

4. Economic incentives and protected areas

Economic, financing and market mechanisms

Section 1

Introduction

This chapter reviews the relationship between economic incentives and protected areas and is linked with chapters 2, 3 and 5. It takes up the practical issue of how to solve the conundrum raised by valuation studies: that despite the significant economic contribution of protected areas, the market incentives to invest in these areas are extremely limited. The chapter views the problem from the perspective of the institutions responsible for protected areas and that of communities and individuals whose economic activity either affects or is affected by protected areas.

The chapter highlights five achievements of the last decade, as well as the essential challenges for the future:

- understanding economic incentives and protected area management;
- establishment of new protected areas, both public and private;
- markets for environmental services, conservation funding and protected areas;
- economic incentives and market mechanisms in buffer zone management; and
- monitoring and controlling variable and enabling incentives, particularly perverse incentives

A central problem is how to ensure that protected areas have the financial resources necessary for their maintenance, operation and protection. Maintaining PAs over the long term and integrating them into the local socio-economic landscape is not merely a matter of obtaining public funding and paying park guards. People living in and around protected areas need to be compensated for the limitations on their use of natural resources.



Compensation alone is now seen as insufficient; protected areas are also supposed to provide development opportunities for local communities. Increasing attention is being given to finding ways to ensure that those who benefit from the environmental services provided by protected areas contribute to their conservation.

Section 2

Understanding economic incentives

Biodiversity has long been regarded as a public good, and protected areas have relied heavily on regulatory approaches and the public purse for their protection and funding. At the same time, land-use activities (for example, agriculture, livestock, forestry and mining) that result in marketable products have spread widely, due to continued population growth, growing markets and financial profitability. These activities have often benefited from policies that distort economic incentives to their advantage.

There are several meanings of the term “incentive” as applied to environmental management and natural resource use. In the simplest sense, incentives provide an inducement to action (or to inaction). In economic terms, incentives are the external factors that determine production or consumption decisions, whether the economic unit is an individual, household, community or some other entity. Although incentives are usually considered to be financial rewards and penalties, economists prefer to consider them in a broader context of economic decision-making. They are “the positive and negative changes in outcomes that individuals perceive as likely to result from particular actions taken within a set of rules in a particular physical and social context” (Ostrom, Schroeder, and Wynne 1993).

Types of incentives

For economists the term “incentives” incorporates both positive and negative incentives, which take a carrot and stick approach to promoting desirable forms of development behaviour. There are direct and indirect incentives. Direct incentives are financial or other inducements and indirect incentives include both variable and enabling incentives (Knowler 1999).

Variable incentives can affect the behaviour of the producer or consumer; for example, a government tax or subsidy on farm products or farm inputs will affect the relative advantages of various agricultural products. This will in turn affect the demand for additional land and, potentially, increase the pressure on protected areas.

Enabling incentives are those policy and institutional factors that form an enabling environment for the production and consumption of goods and services. In the case of protected areas and adjacent communities, examples of important enabling incentives relating to natural resource use include the provision of land tenure, credit, information, education and technology.

Incentives – whether direct or indirect – are deemed “perverse” where they work against their purported aims. An example is an incentive that leads to deforestation, where the objective is to increase forest cover; or one that enriches the wealthy at the cost of local communities, where the objective is to reduce poverty.

Achievement: The influence of economic incentives on effective park management is increasingly realized by government, NGOs and park managers.

Ten years ago a review of PAs would not have focused on the importance of economic benefits in protected area management or the contribution of economic incentives to conservation. But now, no matter what the issue – deforestation in buffer zones, over-harvesting of resources within protected areas, or

pricing policies regarding entrance fees — practitioners have come to understand the importance of integrating economics into the mix of disciplines required for successful protected area management.

Valuation and incentives

Challenge: Protected area managers often focus on valuation as an end in itself and remain uncertain about how to define, assess and react to problems associated with economic incentives.

Understanding the values of PAs is an important step forward; these values can demonstrate that protection brings many economic benefits and should, therefore, be financed. However, valuation does not by itself determine which incentives will drive the success or failure of biodiversity protection in or outside a protected area.

It is also necessary to understand who will gain and who will lose from different courses of action. Further, it is necessary to understand where market failure is affecting participants' ability to capture the full economic benefits of conservation. Only then can a strategy be identified that will change ineffective policies, establish effective arrangements between agencies and other participants, and put in place proactive market and management policies. While the benefits of many of the services offered by protected areas and their buffer zones are difficult for individuals to capture (i.e. they have the characteristics of public goods), market-like arrangements have evolved over time.

