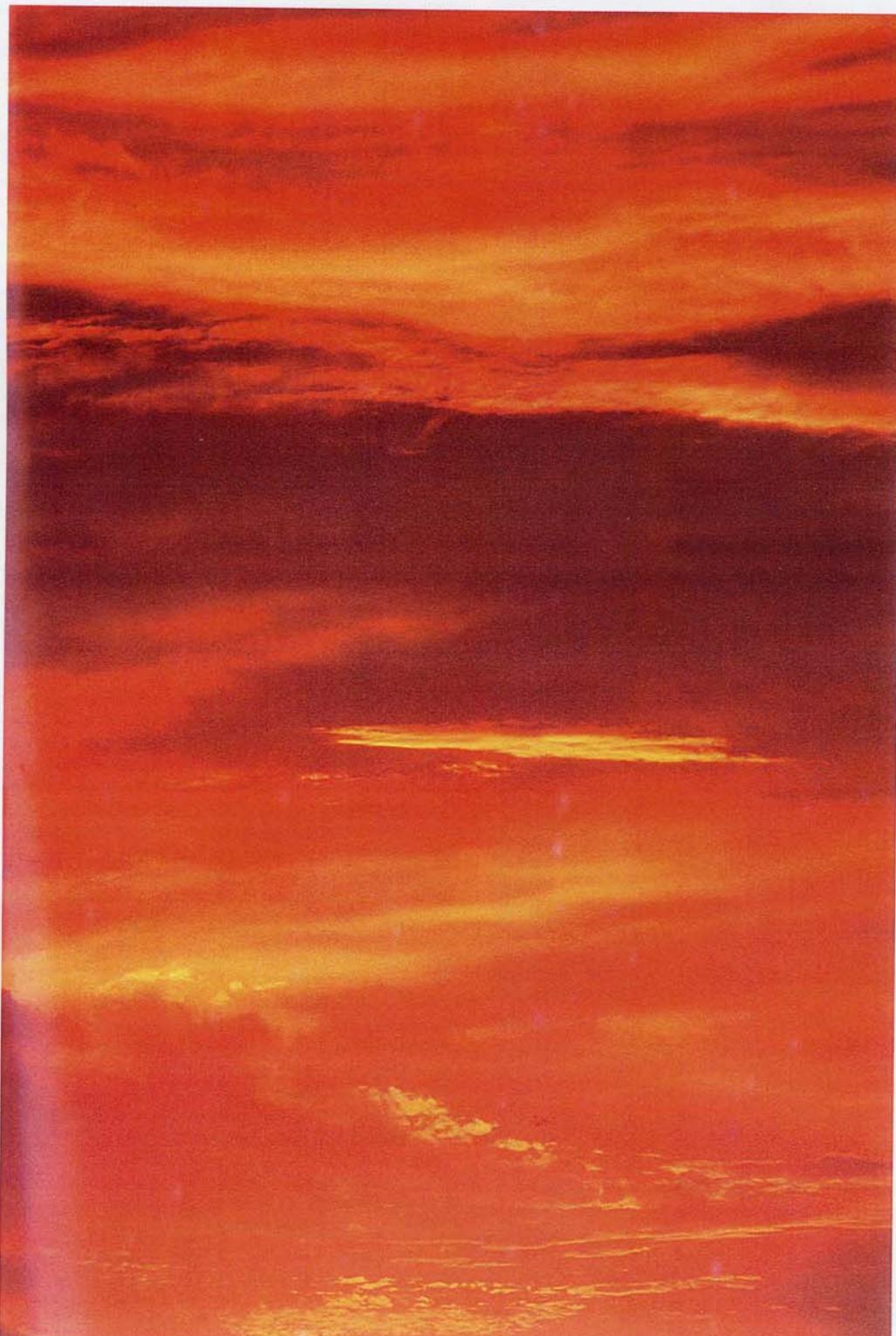


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Environmental Finance

CLIMATE CHANGE; EMISSIONS; WEATHER; INVESTMENT; LENDING; INSURANCE



Taking the wind risk out of renewables

Equity analysts
add SRI spin

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Putting a price on biodiversity

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Carbon credits: supporting sustainability in Brazil

Emerging markets in carbon, water and waste reclamation reflect a growing awareness of 'ecosystem services' such as carbon sequestration, watershed protection and biodiversity habitat and their economic value. Luis Gamez, Michael Jenkins and Jim Shields explain.

Biodiversity, the global library of our genetic resources and the services they provide - from new pharmaceuticals to new agricultural crop strains - is beginning to find innovative financial expressions and real markets. Buyers range from governments attempting to meet global accords, to companies exploring new opportunities for profits or risk reduction, to philanthropic individuals.

