

Financing Biodiversity Conservation

Ricardo Bayon
J. Steven Lovink
Wouter J. Veening

Inter-American Development Bank

Washington, D. C.

**Sustainable Development Department
Technical Papers Series**

**Cataloging-in-Publication provided by
Inter-American Development Bank
Felipe Herrera Library**

Ricardo Bayon.

Financing biodiversity conservation / Ricardo Bayon, J. Steven Lovink, Wouter J. Veening.

p. cm. (Sustainable Development Dept. Technical papers series ; ENV-134)
Includes bibliographical references.

1. Biological diversity conservation--Finance. 2. Biological diversity conservation--Economic aspects. 3. Sustainable development. I. Bayon, Ricardo. II. Lovink, J. Steven. III. Veening, Wouter J. IV. Inter-American Development Bank. Sustainable Development Dept. Environment Division. V. Title. VI. Series.

639.9 B286--dc21

Wouter Veening is Policy Director with The Netherlands Committee for IUCN, an environmental NGO. Steven Lovink is President of TransGlobal Ventures, Inc., a private corporate finance and venture development company based in Washington, D.C. Ricardo Bayon, an independent consultant, was affiliated with IUCN at the time of this writing. The authors would like to acknowledge Lorenzo Rosenzweig of AMBIO Consultores (Mexico) and Pedro Filho Leitao of FUNBIO (Brazil) for their active support. They are also grateful for the valuable written comments received from James Bass, Michael Collins, Marc Dourojeanni, Alison Schultz, Berthold Seibert, Kim Staking, Raul Tuazon, Deborah Vorhies and Sven Wunder. This report also benefited from discussions on an earlier draft that took place during a seminar held for that purpose. Special mention should also be made of the in-kind support and contributions of IUCN-The World Conservation Union.

This report is part of a consultancy financed by The Netherlands Environmental Technical Cooperation Trust Fund, which is managed by the IDB. The project team responsible for the work consisted of Kari Keipi and Gil Nolet of the Sustainable Development Department and Shigeo Sakai Environment and Natural Resources Division, Region 2. The opinions expressed herein are the responsibility of the authors and do not necessarily reflect the official position of the Inter-American Development Bank.

June 2000

This publication (Reference No. ENV-134) can be obtained from:

Environment Division, Publications
Mail Stop W-0500, Inter-American Development Bank
1300 New York Avenue, N.W.
Washington, D.C. 20577

E-mail: mariak@iadb.org
Fax: 202-623-1786
Web Site: <http://www.iadb.org/sds/env>

Foreword

The Latin American and Caribbean region is rich in biodiversity. It is home to over a quarter of the world's known mammal species, one third of reptile species and flowering plants and close to half of known bird and amphibian species. Biodiversity has not only intrinsic, scenic, social and cultural values, but also economic value through its contribution to medicine, agriculture, fisheries and forestry products and the many other services it provides. How to capitalize upon these development opportunities to conserve biodiversity remains an enormous challenge.

This need was first discussed at a workshop on investing in biodiversity conservation, held at the Inter-American Development Bank in October 1996. At this workshop, it was suggested that the Bank continue, among other things, to explore and assess financing mechanisms for the conservation and sustainable use of biodiversity.

The current document provides a framework for analyzing existing and evolving financing mechanisms. It shows how these instruments can be used to channel both public and private resources to help conserve what has been mistakenly considered, until recently, a free good. It also presents preliminary suggestions to the Bank for developing a strategic framework for addressing biodiversity conservation issues in the region.

Walter Arensberg
Chief, Environment Division
Sustainable Development Department

Abstract

Financing the conservation and sustainable use of biodiversity has been called one of the greatest challenges. At the heart of this challenge lies the low financial and political value which is often assigned to biodiversity and the resulting lack of financial mechanisms for conservation and sustainable use. The biological diversity of Latin America and the Caribbean is among the world's richest. This provides the region with a unique "comparative advantage", including potential business opportunities based on the sustainable use of biodiversity.

This report provides an overview of existing and experimental financing mechanisms that can be used to encourage the conservation and sustainable use of biodiversity. To help to better understand these mechanisms, it proposes a taxonomy that divides the mechanisms into three categories: (i) those that protect biodiversity as a public good, (ii) those that require correcting so-called "negative externalities" that hamper biodiversity conservation, and (iii) those that can be used to support biodiversity-based businesses.

The document ends with recommendations on how the Bank can support financing mechanisms that promote the conservation of biodiversity and its sustainable use.

Contents

Why is Biodiversity Important?	1
Biodiversity as a Global Service	
Financing Biodiversity and International Agreements	
Biodiversity as a Comparative Advantage	
A Taxonomy of Available Tools	
Biodiversity as a Public Good	6
Global Taxation Schemes	
Grant Programs	
Multilateral Assistance for Biodiversity	
Debt-Related Mechanisms	
Correcting Negative Externalities	13
Removing Harmful Subsidies and Tax Reform	
Pollution Fines, Tradable Permits and Deposit Refund Schemes	
Charging for Nature's Goods and Services	
Clean Development Mechanism and Carbon Sequestration	
Biodiversity as Business	20
Overview	
Loans	
Venture Capital	
Guarantees	
Securitization	
Capacity Building for Biodiversity Businesses	
A Way Forward	29
Mandate of the Inter-American Development Bank	
Developing a Strategic Framework	
Bibliography	32

Chapter I

Why is Biodiversity Important?

“Earth’s plants, animals and microorganisms –interacting with one another and with the physical environment in ecosystems– form the foundation of sustainable development.”

“Global Biodiversity Strategy” (WRI, IUCN, UNEP, 1992)

Biodiversity as a Global Service

In 1992, the governments of most of the world’s countries signed the UN Convention on Biological Diversity in Rio de Janeiro. Barely eighteen months later, the convention had been ratified by dozens of countries and it entered into force.¹

eat, the water we drink, the medicines we take and the materials we use for shelter. There is also a demonstrated link between biodiversity conservation and poverty. Often, the destruction of biodiversity increases the net poverty of rural and indigenous communities, the majority of which depend on biodiversity as a source of food and traditional medicines (FAO, 1997).

Box 1

What is Biodiversity?

The UN Convention on Biological Diversity defined biodiversity as “the variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems.” This borrows heavily from the “Global Biodiversity Strategy” (WRI, IUCN, UNEP, 1992) which defines it as “the totality of genes, species, and ecosystems in a region” and divides this into three hierarchical categories: genetic diversity within species, species diversity (the variety of species within a region), and ecosystem diversity. It also notes that when looking at biodiversity, it is important to examine not only “compositional diversity” but also diversity in ecosystem structure and function. They also note that human cultural diversity could be considered part of biodiversity since, like other aspects of biodiversity, it “helps people adapt to changing conditions”.

Source: The Nature and Value of Biodiversity in Global Biodiversity Strategy (WRI, IUCN, UNEP, 1992)

The speed with which the Convention was ratified (faster than most other UN Conventions) reflects an awareness of the importance of biological diversity to humankind. Biodiversity supports all life on Earth and is indispensable for human survival. The services and products that we derive from ecosystems are many. They include the food we

Recently, a group of economists and biologists (Costanza et al., 1997) estimated that humans derive somewhere between \$16 and \$54 trillion per year from these ecosystem services. This comes to an annual average of \$33 trillion, compared to total world GDP of \$29 trillion in 1996 (World Bank, 1998c).

¹ As of January 1999, 175 countries had ratified the CBD, including 33 from Latin American and the Caribbean. Of particular note is the fact that the United States has not yet ratified the Convention.

Despite its importance, much of this natural wealth on which we depend is under threat. Estimates of the rate of species and habitat loss vary, but a re-

cent Red List of Threatened Animals of the International Union for the Conservation of Nature (IUCN, 1996) found that as many as 25 percent of the world's mammal species are threatened with extinction. Threatened freshwater fish, amphibians, reptiles and birds amount to 34 percent, 25 percent, 20 percent and 11 percent, respectively. Although less is known about the status of the world's plants, the recent IUCN Red List of Threatened Plants (IUCN, 1997) found that more than 33,000 species of vascular plants may face extinction. This is approximately 12.5 percent of the world's estimated 270,000 species of these plants.

This has implications for all aspects of human endeavor, from agriculture to medicine to industry, all of which depend on biological diversity. Much of the reason for this threat to global biodiversity rests in the "public goods" character of the goods and services it provides. In practice, this means that it is difficult to get people to pay for those goods and services. Public goods such as clean water and air are considered "free" and, as a result, tend to be taken for granted and overexploited until they either become scarce or cease to exist. The benefits they provide are "externalities", factors for which there is no market and which are not taken into account in market calculations.

An analogy can be drawn to the goods and services provided by a private company. If nature were a corporation, intent on recouping its costs and making a profit, we would be forced to pay for all of the goods and services it provides. In addition, if these goods had been patented, we might even find ourselves paying a royalty or license fee every time we use these original products. In theory, if people and organizations were to pay an annual "royalty" into a biodiversity trust fund, some of the costs of conserving nature could be covered.

Financing or paying for the conservation of biodiversity remains one of the most challenging and elusive endeavors facing us today. And beyond finding new resources for biodiversity conservation, we also need to find better ways of using existing resources more efficiently (Panayotou, 1997) since it is not always clear that more money can actually solve the problem. It is a challenge that demands energy, innovation and creativity. At

its heart lies the lack of recognition of biodiversity's importance and economic value, as well as nonexistent (or ill-defined) mechanisms for internalizing these values into the market system. In addition, there are multiple institutional and enforcement failures as well as perverse or conflicting policies and incentives that encourage the destruction of biodiversity. At a very basic level, the challenge also revolves around who pays for what and why.

Financing Biodiversity and International Agreements

Several international agreements, ranging from Agenda 21 and the Convention on Biological Diversity, to the declaration of the Summit of the Americas meeting in Bolivia, can help the nations of the region to translate their concern about the fate of their biodiversity into a system of sustainable financing.

The 1992 Convention on Biological Diversity (CBD) is the principal organizing framework for the international community with respect to biodiversity issues. Its three main objectives (Glowka et al., 1994) are listed below.

- (i) Conservation of biological diversity.
- (ii) Sustainable use of biodiversity components.
- (iii) Fair and equitable sharing of benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources, including to technologies, and by appropriate funding (UNEP, 1992).

Pursuant to Articles 21 and 39 of the CBD, the Global Environment Facility (GEF) was designated as the (interim) financial mechanism for implementation of the CBD. The GEF, however, can only fund "enabling activities" (i.e. the activities that prepare a country for its obligations under the CBD) and "incremental costs" (i.e. those extra costs needed to ensure a global environmental

benefit on top of local and national benefits).² This means that there is no established funding mechanism to finance the purely “national benefits” of conserving biological diversity and that sources of finance for these activities will need to be found at the local and national levels. Naturally, the GEF is expected to play a catalytic role in this regard, but much remains to be done.

In addition, Articles 20 and 21 of the CBD on financial resources envision a broader approach to the mobilization of new and additional financing. Specifically, Article 21(4) states that the parties to the CBD “shall consider strengthening existing financial institutions to provide financial resources for the conservation and sustainable use of biological diversity”. More recently, the Conference of the Parties to the CBD urged that activities of bilateral, multilateral, regional and nongovernmental funding institutions be supportive of the CBD, especially through collaboration among these institutions, the encouragement of private sector involvement in support of the CBD and the adoption and publication by developed countries and other funding institutions of standardized financial information on support of the CBD’s objectives.³

Similar statements have been included in the Bolivia Plan of Action (OAS, 1998) where the countries agreed on the “urgent need to explore the development of financial instruments and funding mechanisms, in particular with regard to the Convention on Biological Diversity” (1996 Summit of Santa Cruz de la Sierra).

² At COP-4 the GEF has been requested to make the calculation of incremental costs more transparent and easy to understand. See: *Review of the Effectiveness of the Financial Mechanism*, Decision IV/11 adopted by the Fourth Meeting of the Conference of the Parties, Bratislava, Slovakia, May 4-15, 1998.

³ See also: Decisions IV/12, *Additional Financial Resources*, and IV/13, *Additional Guidance to the Financial Mechanism*, adopted by the Fourth Meeting of the Conference of the Parties, Bratislava, Slovakia, May 4-15, 1998.

Biodiversity as a Comparative Advantage

Although it is important to live up to international commitments there is a more fundamental and self-serving reason why the countries of Latin America and the Caribbean should be interested in the conservation of biological diversity. These countries are among the world’s richest in biodiversity, which gives them a comparative advantage that could be harnessed to stimulate the region’s economic growth and development.

The region’s rich biodiversity is well documented. With only 16 percent of the global land surface and 8 percent of its human population, Latin America is home to 27 percent of the world’s known mammal species, 37 percent of known reptile species, 43 percent of known bird species, 47 percent of known amphibians and 34 percent of known flowering plants (IUCN, 1996, 1997). In addition, it has around 700 million hectares of potentially arable land, some 570 million hectares of natural grassland, more than 800 million hectares of forests and vast amounts of available surface freshwater (almost 27 percent of the world total). Unfortunately, instead of being used to the advantage of the people of the region, this wealth is being squandered. For example:

- (i) Brazil, Colombia, Peru, Ecuador and Mexico are among the countries with the world’s highest number of threatened mammals, birds, reptiles and amphibians (IUCN, 1996).
- (ii) Deforestation rates in Central America are higher than anywhere else in the world (FAO, 1997).
- (iii) Although they received considerably less media attention, forest fires in the Amazon during 1997 and 1998 were more widespread than in Indonesia (Nepstadt et al., 1999).
- (iv) A surge in mining activity, together with large-scale agriculture and infrastructure projects, threatens many of the region’s most delicate ecosystems (Conservation International, 1998).