Markets and direct payments

Achievement: Many institutions are developing approaches that employ markets and direct payments as additional tools in protected area management.

Electric power utilities that buy the carbon rights of projects protecting tropical forests, pharmaceutical companies that pay for the rights to explore marine and terrestrial protected areas for species with marketable biochemical properties, farmers who pay to protect upper catchments, farmers in buffer zones who receive annual payments to conserve their forest — they all take a direct-payment approach to the conservation of biodiversity. These initiatives are receiving increasing attention and funding. Whether this is due to a perceived failure of the effectiveness of existing conservation methods is not clear, but for the foreseeable future no protected area financing plan is complete without these market and payment mechanisms (Box 1).

Challenge: Protected area managers need to better understand the difference between financing conservation and developing markets.

PA managers must understand that economists are not fund-raisers. Economists may provide rationales for more funding, but they also need to develop market approaches that focus on innovative means of deriving income, and deciding who should be paying what and how. In addition, economists should be more active in helping PA managers identify cost-effective mechanisms, such as payments for environmental services.

Challenge: Environmental and socio-economic assessments should underpin the use of market mechanisms; at the very least they should not work against efforts to reduce poverty.

Good will, willingness to pay and self-serving interest seem to be driving the development of these markets. If the current momentum is to last, these conditions need to be encouraged. This is best done by carefully monitoring pilot projects so that experience can be shared.

Box 1. Innovative market mechanisms to provide environmental services

User fees. New and creative initiatives are in place to sell environmental services that were previously provided (at no cost) by government, the private sector or as a public good. Often the focus is on cost recovery for purchase and maintenance of the service. Sometimes funds are reinvested; for example, in the purchase of forest areas. User fees include entrance charges for public and private conservation areas and watershed management charges for public/private water and energy utilities.

Transfer payments. New systems of transfer payments for environmental services are supplementing or replacing subsidies for reforestation and forest conservation outside of protected areas. These payments provide financial incentives for land-owners to maintain and enhance environmental services. Although payments are made to land-owners they are usually transferred through an intermediary. These schemes are often partnerships between the public sector, private companies and civil society organisations. An example is the Payments for Environmental Services provision of the Costa Rica Forestry Law and its implementation by the National Fund for Forestry Investment (FONAFIFO).

Marketable Permit Systems. The international community, governments and even NGOs are increasingly using marketable permit systems in cases where an acceptable level of resource use or pollution can be determined and the initial rights to use or to pollute can be allocated. Marketable Permit Systems allow permits to be distributed in an economically efficient way, generating a market for pollution credits, in the form of offset projects that produce environmental services. Offsets for carbon emissions under the Clean Development Mechanism and salinity trading/credits in the Murray-Darling River Basin are examples.

Product labelling. This conveys information to the consumer about a product's environmental characteristics, source and production methods. Given such information, consumers may prefer a "green" labelled product to a non-labelled one. This gives the producer the potential to improve market access and share. Wood from forests certified in accordance with the Forest Stewardship Council's requirements is stamped with the FSC seal when it goes to market, and agricultural products such as coffee and bananas are labelled under the ECO-OK program of the Rainforest Alliance.

Voluntary Contractual Arrangements (VCAs). These are contracts between the producer and the consumer of an environmental service for the exchange of a resource, service or ecosystem. Typically, such contracts benefit both parties through an exchange of responsibilities and rights without the need for formal regulation or definition of property rights over the environmental services concerned. Examples include watershed management contracts between upstream land users and downstream hydrological service users such as Costa Rica's La Esperanza Hydroelectric Project and the Monteverde Conservation League.

Tradeable Development Rights for Environmental Services (TDRs). These are specific use rights associated with property (land in particular) that produces environmental services. The specific rights that govern the development of the property can be sold to conservation buyers, thereby limiting the extent to which the current or subsequent owner can curtail the provision of environmental services. Where the legal, monitoring and enforcement capacity are present, TDRs are an alternative to the outright purchase of land. Conservation easements are the principal example of this approach; they began in the United States in the 1970s as a means of conserving rural agricultural landscapes, but are now increasingly used as a way of conserving land in its natural state.

Developing Property Rights for Environmental Services. Legal, regulatory or administrative establishment and allocation of property rights (whether vested in the state or private entities) for environmental services or biodiversity serves allows markets for these services to develop. Legal and enforceable property rights over species and their biochemical and genetic information, for example, allow protected area managers to claim a share of fees and profits obtained through biological prospecting, as in the case of the Costa Rican National Biodiversity Institute.