Clearly, we are in the chaotic early days of this market. It will not be easy to develop mechanisms and instruments capable of identifying, capturing, transacting and monitoring the values of biodiversity. A number of *ad hoc* efforts to build liquid markets by linking buyers and producers to financially important services are underway. Yet, amid this chaos, some trends are emerging that will help develop these markets. Australia and Costa Rica provide good examples.

Australia's fauna, dominated by marsupials, has no counterpart elsewhere in the world. Its flora is also unique, with fire-adapted eucalyptus forests and vast areas of arid habitat in the interior. When Europeans arrived in 1788, they used traditional agricultural techniques for both crops and animals, which have proven to be disastrous environmentally. A high rate of extinction and permanent changes to the soil's salt balance now threaten the agricultural enterprises that made the country wealthy over the past two centuries. The introduction of European fauna, particularly the rabbit and the fox, has had significant economic and ecological effects. In addition, the native population has been largely disenfranchised.

Environmental finance for biodiversity has historically been provided in Australia by the national and state governments through a system of nature reservation. Management has been conducted by government agencies. However, recent initiatives, particularly in Victoria and New South Wales, have begun to make government resources available for private land. The most progressive action for biodiversity is probably the Dutch Auction conducted recently in Victoria, which is based on the US system of paying the most efficient land holders to manage their property for biodiversity. It is called a Dutch Auction because the farmer who puts in the lowest bid for management cost is able to win the bid.

In New South Wales, the government trading enterprise, which manages the state's forests as a business, has decided that biodiversity is a part of its core business. The government has invested more than \$15 million in impact statements to determine strategy and \$8 million dollars per annum for implementation. The government spends more than \$2 million per year managing biodiversity, which is incorporated into the figures for triple bottom-line accounting. The resource managers within State Forests have developed environmental services as a business unit, and thus contribute to the economic bottom line.

Also in New South Wales, the Rice Growers Association in the state's mid-west grain belt has taken action to promote sustainability. Although it was under no regulatory pressure to do so, the association has teamed up with State Forests and other stakeholders to develop a strategy to rehabilitate the woodland habitat - which has been exploited to produce rice - along with a business plan for its implementation.

But it is recognized that these initiatives will be insufficient to solve environmental or ecological problems at the necessary scale. Economic resources must come from other sources. The rice-growing area is also affected by salinity, and has the potential for sequestering carbon at a profit.

The plan includes partnering with local indigenous people to develop nurseries for native plants required for the rehabilitation work. The total cost of rehabilitating the 200 km-long, 50 km-wide corridor between the two major rivers in the area is around \$290 million over 20 years. Investment by the rice growers and the state government will put the project into operation. The business will be set up as a land management enterprise and investors will receive carbon, salinity and biodiversity credits conforming to state, commonwealth and international standards.

Probably the best-known example of investment for profit is the Earth Sanctuary corporation set up by John Wamsley. It was created to acquire, and manage for profit, a sanctuary system that represents 1% of the area of the Australian continent. Wamsley, a mathematics professor by background, set up his original sanctuary at Warrawong in Adelaide, South Australia. Simply by excluding foxes, he demonstrated that biodiversity can be managed successfully. This original site is

now a well-established business unit and he has major sanctuaries in the three eastern states. His business is basically ecotourism. For historical reasons involving commercial exploitation of wildlife, laws in the various states prohibit actual trade in such assets, but he also has calculated the trading values of the animals he manages. However, subject to the same after-effects of the events on September 11, 2001, that have affected tourism trade globally, Wamsley's corporation has been unable to sustain profit and is now for sale.

In New South Wales, a system has been put into place for the purchase of known biodiversity values has been developed. A biodiversity value consists of a current physical asset—such as trees or koala bears—in addition to a management contract over time. Currently, a property owner can donate these values to the state through a system of voluntary conservation agreements, which specify management conditions in perpetuity. However, the new system currently being implemented is designed to allow private ownership of these measured biodiversity values, along with continued management for traditional economic purposes—such as agriculture and grazing—under prescribed conditions. In this manner, individual deals can be done, allowing profit to be made or regulations to be complied with, and eventually a market will develop around this trade.

Costa Rica is another pioneer in assigning value to its biodiversity resources. The Costa Rican government has taken seriously its signature to the 1992 Biodiversity Convention at the United Nations Conference on Environment and Development. In the 1980s, Costa Rica faced one of the highest rates of deforestation in the world and had reduced its forest cover by 25%. To reverse this trend, the government instituted innovative policies and supported the creation of the Instituto Nacional de Biodiversidad (INBio), a non-governmental organization founded in 1989 to conduct a National Biodiversity Inventory. INBio in effect became the librarian for the country's biodiversity 'volumes'. In its bio-prospecting process, INBio seeks collaborations with international industry and academia which, when realized, benefit Costa Rica's conservation and scientific capacity.