All is not lost. Although the problems of biodiversity loss are grave, resolving them might allow the region to tap into a potential development oppor-

tunity. Many people believe that in the near future, biological wealth will underpin a wide range of businesses and industries. Indeed, biological wealth already translates into economic wealth in several ways. For instance, globally, nature tourism generates an estimated \$12 billion annually (WRI, IUCN, and UNEP, 1992), although it is not known how much of this is environmentally benign. In the pharmaceutical industry, compounds extracted from plants, animals and microbes were involved in the development of the twenty top selling drugs in the United States, drugs whose combined sales approached \$6 billion in 1988 (WRI, IUCN and UNEP, 1992). In agriculture, organic products, produced using clean technologies and often with native plants, have important direct and indirect biodiversity effects. Sales of organic products have increased markedly, reaching an estimated \$3.3 billion in 1996. Crop diversity will be used in the future for breeding new strains and subspecies in order to improve harvests and pest resistance.

Based on the above, it can be argued that food supply, food security and the remedies for existing and emerging diseases (of both humans and crops) could eventually depend on much of the biodiversity found in the countries of the region (WRI, et al., 1998).

A Taxonomy of Available Tools

To realize the full development potential of its resource endowment, the countries of Latin America must invest in the conservation and sustainable use of its biological diversity. What mechanisms exist to facilitate this kind of investment? How can public and private money be channeled to help finance what has been, until now, a free good? This report will not attempt to fully answer these questions, but aims at providing an overview of some tools and options for financing biodiversity conservation and promoting its sustainable use, including case studies and actual examples related to the tools listed in this chapter.

In light of declining development assistance and structural debt problems, more needs to be invested domestically and internationally in biodiversity conservation and its sustainable use than is

currently the case. But where might that investment come from? To better answer this question, it can be useful to create a taxonomy of financing instruments that can be used to promote the conservation and sustainable use of biodiversity.

A number of authors (Panayotou, 1994a; McNeely, 1997; Pearce, 1997; Asad, 1997; UNDP, in press; US-EPA, 1997; among others) have proposed taxonomies of existing, as well as new and innovative, mechanisms for financing sustainable development. McNeely (1997), for example, has proposed a taxonomy that looks at financing mechanisms in terms of where (institutionally) they originate and divides them into four groups: (i) tools that can be initiated through international cooperation, (ii) tools that governments can initiate, (iii) tools the private sector can initiate and (iv) tools NGOs can initiate. In a different approach, Pearce et al. (1997) focussed only on mechanisms for *national* innovative finance and divided them into three types: (i) cost-reducing mechanisms, (ii) externality-correcting mechanisms and (iii) mechanisms financed from national savings. The authors of a recent UNDP (in press) report on financing for sustainable forestry have taken a different approach. They divide financing mechanisms into the “conventional” and the “innovative”. Under conventional mechanisms they include grants from bilateral and multilateral organizations and NGOs, as well as certain forms of private finance for forestry. Under innovative finance they include a number of mechanisms divided into four groups: (i) direct commercial financing mechanisms, (ii) direct concessionary financing mechanisms, (iii) market development mechanisms and (iv) structural mechanisms. Asad (1997) analyzed the options in terms of their effect on the public or private sector.

Borrowing heavily from the typologies described above, Bayon (forthcoming) proposes a division of the financing mechanisms based on the types of funds used, as well as their impact on the market. He proposes that we divide the mechanisms into three groups: (i) those aimed at safeguarding biodiversity as a public good, (ii) those aimed at correcting negative externalities and (iii) those aimed at stimulating businesses that protect biodiversity and/or use it sustainably.

Table 1 Toward a Taxonomy of Tools for Financing Conservation (modified from Bayon, forthcoming)		
As Public Good	Correcting Negative Externalities	As Business
<ul style="list-style-type: none"> • Taxation (National and International) • Grants and Subsidies • Loans from MDBs • Debt-related Instruments 	<ul style="list-style-type: none"> • Reforming the Tax System • Removing Damaging Subsidies • Environmental Fines • Tradable Permits and Extraction Quotas • Deposit-Refund Schemes • User Fees/Charges • Joint Implementation and Carbon Sequestration 	<ul style="list-style-type: none"> • Credits and Loans to “Green Businesses” (including Export Credits). • Venture Capital (equity or quasi-equity) for “Green Businesses” • Guarantees for “Green Businesses” • Securitization

Biodiversity is a public good, that is, most of its benefits are available to society in general. While there are ways of using market mechanisms to pay for the conservation of biodiversity, most aspects of biodiversity will always be difficult to “market”. Society will ultimately have to foot the bill for some of these services (e.g. clean air, nutrient recycling and pollination). This will mean the allocation (or reallocation) of public resources and increased efforts to correct existing negative externalities.

In some cases the interests of business can coincide with the conservation of biodiversity, provided the appropriate regulatory framework is in place. Ecotourism is a good example of an industry whose profitability relies on scenic beauty and the conservation of nature. Its relationship to biodiversity is clear: if the natural values of the areas in which an ecotourism company operates are destroyed, it loses its ability to make money. Therefore, a shrewd ecotourism operator will invest in conserving biodiversity on the understanding that it will eventually be good for business. It is important to note, however, that Southgate (1997) has argued that the linkages between eco-

tourism (or, for that matter, biodiversity-based businesses in general) and biodiversity are not all that clear. He concludes that businesses that are based on biological diversity should not serve as the centerpiece for strategies to protect it. More could be accomplished by raising crop and livestock yields so that clearing land for agriculture is no longer needed.

These criticisms notwithstanding, a case can be made that there is a kind of synergy between some businesses and biodiversity conservation and that, as a result, investment in these businesses helps stimulate the conservation and sustainable use of biodiversity. In addition to ecotourism, some businesses whose profitability is closely tied to biodiversity conservation include nontimber forest products (NTFPs), bioprospecting, organic agriculture and the development of alternative and nonpolluting sources of energy.

The chapters that follow provide a description of the financial tools and mechanisms and case study examples of how these tools and taxonomy have been applied.

Chapter II

Biodiversity as a Public Good

Global Taxation Schemes

Setting up global taxation schemes is extremely difficult, partly because it implies that sovereign nations agree to transfer a portion of their sovereignty to a supranational authority. At present, the political will for this does not yet exist. Assuming, however, that a global consensus could one day emerge to implement international taxation instruments, what might they look like?

Among the international taxes proposed, three are most relevant to the environment: a tax on foreign exchange transactions (also known as the Tobin tax), a tax on international air transportation and an international tax on carbon. Of these, only the carbon tax was proposed for purely environmental reasons. The Tobin tax was suggested as a tool for slowing down financial flows rather than as a revenue-generating scheme. In other words, Tobin's original suggestion was more concerned with the impact of the tax on the financial system than with the revenues it might generate. The tax on air transport was proposed for a number of reasons, including as a way of financing the alleviation of problems caused by pollution due to air travel.

Grant Programs

Currently, the most promising sources of grants for biodiversity at the national and international level are the Global Environment Facility, national environment funds and private philanthropy.

An example of a successful grant instrument for the environment is the UNDP-GEF Small Grants Program (SGP) which was launched in 1992 by UNDP. The SGP was created to focus on community-based activities addressing global environmental challenges, mostly implemented through NGOs. Through mid-1995, the \$16.3 million three-year pilot phase had led to the establishment of functioning programs in 33 countries in all ma-

ior regions of the world. It had also resulted in the provision of 500 grants of up to \$50,000 for community services, 95 percent of which were related to biodiversity and climate change. The pilot phase also contributed to the successful completion or management of objectives of some 80 percent of funded projects (UNDP, 1997).

Environmental Funds

There are now quite a few grant fund facilities managed by NGOs throughout the region, though most are not specifically targeted at biodiversity conservation and sustainable use. Exceptions to this are some of the environmental funds (EFs) or conservation trust funds (these instruments are sometimes referred to as national environment funds)⁴ that have recently been created in Latin America and the Caribbean as new ways of distributing money for environmental protection to interested sectors of society, NGOs, community groups or private businesses. EFs vary greatly in their objectives, governance structure, sources of finance and the activities they finance. In fact, differences among environmental funds depend on the needs and desires of the governments or institutions that set them up. Some EFs are capitalized through grants from multilateral institutions such as the GEF, some are financed through loans, others through debt-for-nature swaps and still others by governments using tax revenues or user charges on water.

On a national level, there are various examples of the use of environmental tax revenues. In Belize, the government has introduced a conservation tax on foreign tourists who visit Belize to enjoy the natural beauty of the country's forests, beaches and coral reefs. The proceeds from this tax (which stands at about \$3.75 per person) are channeled

⁴ Much of the information in this section is taken from Bayon and Deere (1998) and Bayon, Deere, Norris and Smith (1999).

into a conservation trust fund, the Protected Areas Conservation Trust, that finances the country's system of national parks and the conservation of Belize's natural resources.

There are three main types of EFs: strategy, parks and grant funds. *Strategy funds* are environmental funds with a mandate to support a full range of activities included in national environmental plans or strategies, for example, the National Environment Fund (FONAMA) in Bolivia. Funds that support the conservation of protected areas, either specific parks or national protected areas systems are called *park funds*. Examples of these are the Fund for Natural Areas Protected by the State (PROFONANPE) in Peru and the Jamaica National Parks Trust. Funds that make grants to others—typically nongovernmental organizations and community groups—for conservation and/or sustainable development projects are called *grant funds*. An example of a grant fund is the Fund for the Americas in Chile. Grant funds often have objectives that include strengthening civil society organizations, increasing environmental awareness or expanding understanding of environmental issues.

Few strategy funds are actually functioning and those that are, such as FONAMA in Bolivia, have created separate windows—often with their own assets and management structure—that closely resemble the other types of funds. The most common sources of funds for EFs are debt-for-nature swaps and/or multilateral institutions, especially the GEF (GEF, 1999). They have managed their money in one of three ways:

- (i) As *endowments* which invest their capital and use only income from those investments to finance activities.
- (ii) As *sinking funds* which are designed to disburse their entire principal and investment income over a fixed period of time (usually 6-15 years).
- (iii) As *revolving funds* that receive new resources on a regular basis (e.g., proceeds of special taxes, fees or levies designated to pay for conservation programs), which replenish or augment the original capital of the fund and provide a continuing source of money for specific activities.

Established EFs sometimes also receive funding to carry out specific projects. It is not unusual for a particular EF to combine these features as part of its overall financial structure. For example, PROFONANPE in Peru has an endowment, several sinking fund windows created through debt swaps and project funding. In the prevailing climate of shrinking international aid budgets, EFs have begun to actively look for more innovative sources of financing, including loans, water user fees and taxes on tourism, as well as by instituting a petrol tax (Costa Rica), a tax on airline tickets (Algeria) (Pearce et al., 1997) or by using the proceeds from the privatization of state industries (Ecuador).

EFs may be public or privately financed, but are usually independent foundations, managed by mixed boards whose members represent both the private and public sectors. In fact, experience has shown that the most successful funds tend to be those that involve both governments and NGOs in their operation.

Box 2

Mexico: The Mexican Nature Conservation Fund (FMCN)

Environmental funds often combine the features of parks funds and grant funds. Such is the case with the Mexican Nature Conservation Fund (FMCN), established as a private institution in 1994. Its mission is “to conserve the biodiversity of Mexico and ensure the sustainable use of natural resources through the promotion of strategic actions and medium- to long-term financial support”. FMCN was created following extensive consultations throughout the country and with the strong support of the president of Mexico, the NGO community and business leaders. FMCN has an eighteen-member board of directors made up of private individuals selected to represent diverse experience, professional abilities and geographic and demographic characteristics. Mexico’s Environment Secretary is an *ex officio* board member. The Fund’s standing committees on administration and finance/evaluation are chaired by board members but involve others from Mexico’s conservation community.

FMCN was initially capitalized with \$19.5 million from USAID and \$10 million contributed by the Mexican government. Investment earnings from this endowment support a competitive grants program of approximately \$2 million annually. Grants are made in response to requests for proposals; applications are reviewed by FMCN’s evaluation committee and approved by the full board. The first call for proposals in 1996 brought in more than twice as many applications from research institutions as from NGOs and community groups, which FMCN wanted to support. As a result, the second call focused on field-level activities and linkages to conservation priorities established in a national process partially funded by FMCN and led by the National Council for Knowledge and Use of Biodiversity (CONABIO). The Fund also provided support to organizations that helped NGOs and community groups prepare better proposals. When the third call for proposals was issued in 1998, it reflected a stronger linkage to national conservation priorities, FMCN’s new strategic plans and feedback from the first two cycles.