Section 3

Establishing new protected areas

In past decades there was general concern over the degree to which important ecosystems were protected. Many countries have increased the amount of land under protection, although for different reasons and by way of different mechanisms.

Achievement: The extent and number of ecosystems gazetted as officially protected has increased in many countries.

Government programs in developed countries that restored native habitat and retired farmland from use have had an important impact on protected areas. In the United States, increasing restrictions on the use of private land and waterways under the *Endangered Species Act* and efforts to limit the commercial use of government-owned lands (by, for example, closing off large areas of U.S. Forest Service lands to roads and logging) have contributed to a higher degree of conservation on both private and public lands and waters.

In developing countries, efforts have been made to increase the area under protection:

- during the 1990s, Cambodia established a protected area system covering 19 per cent of its total land area
- Thailand has plans to increase its protected area to 21 per cent;
- Lao PDR has created a new protected area system that covers 12 to 14 per cent; and
- Vietnam has increased its special use forest area to 6.5 per cent, with plans to increase it to 8 per cent.

Challenge: Shortages of funds limit the ability to establish and effectively manage new areas, particularly in poorer countries.

There is a need to be realistic in balancing the desire for international standards with the limited funds available for effective management. The expansion of national systems has often led to “paper parks,” areas that appear as protected areas on the government books but are in fact used for other purposes. This may occur when the funds are not available to purchase the land, or to manage it effectively.

Global Environment Facility (GEF) resources devoted to protected areas (along with most official bilateral and multilateral assistance for this purpose) may not be used for land purchase. Instead they finance “soft” fixed costs, such as developing institutional capacity and human resources, as well as “hard” fixed costs, such as buildings and vehicles. Donors prefer to finance specific areas rather than provide unrestricted funding to management agencies. Development assistance to protected area management tends to come in relatively short bursts of high levels of investment, which can work against long-term strategies for conservation and sustainable use.

Land trusts

Achievement: Land trusts and other NGOs are becoming active in the establishment and management of protected areas.

In developed countries, increasing the extent of state-controlled protected areas is politically and financially difficult. In recent years a voluntary, market-driven process has emerged. Local desire to conserve particular species, habitats and landscapes or to ensure public access to them has led to the establishment of local trusts or the purchase of lands by existing state, regional or national trusts. The source of financing for these initiatives is primarily individual or corporate philanthropy. In the United States, for example, the Trust for Public Land and its partners conserved land valued at \$400 million in 2001 (Rogers and Sawyer 2001).

In developing countries, NGOs have participated in similar processes although usually with foreign financing. In the case of the Children's Eternal Rainforest in Santa Elena, Costa Rica, donations from children, particularly from Scandinavia, during the late 1980s and early 1990s helped finance the purchase of 22,000 hectares (ha) of virgin and degraded rainforest by the Monteverde Conservation League (Anon. n.d.). In another case, a carbon offset program funded by U.S. power utilities helped the Program for Belize and The Nature Conservancy purchase 5,000 ha for conservation and manage another 50,000 ha for sustainable forestry in the Rio Bravo Conservation and Management Area, leaving the remaining 50,000 ha undisturbed (UNFCCC 2001).

Challenge: NGOs and land trusts need to be innovative.

Obtaining enough funding to be able to effectively protect ecosystems is a difficult task. In developing countries, NGOs may find that the initial funds for land purchase are available but the resources for paying for ongoing management and operational costs are not. Often no provision is made for these recurrent costs, leading to a choice between cash flow problems or "paper" reserves. Indeed, the appeal of land trust donations is cast in terms of "buying" a hectare of rainforest, not managing it. In the mid-1990s, the Monteverde Conservation League faced a cash crisis in trying to managing its newly acquired lands. As noted earlier, one innovative source of funds that the league developed was a voluntary contractual arrangement with a small hydro-electric producer for the resources necessary to manage 3,000 ha in the La Esperanza watershed.

Private sector investment

Achievement: In many developing countries the private sector is responding to the ecotourism market by investing in land conservation and management.

In countries with high numbers of tourists and significant natural attractions the area under conservation has increased. The private sector is purchasing natural areas and establishing lodges and rainforest tours (e.g. in Costa Rica) and buying grazing land, restocking it with game and providing hunting or game-viewing facilities (e.g. in South Africa).