What do such collaborations entail? Business partners are interested in access to new, high-quality information and its potential commercial, technological or scientific value. INBio is committed to providing valuable information and products while increasing its institutional capacity using a sophisticated data management system and an exhaustive collection of biological samples. Maintaining strict standards for specimen labeling and tracking, INBio ensures that scientists and businesspeople interested in a particular sample can find out its exact origin and how it was collected, preserved and processed. INBio's database includes, along with taxonomic information, natural history and descriptive information that can be useful to potential product developers. To the extent that future fundamental research and product development can be carried out by national scientists, Costa Rica is destined to reap more rewards from the enterprise. But even if a product developed abroad is based on a Costa Rican sample, Costa Rica's conservation efforts benefit from up-front payments, technology transfer, know-how, capacity building and, eventually, royalty streams.

What are companies seeking to gain? The inventory and bio-prospecting programmes offer interested partners the advantage of reduced costs for the initial stages of product development. Instead of low-cost raw materials, investors receive added-value inputs and information for use in the intermediate and advanced stages of product development. In addition to these cost savings, collaboration agreements guarantee responsible investment in the sustainable, non-destructive use of natural resources, while supporting alternative livelihoods for rural poor. Examples of these alternatives include training local farmers to collect plant and insect specimens, as well as strengthened national capacity-building.

The following two deals demonstrating how such partnerships can work:

INBio-Merck Agreement -This was the first agreement with a commercial enterprise. It was signed in October 1991 and involves a search for sustainable uses of Costa Rican biodiversity in the pharmaceutical industry and veterinary science. It was renewed in 1994, 1996 and 1998 on similar terms. The agreement involved the study of a limited number of plant extracts, insects and environmental samples for extracts. It provided INBio with close to \$4 million, as well as access to technology, 'know-how' transfer, equipment and training.

INBio-BTG-Ecos La Pacifica Agreement.

In the agribusiness area, INBio seeks to integrate the result of bio-prospecting activity with the country's economic development. Local inhabitants in the Guanacaste National Park in northwestern Costa Rica detected seeds habitually avoided by pests, a behavior suggesting some type of natural pesticide action. Initial research revealed that a patent for this kind of compound was already held by the British Technology Group (BTG), a UK-based company engaged in the commercialization of agribusiness technology. The process began with a collaboration agreement involving BTG, the UK's Royal Botanic Gardens and INBio.

Innovation around biodiversity is not limited to Australia and Costa Rica. New concepts like 'mitigation banking' are popping up in the United States. These approaches take living plants, animals and ecosystems and turn them into fungible assets that can be sold through newly-formed markets. For example, US companies like International Paper and Allegheny Power are partnering with environmental groups like Environmental Defense, as well as federal agencies such as the US Fish and Wildlife Service, to save endangered species like the red-cockaded woodpecker and the gopher tortoise. And they are profiting by doing it; the asking price for a woodpecker credit today is \$250,000.

In Brazil, the state of Paraná has implemented a system of tradable forest obligations. Brazilian law requires landholders to maintain 20% of each property under forest cover. As enforcement effort has increased, it has been realized that this property-by-property requirement is both economically and environmentally inefficient, as it neither protects the highest-value habitats nor allows high-value agriculture in areas of lower environmental interest. In Paraná, landholders who are out of compliance may now buy forest protection from others with 'excess' forest within an ecologically similar region.

What does it take to set up incentives for the provision of land-related environmental services? On a small scale, *ad hoc* purchases of conservation rights provide a flexible way for buyers to obtain services of unique interest, such as protecting a particular scenic view or a unique habitat. These transactions can only work, however, with a supportive legal framework. To implement a system for environmental services on a large scale, a host region should consider a more sophisticated regulatory and institutional framework that can help mediate international transfers into local land management practices. Chomitz (2002) discusses how this might work.¹

No doubt the increasing scarcity of intact ecosystems and the biodiversity they harbour will force recognition of their value - by society at large and by specific consumers of environmental services. For biodiversity to be effectively conserved, we must scale up the activity by orders of magnitude. Despite their infancy, the emerging markets for biodiversity values hold great promise for linking profitable commercial activity with conservation objectives. This is our challenge; this is our opportunity.

¹ Chomitz, Kenneth M. (2002) "Baseline, Leakage and Measurement Issues: How Do Forestry and Energy Projects Compare?" *Climate Policy*, 2(1)

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