In 1997, FMCN received a \$16.5 million grant from the GEF through the World Bank to establish a Natural Protected Areas Fund (FANP). A new technical committee was created within the FMCN structure to oversee FANP operations. Since January 1998, earnings from the fund (about \$1 million per year) have supported operating costs for ten priority protected areas. The Mexican government has committed to providing an increasing share of basic management costs. FMCN worked with park managers to develop a logical framework that is used as a basis for the annual work plans.

Source: Excerpted from Bayon, Deere, Norris, and Smith (1999).

Many of the benefits of EFs are often cited in the literature. EFs have helped generate substantial financial resources that would not otherwise have been available for conservation. In Peru, for example, PROFONANPE has generated \$17 million through debt swaps, in addition to \$5 million in endowment capital provided by GEF. Several EFs have also been creative in looking for ways to convert project or other short-term financing into endowment capital.

EFs have helped devolve responsibility and decision-making about environmental priorities and programs to the local level. Some parks funds (for example in Mexico, Peru and Uganda) have successfully encouraged government agencies to consult more widely with community groups and others with a stake in protected area management. EFs have established effective, efficient and trans-

parent mechanisms for transferring resources to the field, often breaking bottlenecks that previously held back important activities (GEF, 1999).

These funds have increased the participation of civil society in environmental issues. In addition, the governance structures of many funds, which involve a mix of private and public sector representatives in the discussion of priorities and selection of activities, has helped reinforce country ownership of conservation programs. Environmental funds have helped build institutional capacity in many countries. They have helped nurture new NGOs, often by providing support to organizations that work with them to strengthen their project design and management capabilities.

Finally, some funds are having an upstream impact on broader environmental policies and defining

conservation priorities. For example, FMCN helped finance and participated in a process that resulted in the identification of priority areas for biodiversity conservation in Mexico. EFs in Bolivia and Guatemala have participated in the development of a national biodiversity strategy.

Concerns about EFs are mostly related to financial and governance issues. According to Panayotou (1997), those concerns are that EFs delay the development of capital markets, that revenues rather than need or social returns drive EF investments and that earmarking of investments to the environment or biodiversity leads to suboptimal social returns from scarce financial resources.

Private Philanthropy

The general public has a surprisingly generous willingness to pay for conserving biodiversity, provided appropriate means are available for them to exercise this choice. The usual way of expressing this support is through charitable giving, which sometimes can reach very significant levels. In the United States private contribution to wildlife and environment causes amounted to \$3.19 billion in 1993. Targeted fund-raising works because it gives a sense of ownership to individual donors. Whether the cause is the jaguar or an island, a whale or a coral reef, contributors identify with the object.

Fund-raising is expected to expand significantly, particularly in countries that continue to post healthy rate of economic growth and experience increases in television programming. Campaigns could generate funds from the urban middle class. The key to success is to have representatives of both funders and local communities involved in

the control and flow of such funds (McNeely, 1997).

Multilateral Assistance for Biodiversity

The multilateral development banks (MDB) such as the World Bank, the Inter-American Development Bank and the Asian Development Bank can provide loans and/or technical assistance grants for biodiversity conservation, mostly to governments. Most of the MDBs have separate windows for so-called "soft money" (concessionary resources) and other windows for "hard money." Often, the concessionary resources are either loans provided at below-market rates or in local currency, or grant resources.

One form of grant that is sometimes available from multilateral development banks is the technical assistance grant (also known as technical cooperation, or TC, in the case of the IDB). The Bank has used nonreimbursable TCs for biodiversity conservation to develop biodiversity conservation strategies (for instance in the Andean region); to strengthen institutions dealing with environmental issues (as with the Amazon Treaty Secretariat); to conduct inventories of biodiversity resources; to help establish biodiversity corridors; to provide technical assistance for remote sensing, GIS and other such systems and to provide technical assistance for regulatory reform related to the environment (IDB 1994, 1997b, 1998a).

With the creation of the GEF, the demand for biodiversity lending has decreased over the years. One possible exception is Brazil, where the government took out a loan of \$22 million (in local currency) from the Bank to finance the capitalization of a National Environment Fund (known by its Portuguese acronym, FNMA).

Box 3

Brazil: National Environmental Fund (FNMA)

The FNMA was established in 1989 to develop projects that promote the rational and sustainable use of natural resources, improve the quality of the environment and raise the overall quality of life of the population of Brazil. Seven priority areas for projects were specified: conservation units, research and technology development, environmental education, forestry extension, institutional strengthening, environmental control and rational use of flora and fauna.

In 1992, FNMA was supported by an IDB loan (883/SF-BR) in local currency at concessionary rates. The loan for \$22 million was disbursed between 1992 and 1998. It had an interest rate of 4 percent with an amortization of 25 years and a grace period of 5 years. By late 1997, FNMA had financed over 500 small environmental projects. A second loan was recently approved to provide an additional US\$24 million for the FNMA. Under the agreement with the Bank, strengthening civil society and increasing local participation in solving environmental problems were added to the Fund's original objectives. This is important because the use of Bank money has been focussed on small projects proposed and executed by nongovernmental organizations.

Unlike most funds in the region, the FNMA is capitalized through a loan taken out by the government of Brazil. According to the Bank, this shows Brazil's commitment to long-term investment in strengthening civil society to tackle environmental problems. The rationale behind this is that by strengthening civil society, the FNMA will help "create a demand" for environmental goods and help provide some of the public goods (e.g. clean air, clean water, access to open spaces) that markets tend to undersupply. It is expected that the loan will be paid back by using future tax revenues, by leveraging external grants and through the collection of environmental fines and penalties.

The FNMA is housed in the Ministry of the Environment (Ministerio do Meio Ambiente, Recursos Hidricos, e da Amazonia Legal) and is controlled by a board composed of 14 representatives. In 1997, nine of these representatives were from government and five from civil society. The Board meets several times a year to decide on administrative and operational procedures, as well as to select projects for final approval.

In a recently passed Environmental Crimes Law for Brazil, the FNMA is mentioned as one of the recipients of the proceeds collected under the new law. This could ensure a substantial contribution to the capital of the fund.

Source: Adapted from IDB 1997g.

Debt-Related Mechanisms

In certain cases a debt situation can be used to leverage financial resources for biodiversity conservation. This can be done by "swapping" the debt for conservation activities in one of a variety of ways. For instance, the debt can be bought at a discount on secondary markets by a third party (usually an environmental NGO) and then "swapped" with the debtor government for conservation activities or local currency. This is the kind of transaction that most people think of when they think of "debt swaps". But it is also possible for the creditor government to agree to forgive or exchange the debt (at a discount) in return for local currency to be used in conservation. This is known as a "debt buy-back" or "debt forgiveness" (Kaiser and Lambert, 1996).

Debt-related mechanisms can have a dual impact on the country concerned. On the one hand, they help alleviate the debt burden (although only marginally), which in turn permits the country to use the money it was using to service that debt for other priorities. On the other, swaps can generate money (in local currency) for conservation work on the ground.

It is estimated that since the first debt-for-nature swap in 1987, some \$1 billion has been leveraged for conservation (UNEP and TNC, 1999). Table 2 shows an admittedly incomplete detail of some of the more important debt for nature swaps in LAC between 1987 and 1996.

Table 2 Debt-For-Nature Swaps: Exchanges to Date by Country

	Date	Purchaser	Face Value of Debt	Cost to Donor	Conservation Funds
Bolivia					
	5/93	CMB	NA	NA	\$397,000
	6/92	TNC/WWF/JPM	\$11.5 M	NA	\$2.8 M
	8/87	CI	\$650,000	\$100,000	\$250,000
Brazil					
	6/92	TNC	\$2.2 M	\$746,000	\$2.2 M
Costa Rica					
	2/91	Rainforest Alliance	\$600,000	\$360,000	\$540,000
	3/90	WWF/TNC/Sweden	\$10.8 M	\$1.9 M	\$9.6 M
	4/89	Sweden	\$24.5 M	\$3.5 M	\$17.1 M
	1/89	TNC	\$5.6 M	\$784,000	\$1.7 M
	7/88	Holland	\$33 M	\$5 M	\$9.9 M
	2/88	CI/WWF	\$5.4 M	\$918,000	\$5.4 M
Dominican Republic					
	3/90	TNC/PRCT	\$582,000	\$116,000	\$582,000
Ecuador					
	6/92	Japan	NA	NA	\$1 M
	3/92	WWF/DKB	\$1 M.	NA	NA
	4/89	WWF/TNC/MBG	\$9 M	\$1.1 M	\$9 M
	12/87	WWF	\$1 M	\$354,000	\$1 M
Guatemala					
	5/92	CI/USAID	\$1.3 M	\$1.2 M	\$1.3 M
	10/91	TNC	\$100,000	\$75,000	\$90,000
Jamaica					
	10/91	TNC/USAID/PRCT	\$437,000	\$300,000	\$437,000
Mexico					
	11/96	CI	\$670,889	\$440,360	\$560,752
	7/96	CI	\$495,674	\$327,393	\$442,622
	1/96	CI	\$391,000	\$191,607	\$254,000
	12/95	CI	\$488,000	\$246,000	\$336,500
	11/94	CI	\$290,000	\$248,395	\$290,000
	06/94	CI	\$480,000	\$399,390	\$480,000
	06/94	CI	\$280,000	\$236,000	\$280,000
	6/93	CI	\$252,000	\$208,000	\$252,000
	1/92	CI/USAID	\$44,100	\$355,000	\$441,000
	8/91	CI/BA	\$250,000	NA	\$250,000
	4/91	CI/MF	\$250,000	\$183,000	\$250,000
Panama					
	3/92	TNC	NA	NA	\$30 M

Source: United Nations Environment Program (UNEP) and The Nature Conservancy (TNC), 1999.

Although swaps can be a good way of leveraging money, particularly in, but not limited to, the highly indebted poor countries of the region (Bolivia, Honduras, Guyana and Nicaragua), they aren't always the best source of finance for biodiversity conservation. The United Nations Environment Programme (UNEP) and The Nature Conservancy (TNC) (1999) argue that a debt swap is a bad idea in cases where a country's currency is unstable due to high inflation or devaluation or when there's a need for hard currency. It may also have a perceived impact on a country's ability to access international capital markets in the future.

It is interesting to note that debt swaps using third parties have been less common recently, in part because of the higher secondary market values of

developing country debt. This is in contrast with an increasing number of debt buy-backs or debt forgiveness transactions. A noteworthy example of this latter form of debt-related mechanism is the Enterprise for the Americas Initiative. It is a U.S. government provision to permit the conversion of Latin America debt owed to the United States for conservation projects and projects aimed at increasing children's welfare. It is estimated that this initiative led to the forgiveness of more than \$875 million worth of debt, while generating some \$650 million for projects in Latin America. The recently enacted Tropical Forest Conservation Act (TFCA) is a similar U.S. initiative that allows for the conversion of U.S. debt in return for tropical forest conservation (Bayon, Deere, Norris and Smith, 1999).

Chapter III

Correcting Negative Externalities

There is a need to internalize environmental externalities and reform the way the economic system addresses environmental concerns. This reform seeks not only to improve the efficiency of the market, but also to ensure that it is sending the right economic signals to all actors. This section focuses on mechanisms that correct externalities such as removing harmful subsidies, tax reform, pollution fines, tradable permits, deposit refund schemes, charging for nature's goods and services, the Clean Development Mechanism and carbon sequestration.

Removing Harmful Subsidies and Tax Reform

Removing Harmful Subsidies

Raising money to protect the environment will be of limited utility if even more money is spent through harmful subsidies that destroy it. De Moor (1997) and Panayotou (1997) have estimated that there are anywhere from \$0.5 to \$1 trillion worth of subsidies worldwide that damage the environment and distort economic activity. Of these, half are in developing countries and half in the developed world. The only difference between subsidies in developed and developing countries appears to be the sectors that are subsidized. In the OECD countries, most subsidies (approximately \$330 billion) go to agriculture and road transport (between \$85-\$200 billion). In developing countries, the most highly subsidized sectors are energy (\$150-\$200 billion) and water (\$42-\$47 billion).

While removing harmful subsidies can free substantial resources that could be used for biodiversity conservation and other sustainable development priorities, it can also be extremely difficult to implement, partly because subsidy recipients and their providers have become dependent on it (De Moor, 1997). Subsidies generally have powerful

and ardent supporters and only meek and feeble adversaries.

Tax Reform

In some cases, our current system of taxation may be subsidizing some undesirable activities, such as consumption, environmental degradation, resource depletion or pollution (McNeely, 1997). Some authors have proposed reducing conventional taxes and replacing them with "environmental taxes." They argue that, if done correctly, such a reform need not change the overall tax burden (that is, it would be revenue neutral) and would further many of the goals of biodiversity conservation and sustainable development.

The most important benefit from this sort of reform would be to change the incentives system: polluters would be forced to pay higher taxes and individuals or businesses that protect the environment would be given a slight competitive advantage. This would help further internalize the costs and benefits of environmental protection, presumably helping remove market distortions and mitigating market failures (Panayotou, 1994a).