Challenge: Public agencies must work with the private sector and community groups to find ways to maximize the contribution of private protected areas to biodiversity conservation.

Privately owned protected areas are often developed for their market attraction, not their contribution to conservation. Although they may contribute to the overall conservation of ecosystems and species, this is limited by their tendency to do the following:

- conserve ecosystems that are already represented in protected areas. In Kwa Zulu Natal, South Africa, most private game farm investment occurs in the lowveld, since this habitat supports the species of most interest to tourists. The lowveld is already well conserved in provincial parks and wildlife reserves (James and Goodman 2000);

- fail to contribute to connectivity. Tourism entrepreneurs often purchase land based on location, availability and price, not biological connectivity. They also use fences to limit the movement of wildlife (i.e. in South Africa); and
- place little importance on the genetic viability of species maintained on their properties. The degrading effects of a limited gene pool on species are only discernible over time and would not usually be noticed by tourists or otherwise affect market values.

Public and non-government conservation organisations need to find ways of promoting investment in threatened and/or under-represented ecosystems/species and ensure that policy incentives encourage the maintenance of corridors between critical natural areas. For the private sector involved, conservation management may be a residual activity and the first to suffer in an economic downturn.

Section 4

Markets for environmental services

Historically, financing for protected areas — typically provided by government — has been insufficient for comprehensive management. There are many reasons for this, including the misperceptions on the part of finance ministries that protected areas require little in the way of continued funding and make only a marginal contribution to the economy. (The error of these perceptions and the progress in combating them is covered in Chapter 5. Ideas on how to better incorporate protected areas in the overall economic development planning process are reviewed in Chapter 3.) Extra resources can be generated through the marketing of services provided by protected areas and the environmental services provided by well-conserved buffer zones.

Fees for protected areas

Achievement: Park fees, particularly fees for protected area management, have increased.

Raising fees for protected areas (particularly for foreign visitors) has shown great potential for providing a sustainable flow of funding to protected areas. This only applies to areas that offer a significant nature tourism experience, however.

There is a wide range of approaches to charging visitors for access to protected areas. Some destinations, such as the Ecuador's Galapagos Islands, Virunga National Park in Rwanda (home to the last population of mountain gorillas) and parks in Tanzania and Uganda that feature chimpanzees and lowland gorillas, charge monopolistic rates (over \$100 per visit). For less well-known sites, countries either charge small amounts (in the range of one dollar or less) or do not charge at all. In countries that have differentiated their fees, charges for prime tourist destinations range from \$5 to \$30.

Since the mid-1980s Tanzania has charged foreigners over \$10 for entrance to its national parks; Kenya now differentiates by park, nationality and residence, with the top rates for foreign non-residents ranging from \$5 to \$30. Historically, fees in South Africa have not been differentiated and have been kept low. Recent reorganisation of the SA National Parks Board has brought modest increases in fees for its top destinations, such as Kruger. Kwa Zulu Natal Wildlife keeps entry fees in the \$1 range (per entry, per car) but also charges a community levy. Day visitors pay a minimal fee; guests lodging in the parks pay \$2 per night.

Fees in Malaysia and the Philippines are generally low. Malaysia does not charge higher fees for foreigners, but foreign visitors to the Tubbataha Marine Park in the Philippines must pay \$50. In Central America, fees to public protected areas are typically low and undifferentiated. Costa Rica raised its fee for foreigners from approximately \$1 to \$15 dollars in 1994 but lowered it to \$6 in 1996. Costa Rica's privately owned and

operated Monteverde Cloud Forest Preserve has covered its costs for many years and made annual contributions to a trust fund by means of a progressive, differentiated fee structure, which includes fees charged for natural history walks.

Elasticity of demand

Challenge: There is a need to move beyond pure valuation to studies designed to inform decision-making on pricing policy.

While economic valuation studies have often emphasized the average price tourists are willing to pay to enter protected areas, the more relevant measure for pricing purposes is elasticity of demand.

Typically there is an inverse relationship between tourist numbers and entrance fees; i.e. the higher the fee, the lower the numbers of people who will visit. By estimating the percentage change in quantity that will accompany a percentage change in price, economists can predict whether a given rise in price will lead to an increase or decrease in revenue (given that higher prices increase revenue but fewer visits decrease revenue). The evidence suggests that tourist demand is not highly responsive to price; prices need to be raised considerably to bring an appreciable fall in demand. In other words, raising entrance fees will raise total revenue.

