energy
National Energy Commission (CNE)

Cosme B. Bidó
Inter-Institutional Technical Group, UN Convention on Combating Desertification
SEMARN

Paíno Abreu
(Former Designated Minister of the Environment and Natural Resources)

Omar Ramírez
Councilman, National District
PLD Environmental Transition Team

Indhira De Jesús
Engineer, Ministry of the Environment and Natural Resources
Dean of Engineering, Instituto Tecnológico de Santo Domingo (INTEC University)

Minou Tavárez Mirabal
PLD Deputy
National Congress

Lic. Ydalia Acevedo Monegro
Subsecretaría de Estado de Recursos Costeros y Marinos
SEMARN

Licda. Martha Pérez
Subsecretaria de Educacíon y Información Ambiental
SEMARN

Coronel, E.N. (DEM) Valério García Reyes
Chief of the National Environmental Police

Josefina Gómez
Directora de Evaluación Ambiental
SEMARN

Vásquez Tineo
Head of the Department for Environmental Protection
SEMARN

Ellen Bradley
Centro Inversión y Exportación (CIE)

Octavio López
Director General of Mining

Rosa Urania Abreu
Technical Assessor of the Director General
Corporacion del Acueducto y Alcantarillado de Santo Domingo

Joaquín Gerónimo
Director
National Council for Urban Affairs (CONAU)

Edgar Reyes
CONAU

Gen. Luis Luna Paulino (ret.)
Director of Civil Defense
National Emergency Commission

Luis Simó
Sub-Secretary of International Relations
Ministry of Tourism

Yolanda de Leon
Subsecretaria Gestion Ambiental, Direccion Evaluaciones Ambientales,
SEMARN

Jaime Lockward
Direccion de Proteccion Ambiental
SEMARN

Lourdes Meyreles
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Government Officials from the United States

David Delgado
Deputy Mission Director
United States Agency for International Development

Odalís Pérez
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United States Agency for International Development

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U.S. Embassy

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Latin America Division, Caribbean Basin Branch
Department of Defense

NGOs/Multilateral Organizations

Pierre Werbrouck
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World Bank

Alfredo Morillo
Sustainable Management of Natural Resources
Helvetas

Andrés Ferrer Benzo
Director
The Nature Conservancy

Nestor Sánchez
Director of Conservation Programs
The Nature Conservancy

Christine Herridge
Coordinator
Dominican Association of Disaster Mitigation

Juan José Espinal
Specialist in Trade and Agribusiness Development
Inter-American Institute of Cooperation for Agriculture (IICA)

Stephanie Campbell
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Alliance to Save Energy
(Based in Washington, DC)

Rosa Rita Alvarez
President, Alliance of NGOs
Executive Director, Women in Dominican Development

Addys Then Marte
Executive Director
Alliance of NGOs

Umberto Checo
National Forestry Council

Isidro Gómez
ADELDA

Luis Fragoso
Area Coordinator
World Vision

Jose Aníbal de la Rosa and Cayetano Franco
Confederación Agricola – Unión Campesina Autónoma

Arcadio Sosa
Centro Puente

Horacio Ornes
Executive Director
Foundation for Community Development (FUDECO)

Marsie González
FUDECO

José Ramón Acosta
Executive Director
ProNatura

César Vargas Pimental
Executive Director
Instituto de Derecho Ambiental de la República Dominicana

Cesáreo Guillermo
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Daniel O'Neil
PADF

Joseph Félix
PADF

Bill Kaschak
International Resources Group (IRG)

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Servio Tulio Castaños Guzmán
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Fundación Institucionalidad y Justicia (FINJUS)

Carlos Villaverde Gómez
Project Director
FINJUS

Henry Hernández
Environmental Health Assessor
Pan American Health Organization

Frederic Emán-Zade
Director
Global Foundation for Democracy and Development

Jaime Moreno
Global Foundation for Democracy and Development

James Morrell
Executive Director
Haiti Democracy Project
(Based in Washington, DC)

Mr. Manuel Serrano, Executive Director
Quisqueya Verde

Pilar Ramirez
Instituto Interamericano de Cooperacion para la Agricultura

Academics/Think Tanks

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Annette Tejada
Director, Center for Urban and Regional Studies
PUCMM

Haroldo Dilla
Facultad Latinoamericana de Ciencias Sociales
(FLACSO)

Dr. Jaime Aristy-Escuder
Fundacion Economía y Desarrollo

Associations/Private Sector

Paola Dimitri
Director of Santo Domingo Hotel Association

Lisette Gill
Executive Director
Asociación Hoteles La Romana Bayahibe

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