Clearly, reform of the tax system is not something that will have very predictable results on biodiversity. Neither will the countries be able to achieve such reforms overnight. Also, the problem in many developing countries (including some in LAC) is that there is a generalized inability to collect taxes of any sort. In a situation such as this, tax reform will be of only limited benefit. Still, a number of countries have already instituted environmental taxes with varying degrees of success. Panayotou (1997) highlights that the introduction of these taxes in OECD countries has been mostly geared at raising revenue rather than changing behavior, but that the real benefit of these taxes is in the incentives they provide to the various economic actors. Examples cited in the literature include forestry taxes in Brazil, Colombia and Venezuela

(Seroa da Motta, Ruitenbeek and Huber, 1997). These taxes impose a higher burden on forestry activities that do not have adequate provisions for reforestation. Reforestation may have two beneficial impacts in biodiversity: an indirect effect in reducing the exploitation of natural forests and a direct effect when native and multiple species are used in plantation. At the same time, there has been some encouraging experience in LAC with the use of conventional taxation to achieve environmental ends (Seroa da Motta, Ruitenbeek and Huber, 1997).

In some countries, revenues from the state valued-added tax are distributed according to environmental criteria. In Colombia, a percentage of the property tax is set aside in municipalities for expenditures by regional environmental agencies. And in Costa Rica, a five-cent tax on the liter of gasoline has been used to increase reforestation, forest management, and protection.

Much of the experience to date with environmental taxation has been on the pollution and industry front, but more could be done on taxing resource extraction, such as use of water or deforestation. The other side of tax reform is the provision of incentives (i.e. tax credits) to individuals and industries that protect the environment. In LAC, most countries offer some form of tax incentives for investment in pollution abatement and clean technology. An example of how tax incentives can encourage private investment in biodiversity conservation is the creation of Green Funds in the Netherlands (see Box 7) and the Green Protocol in Brazil (Box 4).

Several Latin American countries have used tax credits to stimulate reforestation. For example, in Costa Rica the government has instituted a transferable tax credit (Panayotou, 1994b). This credit applies to landowners who keep forests on their lands or plant native species. Because the credit tends to benefit wealthy landowners with large tax burdens, the system allows small landholders who reforest or plant native species to sell their credits to those with higher tax burdens.

Pollution Fines, Tradable Permits and Deposit Refund Schemes

Three mechanisms that can generate revenue for biodiversity conservation are fines on pollution and other undesirable activities, tradable permits to pollute or tradable resource quotas and deposit refund schemes (Panayotou, 1994a, 1994b, 1997; Markandya, 1997, McNeely, 1997; Pearce et al., 1997; Seroa da Motta, Ruitenbeek and Huber, 1997).

Environmental Fines

According to Panayotou (1994a) and Lopez (1994), environmental fines have an enormous potential as sources of revenue. In LAC, examples of the use of fines to raise revenue for environmental activities include water pollution fines in Brazil and Colombia and air pollution fines in most countries of the region (Seroa da Motta, Ruitenbeek and Huber, 1997). In Brazil, the new National Environmental Law has set up a mechanism whereby the National Environmental Fund (Box 3) gets a portion of the environmental fines collected in the country. By ensuring that the revenue generated by pollution fines is used to finance projects that help conserve the environment, fines can yield a double benefit for biodiversity conservation.

Tradable Permits and Extraction Quotas

Tradable permits differ from fines in that they set an upper limit on a certain activity and use the market to achieve the environmental objective in the most efficient way possible. An example of a system of tradable permits is the one currently in place in the United States to reduce air pollution (particularly in terms of sulphur dioxide, SO₂). Under this system, polluters are given “permits to pollute.” If they go beyond the pollution levels for which they have permits, they are fined. The system allows those who underpollute to sell their excess permits to overpolluters and thus can create a strong incentive for pollution abatement. Permits (this time on resource extraction) have also been used to limit the use of water resources (in Chile) or to minimize the impact of industrial activities on fisheries (in New Zealand).

There is a consensus (Markandya, 1997; Pearce et al., 1997; Panayotou, 1997) that permit systems tend to reduce compliance costs considerably and can often be more effective at reducing pollution than more command-and-control mechanisms (though this only applies when pollution legislation is effectively enforced). Additionally, if permits are initially auctioned off to polluters, they can raise a modest amount of revenue that can be used to protect the environment. Likewise, fining overpolluters can serve as a source of income for the public sector.

Deposit Refund Schemes and Environmental Performance Bonds

Deposit refund schemes and pollution bonds are forms of liability insurance imposed on companies or individuals by the government. The more familiar form of a deposit refund scheme is the system in place in many countries whereby a small surcharge is added to every glass bottle or aluminum can sold. If and when consumers recycle the container, the surcharge (the deposit) is returned to them. However, the system can be used to mitigate

damage at a much larger scale as is the case, for instance, in systems where mining companies are forced to take out “environmental bonds” when they are awarded a concession. If the government concludes that the mineral extraction is done without major damage to the environment, the “bond” or deposit is returned to the company (Pearce et al., 1997). However, if the government’s assessment is that the mining activity has caused a certain amount of damage to the environment, the “bond” money is used to pay for fines and remediation.

These systems aim to shift responsibility for controlling pollution or environmental damage, as well as for monitoring and enforcement, to individual producers or consumers who are charged in advance for the potential damage (Panayotou, 1994b). This helps internalize the true costs of environmental degradation into the economic calculations of consumers and companies when they undertake potentially harmful resource use or extraction.

Although there is much experience in Malaysia, Australia, and the Philippines with environ-

Box 4

Brazil: The Green Protocol

On November 14, 1995, Brazilian President Fernando Henrique Cardoso signed a unique agreement called the “Green Protocol” (*Protocolo Verde*). This Agreement was designed to strengthen the environmental policies of publicly-funded development banks in Brazil and to minimize the environmental impact of loans provided by the country’s leading government-owned banks (Dourojeanni, 1997). It further assigns priority in the use of the financial resources of the federal government to those projects that have a greater likelihood of sustainability and do not cause damage to the environment. The Green Protocol is intended to eventually apply to both public and private institutions. IBAMA’s president reportedly invited over 200 private banks to join the initiative. The national banks who committed to the Green Protocol lend in excess of \$22 billion per year to industrial and agricultural projects, so its potential impact is very significant. The Protocol’s objectives incorporate several measures specifically targeted at the conservation and sustainable development of biodiversity.

The Green Protocol is not a law, but a code of conduct and a set of best practices that help signatory institutions mainstream environmental concerns into their decision-making processes. The regulation of the Green Protocol, including the creation of linkages between its criteria and existing legislation, is an important condition for more effective implementation. On balance, the Green Protocol has stimulated more widespread inclusion of environmental variables into project appraisals of financial institutions and their intermediaries. Importantly, it has also resulted in the availability of special lines of credit and a number of programs offering more attractive interest rates and/or loan conditions. Among these, the Constitutional Financing Fund for the North (FNO) operated by the Bank of the Amazon (BASA), appears to be the best example of a source of special credit for the specific area of biodiversity. FNO is funded by the imported products tax and the income tax. Such special credit is offered by BASA through PRODEX (Support Program for the Development of Nonwood Forestry Products), PRODAGRI (Support Program for the Development of Agriculture) and PROSUMAN (Support Program for Environmental Sustainability and Conservation).

Source: IBAMA and NWF, 1996.

mental bonds used to help pay for damage caused by mining or logging, the possibility of using these sorts of schemes to conserve biodiversity in LAC needs to be further explored.

Charging for Nature's Goods and Services

At present, only a small fraction of the costs for irrigation water and industrial energy is being paid by users. Panayotou (1994a) argues that full-cost pricing of the public goods and services provided by the environment is beneficial because it reduces the burden on the state budget from the deficits of public utilities which do not fully recover their costs. It also reduces the need for additional capital to expand supply systems. Full-cost pricing can result in a financial surplus that could be used to finance environmental improvements, to provide basic services to the poor at subsidized rates, or for other government priorities. Finally, full-cost

pricing sends the correct signals to the market and therefore helps conserve natural resources, thereby reducing the need for financial resources to mitigate the damage.

An example of how user fees can help raise revenue for sustainable development comes from Ecuador. In the city of Quito, the government has been working with local NGOs and The Nature Conservancy to charge a more appropriate fee for the provision of water. The revenues raised by the user fee will be used to capitalize a trust fund (Box 5) designed to finance the conservation of the watershed that provides most of the water for the city. In this way, an attempt is being made to charge a more reasonable price for one of the most important goods (fresh water) provided by forest ecosystems.

In addition to Ecuador, several other Latin American and Caribbean countries (including Colombia,

Box 5

Ecuador: The Watershed Conservation Fund (FONAG)

In late 1997 and early 1998, the government of the city of Quito, Ecuador, began working with The Nature Conservancy and other national and international entities to examine the possibility of creating a conservation fund for the watersheds that supply the city with most of its water. This fund, the *Fondo para la Conservación del Agua* (FONAG), was to be capitalized by charging the citizens of Quito a nominal water user fee. The idea is that a specialized fund can: (i) collect the money obtained by charging the user fee, (ii) raise money from other national and international sources, (iii) manage that money so that it will generate revenues (interests on investments) and (iv) use these funds to finance the conservation of two of Quito's most important watersheds, the Natural Reserves of Antisana and Cayambe-Coca.

At first, it was unclear how the water user fee would be established. To resolve this problem, the institutions involved funded a study to calculate the fee that could be charged for the use of water in Quito. This study found that the minimum fee to cover the costs of very basic management of the protected areas was about \$0.001 per cubic meter of water used in 1996. For the average family of five, with a monthly consumption of 40 cubic meters of water, this would represent a payment of \$0.04 per month.

By levying a user fee to capitalize FONAG, the government of Quito intends to differentiate between the "consumptive" and "nonconsumptive" uses of water. Consumptive uses of water include drinking water and use of the water for irrigation, while nonconsumptive uses include the generation of electricity and the use of water in recreation. The plan for FONAG is to charge a discounted rate for the nonconsumptive use of water.

The resources thus raised would be used by FONAG for watershed conservation including developing productive projects that help provide alternative sources of income for the people who live in the watersheds. FONAG's funds would be managed by a private capital management institution in order to obtain the maximum return on the capital invested. The fund would be as efficient as possible, with administration fees limited to around 10%-20%.

FONAG would give water resources an economic value and help make conservation projects financially sustainable through the ongoing generation of revenues.

Source: TNC, 1997; Echavarría, 1999.

Costa Rica and Jamaica) have begun looking at the possibility of creating water funds or imposing conservation taxes on foreign tourists. In fact, if enough countries begin allowing the use of charges and fees for the services of biodiversity, one can imagine that a market in these goods and services could be established. User fees need not be limited to water or tourism. One can envisage situations where user fees could be charged for some of the other goods and services provided by nature, such as the use of national parks, protection against erosion, the provision of nontimber forest products and storm protection, among others. On the nonbiological side, full-cost pricing of the provision of energy can have tremendous impacts on energy efficiency (Panayotou, 1994a).

Clean Development Mechanism and Carbon Sequestration

In what may actually be an application of full-cost pricing at the global scale, the signing of various international environmental conventions and discussions about flexible mechanisms for their implementation (e.g. joint implementation and the Clean Development Mechanism in the case of the Climate Change Convention) have generated new financial opportunities for biodiversity conservation.

The Climate Change Convention

While many human activities (like generating electricity and driving cars) and many natural processes (like respiration) produce carbon dioxide, there are also natural processes (like photosynthesis) that use carbon dioxide to store energy as biomass. These processes essentially sequester carbon. For this reason, climate change is not only about reducing emissions of greenhouse gases, but also about increasing the sequestration of some of these gases (notably carbon dioxide). Despite the fact that most of the human emissions of carbon dioxide today come from developed countries, most of the sequestration of carbon by natural processes is taking place in developing countries. This means that implementation of the Climate Change Convention should not be limited to activities that help reduce emissions of carbon dioxide, but could

also encompass those that help in the sequestration of this gas. If carbon sequestration projects are eligible under the Clean Development Mechanism (CDM), how can this help generate funds for biodiversity conservation? The economic net benefit to the world of an agreement to sequester carbon by permanently protecting 650 million hectares of the Amazon has been estimated to be anywhere between \$58 billion and \$3.9 trillion. A more realistic median estimate is \$713 billion. This implies a net annual benefit of about \$70 billion, or approximately 0.2 percent of world GDP (Lopez, 1997).

The World Bank is exploring a Carbon Investment Fund as part of its Global Carbon Initiative (GCI). This fund would obtain money from industrialized countries and the private sector in order to invest in emission reductions for economies in transition and, potentially, developing countries. The GCI is consulting extensively with developing and developed countries and the private sector to investigate creating this voluntary market mechanism.

The UN Conference on Trade and Development (UNCTAD) and the Earth Council, supported by Centre Financial Products Limited, established a Greenhouse Gas Emissions Trading Policy Forum in June of 1997. The goal of the Forum is to launch a multilateral market for trading in greenhouse gas emission allowances and reduction credits by the year 2000, thus contributing to the early and effective implementation of the Kyoto Protocol. The forum is closely coordinating its work with the Secretariat to the Climate Change Convention and other international and corporate trading initiatives including the OECD and IEA, the World Bank, the IPCC, UNDP, UNEP, the Center for Clean Air Policy, the World Resources Institute, the Environmental Defense Fund, British Petroleum and Resources for the Future.