This needs to be studied further. Many of the studies to date used the survey-based contingent valuation method, which tends to exaggerate values unless rigorous controls are in place. At least one study, however, examined the actual behaviour of tourists during a period of rapid price change (in Costa Rica in the mid-1990s). It showed that the gains in revenue far outweighed the drop in number of visits (Lindberg and Aylward 1999).

Allocating conservation revenues

Challenge: Charging for services provided by protected areas will lead to improved management only if institutional mechanisms are in place to ensure that the money generated is retained for use in these areas.

There are three methods of allocating conservation revenues from protected areas:

- they can be returned to state coffers;
- they can be retained for use in the area; or
- they can be used to support the protected area system.

Explicit provisions need to be made about sharing the benefits generated by protected areas. This will ensure a collaborative focus and incentive for the participants involved in raising revenues. A parastatal protected area agency – with the authority to develop and implement benefit-sharing agreements, concession arrangements, and devolution of management responsibility – provides a useful model for improving institutional incentives for revenue generation, achieving efficiencies in protected area management and ensuring overall control over biodiversity conservation.

Biological resources

Achievement: A surge in demand for access to natural biochemical and genetic structures has brought funds from pharmaceutical and other companies to protected area management.

The biochemical and genetic materials that sustain biological resources also have potential application in drug development and crop improvements, although the economic potential of bioprospecting has often been exaggerated, sometimes wildly so. A number of contractual arrangements for benefit-sharing developed in the early 1990s; they involve host-country brokers, such as Costa Rica's National Biodiversity Institute (INBio), and pharmaceutical companies, such as Merck. Deals typically provide for a fee for species samples as well as a share of future royalties.

Other, more recent partnerships have been sponsored with public money. As part of an International Cooperative Group funded by the U.S. government, the Smithsonian Tropical Research Institute screens samples of plant species in Panama. Under the agreement, Novartis, Inc. conducts tests of Panamanian extracts against its own cell lines and will undertake further research and development on promising compounds.

Challenge: There are unrealistically high expectations of royalties in biodiversity prospecting agreements, while their contributions to host country technological and scientific development are often not recognised.

Two early and much cited cases have failed to produce tangible results. The INBio-Merck screening program has been discontinued; Shaman Pharmaceuticals, Inc., which engaged in ethno-botanical screening, declared bankruptcy in the late 1990s. This notwithstanding, over the last decade INBio has contributed \$790,000 directly to project activities (such as inventory work) in conservation areas, \$710,000 to university research, and \$740,000 to programs (e.g. the bioprospecting program and the biodiversity inventory) within INBio. In addition, \$400,000 went directly to the Environment Ministry for transfer to protected area management (Laird and ten Kate in press).

The long lead time required to develop a new drug make obtaining royalty payments a risky and long-term prospect. Funding for scientific and technological development, however, can have immediate benefits for a country's development capabilities.

Markets for watershed protection

Achievement: Financial or in-kind transfers, which provide resources from downstream consumers of water services to upstream protected areas and buffer zones, are being initiated in many countries.

In some cases these transfers are significant.

Markets for watershed protection services are in their infancy. In some cases hydro-electric companies, municipal water supply utilities and irrigation users employ voluntary contractual arrangements, user fees and transfer payments to maintain or improve water quality and quantity. In Costa Rica, the La Esperanza Hydro-electric Project is paying the Monteverde Conservation League approximately \$30,000 per year to conserve 3000 ha of forest above the La Esperanza turbines (Rojas and Aylward 2002a). Other hydro-electric companies in Costa Rica are funding the management of upper watershed areas through a national scheme for payments to land-holders. This type of arrangement is the goal of the municipality of Heredia, which has instituted an ecological tariff on monthly water bills (Pagiola in press; Rojas and Aylward 2002b).

Challenge: Raising funds through watershed service charges needs to be based on a thorough knowledge of land-use and hydrology.

If this is not the case such projects risk losing credibility in the long term.

Misunderstanding and uncertainty clouds both popular and scientific knowledge of the importance of hydrological services. If consumers pay farmers for reforesting lands to raise dry season flows, only to find that they are lowered (as suggested by scientific experiments in catchment hydrology) the conservation agenda may be at risk (Bruijnzeel 2002).

Option and existence values

Achievement: Capturing option and existence values through voluntary contributions has become an important financial strategy.

Conserving biodiversity maintains the option to use species and their gene pools in the future. While there is little understanding of how significant this option value might be, it is important in driving international financing.