Regardless of the complex issues that still surround the CDM, private companies, NGOs and governments are already experimenting with concrete examples. For instance, an electric utility in the United States has provided millions of dollars for the protection of a rainforest in Bolivia in the hopes that it will one day get "credits" for the carbon it is helping sequester. There are many other similar examples in the region and elsewhere. All

of this has led some observers to speculate that the market for carbon sequestration will one day be huge and capable of supporting a whole new kind of biodiversity-based business.

Other Conventions

While joint implementation is a concept that has, to date, only been applied to the UN Framework Convention on Climate Change, it is conceivable that similar mechanisms could be used to help implement other UN conventions, notably the Convention on Biological Diversity. The law of diminishing returns and the economic dynamics that make it cheaper to implement the climate change convention in developing countries as opposed to developed countries also apply to the CBD. For instance, the CBD calls for countries to “save, study and sustainably use” biological diversity, which means investing money in protection of ecosystems, in conservation projects, in research projects and in projects designed to use natural resources sustainably. What if developed countries could get “credit” for financing biodiversity conservation in developing countries? Might we see a market develop similar to the one that is currently being developed as a result of the climate change convention? Clearly, the

politics, the stakeholders, and the stakes involved in biological diversity are very different from those involved in climate change. Nevertheless, the issue of joint implementation of conventions other than the climate change convention might be further explored while recognizing the common but differentiated responsibilities of developed and developing countries.

Finally, as a good example of both user fees and carbon sequestration, Costa Rica has initiated a

Box 6

Costa Rica: Tools for Financing Biodiversity

The government created the National Forestry Office and the National Forestry Fund (FONAFIFO) on the basis of the Forestry Law of 1996. The role of FONAFIFO is to compensate forest owners and managers for reforestation and for activities that help protect native forests. Financing for FONAFIFO comes from a variety of sources:

- (i) a tax on gasoline,
- (ii) a tax on wood products,
- (iii) the emission of “forestry bonds”,
- (iv) pollution and other environmental fines, and other revenues coming into the Ministry of Energy and the Environment.

Additionally, there is the possibility that FONAFIFO will obtain money through the sale of watershed services, for instance through an arrangement negotiated with Energia Global, a private electricity provider, which has offered landowners in its watersheds a payment (effected through FONAFIFO) of \$10 per hectares per year to maintain forest cover on their plots. The sale of carbon sequestration credits negotiated through Costa Rica’s National Joint Implementation office is also a potential source of income to the fund. Nine joint implementation projects (five in energy and four in land use) were approved by the Climate Change Convention for Costa Rica. These were managed and coordinated by the Costa Rican Joint Implementation Office (OCIC). Through the creation of OCIC, Costa Rica became one of the first countries to benefit financially from the sale of carbon sequestration services to the developed world. FONAFIFO can use its funds to pay private landholders for reforestation (current payment is \$492 per hectare, forest management \$329 per hectare, and forest protection, (\$49 per hectare). The program to provide compensation for the environmental services provided by forests started making payments in 1997; the demand has been strong and resulted in disbursements of \$14 million in 1997 for a total of 79,000 ha of forest protection, 10,000 hectares of forest management and 6,500 hectares of reforestation. An application backlog exists of about 70,000 hectares. As a result, clear prioritization guidelines need to be developed.

There are no current plans to use the provision of scenic views and the protection of biodiversity as sources of financing, despite the fact that the Forestry Law does recognize them as valuable services provided by forests.

Source: Chomitz et al., 1998; Echavarría, 1999; UNDP, 1998.

program to compensate forest owners (private as well as public) for the services the forests provide (see Box 6). The idea behind this initiative is that the government of Costa Rica will serve as a clearinghouse, collecting money from the beneficiaries (national or international) of the goods and services provided by the country's forests (services that include carbon sequestration, watershed protection, ecotourism and scenic values). They will then distribute the money collected to the forest owners/managers, whether they are public (such as the National Parks System) or private

(small landholders). The system is difficult to implement and is not yet fully operational, but it is an interesting example of how the government might help consolidate the money collected from a variety of goods and services provided by forests and thereby minimize transaction costs. In addition, the system provides a mechanism for small, private landholders that protect their forests to benefit from forms of revenue generation (carbon sequestration and taxes on petrol) that are complex and to which they would not otherwise have access.

Chapter IV

Biodiversity as Business

Overview

There are cases where the interests of business and biodiversity conservation coincide and the links between business and biodiversity are already getting closer. An increasing number of business leaders now agree that the environment (and its problems) can be looked upon as one of the most important commercial opportunities of the coming decade. The past ten years have seen the creation of companies with missions that are both good for business *and* good for the environment. This suggests that new and innovative financial instruments can be developed which will encourage these developments and further this trend. This will be especially important when it relates to innovative small and medium-sized biodiversity-based enterprises operating in developing countries, because the collective impact of these enterprises on the economy—and on the global environment—is huge.

Of the utmost importance in this context are certification systems (such as in the case of certified timber and certified organic products), which inform consumers about environmentally-friendly products and sometimes allow these products to be sold at a premium (Harkalay, 1996). The so-called “green trade” that certification promotes helps pay for the added cost of sustainable production methods and improves potential investor returns.

Given certification and the appropriate business environment, biodiversity-based products can be big business. Although precise information on the overall extent of the trade is still scarce, an indication of the current value of trade in selected non-timber forest products is one example. According to FAO (1997), much of the trade in non-timber forest products is from developing to developed countries, with about 60 percent being imported by the European Union, the United States and Japan. Major suppliers of these products are China, India, Indonesia, Malaysia, Thailand and Brazil. Most of this trade comprises products in their raw or semi-

processed form and represents a potential source of income from forests with low timber production potential (FAO, 1997), although more research is needed to fully assess the development potential. Nevertheless, developing countries may have an opportunity to capture a larger part of the market and increased investment in biodiversity-based products. But this will only happen if they develop the capacity to supply high-quality products, preferably in semi-processed or fully processed form. Investments in capacity building, training and technology transfer will often be needed to facilitate this change.

Additional data indicating the extent of some biodiversity-based businesses in developed countries are listed below (TNC, 1999).

- (i) The natural and health foods industry in the United States has grown by 22 percent in the last few years, with sales reaching \$7.38 billion in 1995.
- (ii) Organic products have shown similar growth rates, with projected sales in 1996 estimated at \$3.3 billion.
- (iii) The demand for certified timber increased at an annual rate of 50 percent.
- (iv) Over the past ten years, in the United States alone, retail sales of “green” products have jumped by 233 percent.
- (v) Sales between 1991 and 1997 at Whole Foods Markets, a supermarket chain dedicated to organic and health foods, grew from \$91 million to \$1.1 billion. During that same period, profits went from \$1.6 million to \$26.6 million.
- (vi) Bloomberg predicts that “green” sales will total \$30 billion by the year 2005.

Although the signs seem good, the development of biodiversity-based businesses will not happen in isolation. It will require guidance and active support from governments, investors, the financial community and most of all, informed and responsible consumers. The remainder of this chapter

takes a closer look at some of the financial mechanisms that can be used to encourage synergy between business and biodiversity. They include loans to biodiversity-based businesses, venture capital, guarantees to biodiversity-based businesses and securitization. We will also look at some measures to help biodiversity-based businesses build capacity.

Loans

When promoting the establishment of biodiversity-based businesses, access to capital at a reasonable cost will often be the most important determining factor. For this reason, special lines of credit (preferably at concessionary rates) made available to small-and-medium-scale enterprises (SMEs) in industries that are good for the environment can serve as an important incentive for biodiversity conservation. This form of “green credit” can help create an environment in which environmentally responsible (and commercially viable) businesses can serve as models and attract larger private capital flows.

GEF's SME Program

One example of a program designed to use credit as a way of stimulating biodiversity-based businesses is the GEF Small and Medium Enterprises Program (Rubino, forthcoming). This program was started using \$4.3 million in GEF money, managed by the International Finance Corporation (IFC), to stimulate greater SME involvement in addressing the GEF's biodiversity and greenhouse gas mitigation objectives. Projects supported under this initiative are in the areas of renewable energy, energy efficiency, sustainable forestry, sustainable agriculture and ecotourism.

The GEF approved a \$16.5 million replenishment and expansion of the SME program in 1997. The program has helped gain experience in: (i) the ability of SMEs to implement projects that address GEF objectives, (ii) the financial viability of these activities and the potential for commercial financing and (iii) the ability of financial intermediaries to deliver GEF program funds to SMEs.

Financial intermediaries participating in the GEF's SME Program are attracted to it because it offers low interest loans, credit enhancement (guarantees), co-financing and technical assistance. It also reduces their average cost of capital (because the GEF provides risk capital on a grant basis), increasing program viability. As with grants (and for similar reasons), intermediaries supplying credits to biodiversity-based businesses need to be carefully selected. Experience with using intermediaries to provide loans to biodiversity-based SMEs is still limited, but lessons stemming from the establishment of SME credit lines in general (i.e. those not specifically focused on the biodiversity business sector) could be applicable. (IFC, 1997)

Dutch Green Funds

Another example of the use of “green credit” to stimulate biodiversity-based businesses comes from The Netherlands. As of 1995, the government of The Netherlands agreed to provide tax exemption for money invested through so-called “Green Funds” which offer loans to approved environmental projects. Following the enactment of this law, a number of major Dutch banks began offering tax-exempt Green Funds to their customers (see Box 7). The case of The Netherlands is still unique, but it shows that by providing tax incentives, governments can play a leading role in stimulating green credit.

Box 7
The Netherlands: Dutch Green Funds

As a result of a Green Investment Protocol adopted by the Dutch government in January of 1995, the income and dividends earned through investment in approved environmental funds (called "Green Funds") are tax exempt, including taxes on capital gains. To be eligible for this exemption, the "Green Fund" must be a part of an approved Dutch financial institution and must invest its money in environmental projects as defined by the government. It must invest at least 70% of overall capital on projects approved by the Dutch government through the Ministry of Housing, Spatial Planning and Environment. Since its inception, this simple law has mobilized substantial funding for qualifying projects.

To date, the Dutch Green funds have allocated most of their money to projects related to nature conservation (\$293 million), closely followed by energy distribution projects (\$223.5 million), organic farming (\$110 million) and wind energy (\$87.5 million). It is estimated that a further NLG 2 billion (\$1 billion) were made available for qualified green projects in 1998.

In addition to generating substantial amounts of money for environmental projects in The Netherlands, the creation of these Green Funds has helped raise environmental awareness among individual depositors and the banking sector. For entrepreneurs seeking to create biodiversity-based businesses or environmental businesses, it has meant access to capital far below commercial market rates (some have been able to secure 10-year loan commitments for their projects at approximately 2% below commercial rates). To date, the average project size is \$2.5-\$3 million.

Effective 1998, certain environmental projects (forestry, nature conservation, etc.) will be eligible to receive financing for an extended period (30 years instead of the usual 10). The rationale for this is that such projects require greater financial support to become feasible.

As of June 1998, projects in less developed countries and countries with which The Netherlands maintains a long-term development relationship, have become eligible to receive investments from Dutch Green Funds. In Latin America and the Caribbean, Bolivia, Costa Rica, Peru and Jamaica are specifically mentioned as eligible for money from the Dutch Green Funds, but other countries in the region may qualify as well.

Sources: T. Bellegem 1999 and Groen Beleggen, 1997

Export Credit

Export credits could also be used to stimulate the development of biodiversity-based businesses in LAC. Traditional export credit is usually provided by the export/import banks of developed countries to promote the sale of that country's goods and services and, in so doing, create jobs. Following the lead provided by national export credit agencies, the multilateral development banks have also used export credit to stimulate trade in developing countries. Just as export credit can be used to create jobs at home or as an incentive for international trade, it could conceivably be used to further stimulate the development of biodiversity-based businesses. If it is to work properly as an incentive to these sorts of businesses, however, it will need to be provided at preferential and concessionary rates.

There are a number of ways that national, regional or multilateral agencies could encourage the development of green export credits. For example, a system could be designed to complement existing export financing instruments offered by agencies such as the Latin American Export Bank. They might include *pre-export facilities* such as working capital guarantees and renewable insurance policies for short-term export credit sales and *post-export facilities* dedicated to financing and protecting receivables and extending credit terms to foreign buyers.

In this regard, multilateral organizations could work closely with their client governments to facilitate green export credits through the provision of loans and reinsurance instruments. It may also make sense to encourage the creation of new na-

Box 8
Regional: The Terra Capital Fund

In late 1998, a consortium made up of the Environmental Enterprises Assistance Fund (EEAF), a Brazilian Bank (Banco Axial) and Sustainable Development Inc. (SDI), working with the World Bank's International Finance Corporation (IFC), announced that they had secured the capital necessary to establish a private, for-profit, environmental venture capital fund for Latin America called the "Terra Capital Fund". The fund obtained money from a variety of sources, private and multilateral (including from the IDB through the MIF as well as from the Swiss government), in order to invest in small, private businesses that meet a set of environmental criteria for biodiversity funding. In addition, Terra Capital received a US\$5 million grant from the GEF.

The fund will invest in mostly small- to medium-sized companies, providing funds for start-up and expansion, anticipating the use of proceeds for restructuring, modernization, acquisition, new products development and similar activities. Investment must comply with the environmental criteria, established by its Biodiversity Advisory Board. The Fund will make minority investments that range from the equivalent of US\$500,000 to a maximum of 15% of the Fund's total committed capital.

Sources: IFC, 1997; Keipi 1999.

tional (or regional) export credit agencies, if this is warranted by sufficient export volume.

Venture Capital

Another way of addressing the special needs of biodiversity-based businesses is through equity or quasi-equity investments via dedicated venture capital funds or sector investment funds (Asad, 1997). Like traditional venture capital funds, these tools are designed to provide capital in return for equity or quasi-equity positions in promising biodiversity-based businesses. While green venture capital funds can be high-risk/high-return operations, they can also serve to provide much needed capital (as well as business expertise) to small, biodiversity-based start-ups. Two examples of recent initiatives designed to use investments in equity or quasi-equity to stimulate the conservation and sustainable use of biodiversity are the Terra Capital Fund with multiple sources of financing (Box 8) and the EcoEnterprises Fund financed by the MIF (Box 9).

The EcoEnterprises and the Terra Capital funds will face similar challenges. Notably, they will

need to find businesses that combine financial profitability with biodiversity conservation. The EcoEnterprises Fund will only invest in projects that combine nongovernmental organizations and private businesses in some form of partnership. In addition, it will finance capacity-building and business development projects.

These funds are pioneering initiatives designed to experiment with the role that venture capital can play in supporting biodiversity conservation. Depending on their success and profitability, they may help stimulate other such undertakings in the region. The two initiatives are also mutually supporting. Whereas the EcoEnterprises Fund will focus on start-up ventures, which tend to be smaller, riskier and more difficult transactions, Terra Capital will probably end up working with larger projects. This means that projects supported by EcoEnterprises may eventually "graduate" into support from Terra Capital. In addition, by building the capacity of environmental businesses in LAC, EcoEnterprises could help mold a stronger project pipeline for Terra Capital. Finally, the two funds may even end up co-financing certain ventures.

Box 9
The MIF/TNC EcoEnterprises Fund

A green venture capital fund for Latin America was created in 1998 by The Nature Conservancy and the Multilateral Investment Fund of the IDB. The fund, known as the EcoEnterprises Fund (or *Fondo EcoEmpresas*), is a \$10 million operation designed to provide venture capital and technical support to environmentally responsible business projects in LAC. It will help achieve two crucial goals: spurring the growth of small- and medium-sized companies, which is key to the economic future of Latin America and the Caribbean, and promoting the conservation of one of Earth's most biologically important regions.

The EcoEnterprises Fund aims to foster the development of socially and environmentally responsible enterprises, to generate revenue for biodiversity conservation and enhance the long-term sustainability of nonprofit environmental organizations in Latin American and the Caribbean. Target sectors include alternative agriculture, including organic foods, apiculture and aquaculture, sustainable forestry, nontimber forest products and nature tourism.

The fund has two components: a \$6.5 million venture fund to invest in enterprises at all stages of development and a \$3.5 million technical assistance fund to provide business advisory services to help them succeed. The Nature Conservancy serves as fund manager. It is expected that beginning in August of 1999, the EcoEnterprises Fund will provide equity and loans to enterprises undertaken by private businesses in cooperation with local nonprofit institutions. Over a 10-year period, the fund will provide between \$50,000 and \$800,000 (with an average of \$150,000) to as many as 25 ventures in the fields indicated above. Revenues generated by the ventures will contribute to the long-term financial sustainability of the participating environmental organizations and demonstrate ways to integrate economic growth and environmental protection.

The fund will seek to leverage the Conservancy's network of business and environmental conservation partners to generate sufficient deal flow and strong model projects. The Conservancy aims to foster working relationships between these players to enhance returns and reduce risks.

Source: TNC, 1999.

Guarantees

Another mechanism for supporting biodiversity-based businesses in LAC is guarantees. Internationally, there is a well-established system for providing guarantees against a variety of business risks. That system includes agencies such as U.S. Overseas Private Investment Corporation (OPIC), the U.S. Export/Import Bank (ExIm), the World Bank's Multilateral Investment Guarantee Agency (MIGA), as well as many of the export credit agencies of developed countries. A guarantee is

essentially a form of insurance coverage against some of the risks that businesses face. Guarantees generally come in two forms:

- (i) Guarantees against commercial risk which cover businesses against events such as nonfulfillment of contracts and nonpayment of loans, among other things.
- (ii) Guarantees against political risks, which cover businesses against events like wars, civil disturbances, devaluations and the expropriation of goods.

Box 10

Costa Rica: MIGA and the Rainforest Tram

An example of the use of guarantee instruments to encourage environmental activities is the case of two guarantees provided by MIGA. In 1995, MIGA supported the construction and operation of a 1.3 km. aerial tram, a restaurant, and a visitor research center located on a 338 hectares site bordering Braulio Carrillo National Park in Costa Rica (50 km. north of San José). MIGA issued guarantee contracts covering foreign investment in Dosel S.A., a special purpose company set up to run the Rain Forest Aerial Tram (RFAT). One contract guarantees the equity invested by Conservation Tourism, Ltd., of the United States against currency transfer risk; the other guarantee contract covers Bank of Nova Scotia's (Canada) nonshareholder loan to Dosel against Transfer Restriction, Expropriation, and War and Civil Disturbance.

The project is structured to preserve Costa Rica's rain forest and ensure that its economic use is environmentally sensitive. Furthermore, Dosel hopes to work closely with the government to reduce illegal hunting activities in the area. Because of its commitment to the environment, the project has been named a "National Resource" by the President of Costa Rica.

In addition to making significant efforts to ensure minimal adverse impact on the environment, the company allocates resources for research and educational purposes. As of 1998, the RFAT plans to construct lodging facilities to accommodate visiting research scientists. High safety and waste-treatment standards are in place. Furthermore, the project sponsors an environmental education program to improve environmental awareness about the importance of protecting the rain forests. Within this program, admission for Costa Rican school children and students is free or reduced; 3,000 children/students participated in 1996 (an estimated 9,000 will participate in 1998).

Source: West et al., 1998.

Guarantees have traditionally been used by developed countries to encourage the export of their goods and services and by multilateral banks to stimulate investment in developing countries. Without them, many businesses now operating in developing countries would find the risks of working there too overwhelming. In a similar way, guarantees could be used to alleviate the risks (both commercial and political) of biodiversity-based businesses. Although guarantees are a promising tool for stimulating biodiversity-based businesses, they can also carry considerable financial risk. An institution providing guarantees needs to ensure that it has enough capital to cover the guarantee should it be called upon to do so. Still, this is an obstacle that can be surmounted through adequate planning. It is also an area in which MIGA, OPIC and even the MIF, institutions that are used to providing guarantees to businesses, have considerable expertise.

Lorenzo Rosenzweig (1998) has observed that in Mexico several promising biodiversity-based enterprises have been turned down by financial institutions because they were unable to offer guarantees when applying for a loan. The IFC-financed Hungary Energy Efficiency Co-financing Fund is

a useful illustration in this context because it provides partial credit guarantees and long-term co-financing support to address similar financial constraints.

The U.S. Environmental Protection Agency (EPA) has proposed a number of guarantee mechanisms that enhance the availability of credit for the environmental activities of municipalities in the United States. Generally, these guarantees are used to finance environmental infrastructure (i.e. wastewater treatment plants and solid waste facilities) and not to support activities directly related to biodiversity conservation, but there is no reason why these mechanisms could not be applied to biodiversity-based businesses. The EPA refers to these guarantees as "tools for enhancing credit" and defines them as "assurances to lenders or bondholders that credit is available and that they will be repaid if the debtor government or private party should default or delay payment."

An interesting characteristic of the EPA's approach to guarantees is that they are used to help environmental projects obtain money through capital markets, namely through the issuance of bonds. In the United States there are numerous

Box 11
The Netherlands: The POPM Mechanism

Guarantee instruments tend to be project oriented, but they can also be used to encourage the formation of venture capital funds. In 1996, the Dutch government approved the POPM (Particuliere Ontwikkelings- en Participatiemaatschappijen) mechanism, which provides guarantees to risk-bearing investments in developing countries by qualified Private Development and Venture Capital companies based in the Netherlands. Investments are approved by the Netherlands Investment Bank for Developing Countries (NIO) according to socioeconomic criteria that include job creation and the environment. These investments can in principle be coupled to political risk insurance that may be available from the Dutch Credit Insurance Company (NCM), as well as funding that may be secured from the Green Funds described in Box 7.

Source: NIO., 1996.

examples of the use of public money (from the federal government) to allow state and local governments with poor credit ratings (or no credit ratings) to access capital for environmental projects. Using only one type of credit enhancement, the so-called “State Revolving Fund (SRF) Bond Leveraging,” more than 21 U.S. states had, up until 1995, used money provided to them by the federal government for wastewater treatment to leverage a total of \$5.4 billion in additional money for their environmental projects (EPA 1997).

Although most of the experience in using these sorts of guarantees has been in the United States, the mechanism is applicable in LAC and elsewhere. In fact, there were discussions within the EPA to use the U.S. experience with credit enhancement for environmental projects as a model for similar projects in Russia. This program was never launched because of the economic crisis in Russia, but it could be adapted to help finance biodiversity-based businesses and environmental infrastructure in LAC.

Securitization

One of the newest, most controversial and perhaps most interesting developments in the world of international finance is “securitization”. Simply defined, securitization is a process whereby an asset, debt, obligation or aggregation of these is turned into a marketable security (a stock or a bond). In most cases, however, the term is used to refer to the aggregation of instruments (loans or mort-

gages) into a negotiable security. In other words, a securitization of loans happens when creditors pool a series of loans and use these assets to issue a bond that can be traded in the capital markets.

The aggregation of assets into one negotiable security is a common transaction in financial markets. It is done regularly as a way of spreading risk and encouraging investment in pools of companies that would otherwise not appeal to certain investors. It is what happens in some mutual funds that buy stocks in a range of companies and then emit a “security” or stock in the mutual fund. A variation of this is to strategically group high-risk and lower-risk investments and issue securities targeted at particular investors or risk-profiles. Using these techniques for biodiversity-based businesses would only require that techniques commonly used in capital markets be applied to this particular kind of companies.

The capital markets have years of experience in the use of these asset-backed securities. They are commonly used as a means of securitizing loans or mortgages and have even been used by musicians and other entertainers. In the first such deal, which was negotiated in 1997, the British rock star David Bowie sold \$55 million worth of bonds backed by his anticipated royalties. If entertainers can sell their anticipated royalties as securities, why not anticipated revenues from national parks, water user fees (see Chapter III) or from bioprospecting in particular countries? The problem with this idea may be that since park revenues and income from water user fees and bioprospecting are small or

hard to anticipate, the bonds may not generate sufficient financing to offset the transaction costs.

Despite these potential pitfalls, the concept of securitization as a means of financing biodiversity conservation is one that needs to be further analyzed.

Capacity Building for Biodiversity Businesses

There are a number of general activities that governments and others can undertake to support the creation and development of biodiversity-based businesses. After all, entrepreneurs will be struggling with similar challenges as they attempt to start-up, develop and expand their biodiversity-based businesses. It therefore makes sense to help them learn from each others' experiences and capitalize on the mistakes and achievements of others. For instance, most biodiversity-based businesses will need to develop business plans and build their entrepreneurial skills.

A growing number of business planning tools, with extensive reference resources, are now readily available on the market, assisting entrepreneurs with standardized approaches to the preparation and submission of business and financing plans. Such tools could be tailored to meet the needs of the biodiversity-based business sector. This technical assistance product could, for example, be packaged as a software product on CD-Rom and ultimately become a sort of "Protocol for Biodiversity Business Planning" in the region.

Recognizing the need for capacity building and training, the BioTrade Initiative (see www.biotrade.org) promoted by UNCTAD, with the support of the CBD Secretariat and other organizations, represents an integrated approach to stimulating investment and trade in biological resources. It seeks to stimulate biodiversity-based businesses through a comprehensive program of capacity building and training for all sectors of society in developing countries. The initiative opens an interesting opportunity for multilateral and bilateral agencies, as well as the private sector and NGOs, to provide financial support and col-

Box 12

Brazil: Creating Biotechnology "Centers of Excellence"

To take full advantage of their biodiversity resources, the countries of LAC will need to encourage the development of regional biotechnology industries. This means creating the necessary incentives for this industry to develop and helping build the infrastructure that the industry will need. The creation of biotechnology industry "centers of excellence", and the infrastructure that goes with it, is often a precondition to the establishment of value for biodiversity.

One interesting example of this is the case of PROBEM in Brazil. PROBEM-Amazonia (the Brazilian Program of Molecular Ecology for the Sustainable Use of Biodiversity in Amazonia) features the establishment of a \$60 million Biotechnology Industrial Center (BIC) in the Manaus Free Trade Zone. The objective of this center is to attract investment (both national and foreign) into regional biotechnology businesses in the areas of pharmaceutical products, cosmetic materials, food products, environmentally-friendly pesticides, enzymes of biotechnological interest, essential oils, antioxidants, natural dyes and fragrances.

PROBEM operates by providing monetary and fiscal incentives to people and industries willing to invest in biotechnology and help create biotechnology industries in Manaus. Some of the incentives include: 10-year income tax exemptions, value-added tax exemptions for products made in the Amazon using agricultural raw materials and plant extracts from the region, import tax exemptions on foreign goods destined to be consumed or used for manufacturing in Manaus and/or re-exported, export tax exemption for all products manufactured in the Free Zone that are exported, sales tax exemption on consumer goods and consumption, including taxes on energy, fuels, transportation and communications services, capital gains tax exemption on certain items and concessionary prices on lands for companies to install manufacturing plants.

The provision of these types of incentives may be a way to capture more of the value-added from biodiversity-based businesses in Latin America and the Caribbean.

Source: Information obtained from PROBEM and BIC brochures

laborate on a concerted effort at capacity building and training for biodiversity-based businesses. The effort includes market research and policy analysis, web services and communications and results-oriented country programs.

In the future, accelerated development of the biodiversity business sector should be promoted, albeit with caution. This can be accomplished by gradually capitalizing additional funds and instruments (such as those described above) in parts of LAC not yet adequately covered by existing instruments. At the same time, efforts could be made to ensure that there is a supportive environment for biodiversity-based businesses. This could include initiatives such as research to better quantify the volume of demand for different types of financial instruments and analyze the nature of such demand (i.e. at which stage of the business' devel-

opment and for what purposes financing is needed). This "market research" would help map-out the financing needs of biodiversity-based businesses throughout the region as well as help support the establishment of future financing mechanisms.

Similarly, efforts can be made to help exchange information on the emerging biodiversity business sector. Such information would be of interest to the financial community as well as to policymakers, entrepreneurs, international donors and other stakeholders. It would help stimulate cooperation, promote the exchange of learning and experience, reduce business and financial risks and stimulate co-financing opportunities. The Internet is an excellent way of implementing these information exchange programs.

Chapter V

A Way Forward

The cost associated with arresting degradation of the natural environment and improving the urban environment is enormous, not only in terms of financing, but also in terms of the need to create the appropriate institutional and technological capabilities at both government and private sector levels. This is an effort which will require substantial support from the international financial institutions...

Therefore, solutions to environmental problems, especially global problems, must take imaginative approaches and must envision the availability of financing on concessional terms for environmental projects and components with distinctly global benefits including, for example, projects related to the implementation of the Biodiversity and Climate Change Conventions...

An ongoing search for opportunities to aid in the conservation of biological diversity.

In summary, the Bank is in a unique position to assist its borrowing member countries in making efforts that will lead to sustainable development in the 1990s...

Report on the Eighth General Increase in Resources of the IDB
(IDB, 1994)

Mandate of the Inter-American Development Bank

Despite a clear mandate stemming from the Eighth General Increase in the Resources of the IDB (IDB-8) in 1994, the Bank faces serious constraints in its efforts to finance biodiversity conservation and sustainable use. In 1999, the Bank spent about 95 percent (92 percent in 1998) of its environment-related loans on projects that deal with the urban environment, pollution control and natural disasters and only a very small percentage on natural resources management. This can probably be explained by the fact that biodiversity is, for the most part, a public good and it is difficult to charge for its use or conservation. In addition, biodiversity provides global benefits, while the direct costs and opportunity costs of its conservation are borne by the borrowing country. This explains why governments are unwilling or unable to take out loans to finance a public good, since it is difficult to see how conserving biodiversity might be able to “pay for itself”. Since grant and concessional resources are scarce, financing biodiversity is, indeed, a great challenge for the Bank.

Developing a Strategic Framework

Given the constraints facing the Bank with respect to conservation lending, it is important that it consider developing a strategic framework for addressing biodiversity issues, including some of the following elements: a mission statement, continued efforts to minimize the impact of lending operations (“Do No Harm”), applying emerging financial tools and resources, building capacity and promoting demand and finding financing partners and forming strategic partnerships.

A Clear Mission Statement

A mission statement may serve to define the Bank's biodiversity goals, reaffirm the mandate provided by IDB-8 and guide the development of all other components of the strategic framework. Currently, the Bank lacks a clear, well-defined and well-understood mission on biodiversity. This has made it difficult for the Bank to explore and develop mechanisms for financing its conservation.

Do No Harm

An essential element of mainstreaming biodiversity is to ensure that public and private development activities “do no harm”.

Box 13

IDB: A Proposed Biodiversity Mission Statement

“The Bank seeks to accelerate the conservation and sustainable use of biodiversity in Latin America and the Caribbean through continuous improvement of its existing financial mechanisms, implementation of new and innovative financial mechanisms, strong technical assistance programs, value-added partnerships with biodiversity’s multiple stakeholders, civil society participation and a knowledgeable and dedicated staff.”

In order to minimize the impacts on biodiversity, rigorous criteria need to be applied in the environmental review of development activities. Some future losses of biodiversity will be inevitable, but defining clear priorities and guidelines could minimize these. In this context, the experience of the World Bank, which introduced new biodiversity assessment procedures in 1997, may provide some lessons. Biodiversity impact assessments may identify not only problems to be avoided or mitigated, but also opportunities for conserving or enhancing biodiversity. For example, in the case of water supply projects, protection of upstream forests that provide watershed services, sometimes make traditional infrastructure loans more sustainable while also helping conserve the biodiversity in these forests.

Recent discussions at the World Bank suggest the possibility of water markets in the Americas, where charges on drinking water downstream would help pay for biodiversity conservation upstream (see for example, the Ecuadorian Water Fund, Box 5). In addition to “do no harm” requirements, staff training programs will contribute to mainstreaming biodiversity. Development of certain tools, such as a checklist (or scorecard) would help establish a “biodiversity early warning system” that would permit staff to avoid (or at least mitigate) harm to biodiversity. These training programs and tools could be developed in con-

junction with other organizations, including IUCN or an NGO with similar qualifications, the World Bank, UNDP and others trying to implement similar training programs and/or tools.

Apply Emerging Tools and Resources

Beyond making the most of existing tools and mechanisms to finance the conservation of biological diversity, the Bank should also seek to innovate, to look at new and emerging mechanisms that have relevance to the situation in Latin America and the Caribbean. This paper has touched on a variety of financing mechanisms that can help finance biodiversity conservation and sustainable use. In addition, the Bank should continue to encourage systemic reform and environmental taxation, as was discussed in chapter III.

Build Capacity, Promote Demand

Another approach—and perhaps a long term strategy—would be to work with borrowing country governments to “build capacity in order to induce a demand” for biodiversity-related projects. While continued efforts are needed to analyze how biodiversity investments can be cost-effective, in practice, the best way for inducing demand is to develop biodiversity-related projects that generate revenue and pay for themselves. In addition, training and capacity-building on the economic, environmental and social importance of biodiversity conservation and sustainable use will also induce demand.

Find Financing Partners and Form Strategic Partnerships

There are a number of organizations working on biodiversity conservation, on developing biodiversity-based businesses and on financing biodiversity. The IDB should seek to work closely with them. They include: the GEF, IUCN and environmental NGOs, the World Bank, bilateral donors, the European Union through its European Development Fund, UNEP, UNDP, UNCTAD, community groups (e.g. indigenous peoples’ solidarity groups), the World Business Council on Sustainable Development (WBCSD) and many others. With such a wide range of actors, the Bank should explore mechanisms for collaboration, areas of

common concern, possibilities for co-financing, and opportunities for synergy with these organizations in Latin America and the Caribbean.

This collaboration should go beyond inter-agency agreements. The business community has great potential on issues of biodiversity. For the Bank to be effective in the conservation of biological diversity in the region, it must work closely with the private sector. One organization that may be able to help in this regard is the WBCSD. It was originally created to provide input into the UN Conference on Environment and Development in Rio, but has since become an effective and well-established global network of business leaders with an interest in sustainable development. In addition, the WBCSD is firmly entrenched in the region, with

offices in Mexico and Brazil and representation in various other countries. The Bank could, therefore, initiate a dialogue with the WBCSD on the conservation and sustainable use of biodiversity and explore how the two organizations can collaborate. This collaboration could result in an action plan for the region, including awareness-raising campaigns targeted at opinion leaders from businesses and governments in the region.

Finally, venture capital companies may become important allies in the successful development of a regional biodiversity-based business sector. A partnership with such companies could offer management expertise and co-financing for biodiversity-based businesses as well as facilitate technology transfer to Latin America and the Caribbean.

Bibliography

- Artuso, A. 1997. *Drugs of Natural Origin, Economic and Policy Aspects of Discovery, Development and Marketing*. New York: The Pharmaceutical Products Press.
- Asad, M. 1997. Innovative Financial Instruments for Global Environmental Management. Initial draft of a paper presented at a meeting of the World Bank Group on Financial Mechanisms for the Environment. Mimeo.
- Aycrigg, M. et al. 1997. *Strengthening Partnerships for the Environment*. World Bank Environment Department. Washington D.C.: The World Bank.
- Bartel, C.O. and Vorhies, D. 1998. Insights from the UNEP Financial Service Initiative. Paper presented at a workshop on Financial Innovations for Biodiversity, UNEP, Bratislava, Slovakia, May 1-3, 1998. Mimeo.
- Bayon, R. and Deere, C. 1998. Financing Biodiversity Conservation: The Potential of Environmental Funds. Paper presented at a workshop on Financial Innovations for Biodiversity, Bratislava, Slovakia, 1-3 May 1998.
- Bayon, R., Deere, C., Norris, R., and Smith, S. 1999. Environmental Funds: Lessons Learned and Future Prospects. Mimeo.
- Bayon, R. forthcoming. *Financing Biodiversity Conservation: A Framework and Approach*. IUCN-The World Conservation Union.
- Birdlife International. 1996. *New and Additional? – Financial Resources for Biodiversity Conservation in Developing Countries 1987-1994*. London: Birdlife International.
- Ceballos-Lascurain, H. 1992. Tourism, Ecotourism, and Protected Areas. Paper presented at the Fourth IUCN World Congress on National Parks and Protected Areas, Caracas, Venezuela, 1992.
- Chomitz, K. et al. 1998. *Financing Environmental Services: The Costa Rican Experience*, Economic Notes, Number 10, Central American Management Unit, Latin and American and the Caribbean Region. Washington D.C.: The World Bank.
- Colombia's Ministry of the Environment. 1998. *Colombia's Financial Strategy for Sustaining Environmental Investment 1998-2007*. Bogota: Office of Financial Strategy of the Ministry of Environment.
- Conservation International, 1998. A Recent Wave of Investment Poses New Challenges for Biodiversity Conservation. *Conservation International*. Number 1, Spring 1998.
- Costanza, R. et al. 1997. The Value of the World's Ecosystem Services and Natural Capital. *Nature*, Vol. 387, pp. 253-260.
- de Moor, A.P.G. Key Issues in Subsidy Policies and Strategies for Reform. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- Dourojeanni, M. J. 1997. Public Sector Roles and Economic Policies Affecting Biodiversity Conservation in Latin America and the Caribbean. In *Investing in Biodiversity Conservation*. Sustainable Development Department. Technical paper. ENV-111. Washington D.C.: IDB.
- Dowdeswell, E. 1997. The Environment and Financial Performance. Speaking notes of the Executive Director to UNEP's Third International Roundtable Meeting on Finance and Environment, New York, May 22-23, 1997.

- Echavarría, M. 1999. Agua: valoración del servicio ambiental que prestan las áreas protegidas. Draft document prepared by the Regional Technical Unit of The Nature Conservancy. Washington D.C.: The Nature Conservancy.
- EcoEnterprise Funds. 1999. Information on biodiversity based business opportunities. Arlington, Virginia, U.S.A.
- Environmental Protection Agency of the U.S. (EPA). 1997. A Guidebook of Financial Tools. Environmental Finance Program. Internet publication: www.epa.gov/efinpage/guidebk/guindex.htm
- FAO. 1994. *Non Wood News*, Volume 1. Forest Products Division. Rome: Food and Agriculture Organization of the United Nations.
- FAO. 1997a. *State of the World's Forests, 1997*. Rome: Food and Agriculture Organization of the United Nations.
- FAO. 1997b. *World Review of Fisheries and Aquaculture*. Rome: Food and Agriculture Organization of the United Nations.
- Foundation Center. 1997. *International Grantmaking: A Report on US Foundation Trends*. New York: The Foundation Center.
- French, Hilary. 1998. Assessing Private Capital Flows to Developing Countries. In *State of the World 1998*. Washington D.C.: Worldwatch Institute.
- Gandhi, V.P., Gray, D., McMorran, R. 1997. A Comprehensive Approach to Domestic Resource Mobilization for Sustainable Development. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- GEF. 1999. *Experience with Conservation Trust Funds*. Washington D.C.: The Global Environment Facility.
- Gentry, B. 1997. Making Private Investment Work for the Environment. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- Glowka, L., 1994. *A Guide to the Convention on Biological Diversity*. Cambridge: IUCN-The World Conservation Union.
- Groen Bedeggen. 1997. Annual Report. Government of The Netherlands. The Hague.
- Harkalay, A. 1996. Tropical and Subtropical Organic Agriculture: Special Needs and Systems Challenges. Paper presented at the World Trade Forum, 1996. São Paulo, Brazil: Instituto Biodinamico Boticatu.
- IBAMA and NWF. 1996. *The Green Protocol: An Unprecedented Government Initiative to Slow Environmental Destruction in Brazil*. The Cooperation and Technical Support Program of the Brazilian Institute for Environment & Renewable Natural Resources (IBAMA) and the National Wildlife Federation. Brasilia.
- IDB. 1994. *Report on the Eighth General Increase in the Resources of the Inter-American Development Bank*. Washington, D.C.: Inter-American Development Bank.
- IDB. 1997a. *1997 Annual Report*. Washington D.C.: Inter-American Development Bank.
- IDB. 1997b. *Annual Report on the Environment and Natural Resources, 1995–1997*. Washington D.C.: Inter-American Development Bank.

- IDB. 1997c. *Fondo Regional de Tecnología Agropecuaria, Plan de Mediano Plazo 1998-2000*. Washington D.C.: Inter-American Development Bank.
- IDB. 1997d. *Review of the IDB-8 Operational Program 1994-1997 (Preliminary Draft)*. Washington D.C.: Inter-American Development Bank.
- IDB. 1997e. *Mexico: Investment Fund for Small Business in the Environmental Sector (TC-97-07-37-6)*. Washington D.C.: Inter-American Development Bank, Multilateral Investment Fund.
- IDB. 1997f. *Costa Rica: Apoyo al desarrollo del uso de la biodiversidad por pequeñas empresas (TC-96-10-36)*. Washington D.C.: Inter-American Development Bank, Multilateral Investment Fund.
- IDB. 1997g. *A Preliminary Review of Brazil's Fundo Nacional do Meio Ambiente: Lessons Learned*. Washington D.C.: Inter-American Development Bank, Regional Operations Department 1.
- IDB. 1997h. *A Strategy for Poverty Reduction*. Sustainable Development Department (SOC-103). Washington D.C.: Inter-American Development Bank.
- IDB. 1998a. *Annual Report on the Environment and Natural Resources-1998*. Washington D.C.: Inter-American Development Bank.
- IDB. 1998b. *Re-Tooling of the Bank's Guarantee Program: Discussion Document*. A discussion document of the IDB's Private Sector Department, January 14, 1998. Mimeo
- IDB. 1998c. *Strategy for Integrated Water Resources Management*. Sustainable Development Department (ENV-125). Washington D.C.: Inter-American Development Bank.
- IFC. 1997. *Latin America Terra Capital Fund: Project Document*. Environmental Projects Unit. Washington D.C.: International Finance Corporation.
- IICA. 1995. *Research and Extension Projects for Food and Food-related Extract Products*. Report presented by E.J. Richardson Associates, Inc. Costa Rica: Instituto Interamericano de Cooperación Agrícola.
- IIC. 1996. *IIC Annual Report 1996*. Washington D.C.: Inter-American Investment Corporation.
- IMF. 1998. *World Economic Outlook - May, 1998*, Washington D.C.: International Monetary Fund.
- ITTO. 1996. *Changing Trade Flows: In Light of Sustainable Tropical Forest Management*. Tokyo: International Tropical Timber Organization.
- IUCN. 1996. *The IUCN Red List of Threatened Animals*. Gland, Switzerland and Cambridge, UK: IUCN-The World Conservation Union
- IUCN. 1997a. *The IUCN Red List of Threatened Plants*. Gland, Switzerland and Cambridge, UK: IUCN-The World Conservation Union.
- IUCN. 1997b. *The Global Environmental Facility from Rio to New Delhi: A Guide for NGOs*. Gland, Switzerland and Cambridge, UK: IUCN-The World Conservation Union.
- Kaiser, J. and Lambert, A. 1996. *Debt Swaps for Sustainable Development*. IUCN/SCDO/EURODAD. Gland, Switzerland and Cambridge, UK: IUCN-The World Conservation Union.
- Keipi, K. 1999. Strengths and Limitations of Environmental and Forestry Funds. In: *Workshop on Sector Support to National Forest Programs*. 25-29 August 1999. Helsinki: National Board of Forestry and Parks.
- Keipi, K. and Rubio, S. 1997. *El Banco Interamericano de Desarrollo y la biodiversidad*. The Inter-American Development Bank. Sustainable Development Department, Environment Division. Mimeo

- Lampietti, J.A. and Dixon, J.A. 1995. *To See the Forest for the Trees*. Washington D.C.: The World Bank
- Lemay, M. 1998. *Coastal and Marine Resources Management in Latin America and the Caribbean*. Sustainable Development Department, Environment Division. Washington D.C.: Inter-American Development Bank.
- Lin, See-Yan. 1997. Chairman's Summary. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- Lopez, R. 1994. *Financing Sustainability in Latin America and the Caribbean: Toward an Action Program*. Environmental Protection Division. Washington D.C.: Inter-American Development Bank.
- Lopez, R. 1997. Demand-based Mechanisms to Finance the "Green" Environment in Latin America. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- Lovink, J.S. 1997. On Bioprospecting, BioPreneurs and BioBankers, Financing and Building Sustainable Partnerships: *Towards a Practical Framework*. Preliminary draft.
- Mansfield, E. 1995. *Intellectual Property Protection, Direct Investment, and Technology Transfer*. International Finance Corporation, Discussion Paper Number 27. Washington D.C.: The World Bank.
- Markandya, A. 1997. Economic Instruments: Accelerating the Move from Concepts to Practical Application. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- McNeely, J. 1997. Achieving Financial Sustainability in Biodiversity Conservation Programs. In *Investing in Biodiversity Conservation*. Technical paper ENV-111. Sustainable Development Department. Washington D.C.: IDB.
- MIF. 1997. Confidential Report to the MIF Donor Committee on a Proposed Grant and Investment Facility for the Promotion of Environmental NGO Enterprise Development. Mimeo
- Mikitin, K. 1995. *Issues and Options in the Design of GEF Supported Trust Funds for Biodiversity Conservation*. Environment Department Papers, Biodiversity Series. Washington D.C.: The World Bank.
- Nephardt, D. et al. 1999. Large Scale Improvement of Amazonian Forests by Logging and Fire. *Nature*, April 8.
- Newcombe, K. 1997. Opportunities for the Inter-American Development Bank in Financing Biodiversity Conservation: A View from the World Bank. In *Investing in Biodiversity Conservation*. Technical paper. Sustainable Development Department ENV-111 Washington D.C.: IDB.
- NIO. 1996. *Regeling Particuliere Ontwikkelings- en Participatiemaatschappijen (POPM)*, De Nederlandse Investeringsbank voor Ontwikkelingslanden (NIO) N.V., Regeling van 2 december 1996, no. DJZ/CL-551/96.
- OAS. 1998. *Declaration of Santa Cruz de la Sierra and Plan of Action for the Sustainable Development of the Americas*. Washington D.C.: Organization of American States.
- OECD. 1999. *Development Co-operation Report 1998*. Paris: OECD.
- Panayotou, T. 1994a. *Financing Mechanisms for Environmental Investments and Sustainable Development*. Paper No. 15, Environmental Economics Series, Environment and Economics Unit, United Nations Environment Programme (UNEP). Nairobi: UNEP.
- Panayotou, T. 1994b. *Economic Instruments for Environmental Management and Sustainable Development*. Paper No. 16, Environmental Economics Series, Environment and Economics Unit, United Nations Environment Programme (UNEP). Nairobi: UNEP.

- Panayotou, T. 1995. Matrix of Financial Instruments and Policy Options: A New Approach to Financing Sustainable Development. Paper presented at the Second Expert Group Meeting on Financial Issues of Agenda 21, Glen Clove, New York, 15-17 February 1995.
- Panayotou, T. 1997. Taking Stock of Trends in Sustainable Development Financing since Rio. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- Pearce, D. (ed) 1986. *The MIT Dictionary of Modern Economics, Third Edition*. Cambridge: MIT Press.
- Pearce, D., Ozdemiroglu, E., and Dobson, S. 1997. Replicating Innovative National Financial Mechanisms for Sustainable Development. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD. Projects Unit Discussion Paper. Washington D.C.: International Finance Corporation.
- Pieters, J. 1997. Subsidies and the Environment: On How Subsidies and Tax Incentives may Affect Production Decisions and the Environment. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- Republic of Suriname and Conservation International. 1998. *The Central Suriname Nature Reserve*. Washington D.C.: Conservation International.
- Rubino, M.C. 1998. Financing Private Sector Biodiversity Projects. Paper presented at the 10th Global Biodiversity Forum during a workshop on Financial Innovations for Biodiversity, Bratislava, Slovakia, May 1-3, 1998.
- Rubino, M.C. forthcoming. *Biodiversity and Business in Latin America*. IFC Environmental Projects Unit. Washington, D.C.: International Finance Corporation.
- Seroa da Motta, R. Ruitenbeek, J., and Huber, R. 1997. Applying Economic Instruments for Environmental Management in the Context of Institutional Fragility: The Case of Latin America and the Caribbean. In *Finance for Sustainable Development: The Road Ahead*. New York: United Nations DPCSD.
- Shrivastava, J.P. et al. Biodiversity and Agricultural Intensification —Partners for Development and Conservation. *Environmentally Sustainable Development Studies and Monographs Series No.11*. The World Bank, Washington D.C., Chapters 1 and 2.
- Southgate, D. 1997. Alternatives for Habitat Protection and Rural Income Generation. In *Investing in Biodiversity Conservation-Workshop Proceedings*. Sustainable Development Department ENV97-104. Washington D.C.: IDB.
- Smith, D. 1997. Private Sector Investment in Biodiversity Conservation. In *Investing in Biodiversity Conservation-Workshop Proceedings*. Sustainable Development Department ENV97-104. Washington D.C.: IDB.
- Ten Kate, Kerry and Laird, Sarah A. 1997. *Placing Access and Benefit Sharing in the Commercial Context: A Study of Private Sector Perspectives, Draft Summary of the Results of the First Phase*, Kew, UK: World Resources Institute and the Royal Botanical Gardens.
- Terra Capital Fund. 1997. *Terra Capital Fund: Confidential Business Plan for a Biodiversity Investment Fund for Latin America*. Washington D.C.: International Finance Corporation, Banco Axial, Sustainable Development, Inc. and the Environmental Enterprises Assistance Fund.
- The Ecotourism Society. 1998. *Ecotourism Statistical Fact Sheet*. <http://www.ecotourism.org/textfiles/statsfaq.pdf>.

- TNC. 1999. EcoEnterprises Fund: Illustrative Project Pipeline and Summary Memorandum. Mimeo. Arlington, Virginia: The Nature Conservancy.
- TNC. 1997. *Water: Together We Can Care for It! Case Study of a Watershed Conservation Fund for Quito, Ecuador*. Quito, Ecuador and Arlington, Virginia: The Nature Conservancy.
- UNEP. 1992. *The United Nations Convention on Biological Diversity*.
- UNEP and TNC, 1999. Funding Protected Area Conservation in the Wider Caribbean: A Guide for Managers and Conservation Organizations. Mimeo: The United Nations Environment Programme and The Nature Conservancy.
- UNDP, 1998. Propuesta Nacional Desarrollo Forestal de Costa Rica. United Nations Development Programme, Energy and Sustainable Development Division GLO/96/104/11/31. San José.
- UNDP. 1997. Strengthening the Capacities of National Environment Funds in Latin America and the Caribbean. In *A Report on the Regional Consultation on National Environmental Funds in Latin America and the Caribbean held in Merida, Mexico, December, 1997*. New York: United Nations Development Programme
- UNDP. In press. Financial Mechanisms for Sustainable Forestry. Mimeo
- USAID. 1994. *Harvest for Progress*. Washington D.C.: US Agency for International Development.
- West, Gerald, and Tarazona, Ethel, 1998. *MIGA and Foreign Direct Investment: Evaluating Developmental Impacts*. Washington, D.C.: The World Bank.
- World Bank. 1990. *Projected Markets for Major Primary Commodities, 1990-2005*. Volume 2. Washington D.C.: The World Bank.
- World Bank. 1992. *World Development Report, 1992*. Washington D.C.: The World Bank.
- World Bank. 1997. *World Development Report, 1997: The State in a Changing World*. Washington D.C.: The World Bank.
- World Bank. 1998a. *Global Development Finance 1998*. Washington D.C.: The World Bank.
- World Bank. 1998b. *Global Economic Prospects, September 1998*. Washington D.C.: The World Bank.
- World Bank. 1998c. *1998 World Development Indicators*. Washington D.C.: The World Bank
- WRI, IUCN, and UNEP. 1992. *The Global Biodiversity Strategy*. Washington D.C.: The World Resources Institute.
- WRI, UNEP, UNDP, and the World Bank. 1998. *World Resources, 1998-99 -- A Guide to the Global Environment*. Washington D.C.: World Resources Institute.