People are often willing to pay for the conservation of ecosystems with high biodiversity and species without ever intending to use these systems or their products in any specific way. Instead, people derive satisfaction merely from the knowledge that the system or species continues to exist. Much of the philanthropic and official assistance provided by developed countries to the developing world is motivated by these existence values.

Capturing existence values, in addition to ecotourism, is likely to be the most significant element in improving the financial sustainability of protected areas. GEF invested \$1.1 billion in biodiversity conservation in the 1990s and leveraged another \$2 billion from other donors in the process.

Challenge: Official and voluntary funds for conservation are constantly shifting.

At present their future is uncertain due to fundamental reorientations in donor spending to reflect increasing emphasis on poverty reduction and national security interests.

Section 5

Buffer zone management

A number of complementary approaches exist to ensure that economic incentives in buffer zones are consistent with successful management of protected areas and conservation of biodiversity in buffer zones. These approaches include collaborative management, benefit sharing, alternative income projects and direct payments for conservation (environmental service).

Achievement: Enabling communities in buffer zones to participate in decisions regarding protected areas and to share in the benefits they create has been widely accepted as a basic principle of protected area management.

Policies that excluded people from areas gazetted for protection have been shown to be unsustainable, particularly where those areas were used by local communities for livelihoods or for cultural and religious purposes (IIED 1994; Wells et al. 1990). Emphasis is now placed on collaborative management, benefit sharing and generating alternative income.

In Guyana, for example, the Iwokrama International Centre for Rainforest Conservation and Development has pursued collaborative management with communities in and near the Iwokrama Forest. By helping local villages form the North Rupununi Development Board, Iwokrama has established a working partnership with them and reduced threats to the sustainable use of natural resources (particularly riverine fauna), both within and outside the reserve.

Alternative income generation

Challenge: Alternative income generation, as implemented through integrated conservation and development projects (ICDPs), has often been perceived as the embodiment of this new approach, to the exclusion of other initiatives.

In the late 1990s ICDPs emerged as the standard component in the new approach to buffer zone and protected area management. A number of economists have argued that the use of direct payments for conservation is a more cost-efficient approach than relying on the alternative income generation projects contained in ICDPs (Simpson and Sedjo 1996, Ferraro and Simpson 2001, Ferraro 2001). The disadvantage

of direct payments is that they require ongoing sources of financing. Reviews have shown that the implicit assumption made of ICDPs — that short-term investments will lead to long-term relief of pressure on protected areas — may be incorrect (Wells et al. 1999).

Whether direct payments or alternative income generation are utilised, collaborative management and benefit sharing are important. Limited extraction of resources from protected areas and direct payments for conservation have proven to be important incentives for local communities to engage in collaborative management. Additional revenue generation through marketing of environmental services in or outside of protected areas (e.g. through carbon sequestration projects) will also be an incentive. Whether conservation of resource stocks and biodiversity in protected areas and buffer zones is attained through explicit contracts for conservation or through generalized benefit sharing, revenue generation can provide ongoing funds. There is a need for research, education, discussion and ultimately negotiation to arrive at successful collaborative management, revenue generation and compensation.

Section 6

Monitoring and controlling incentives

Subsidies, taxes, credit policies, price controls and other economic instruments have a long history of funding national budgets, ensuring national economic security and responding to the economic needs of political constituencies. Development and business transactions are shaped and directed by this policy context. Historically, the loss of biodiversity and natural areas has often been a result of this policy environment working against natural processes and long-term economic objectives.

In both developed and developing countries, programs of agricultural expansion that linked tenure to use of land led to deforestation and conversion of large areas. Similarly, credit for “productive” agricultural and livestock activities lowered the cost of extending the agricultural frontier. Even when policies recognised the need for conservation, initial efforts at reform often resulted in perverse outcomes. For instance, incentives offered for reforestation led land-owners to deforest their land and then apply for reforestation funds. In some cases, such as in Vietnam, this has led to forest clearing in protected areas.

Achievement: Eliminating perverse incentives that promote agricultural encroachment, alter the landscape of buffer zones and threaten protected areas is a growing priority.

In the 1980s and 1990s conservationists and economists stressed the need to eliminate price and credit subsidies promoting land uses that were incompatible with retention of primary habitat and indigenous biodiversity. At the same time, pressure on government budgets and lowering barriers to international trade exerted downward pressure on subsidies in general. Some of the more perverse subsidies have been either reduced or removed.

Challenge: Dismantling policy instruments is a long process, and new threats will continue to emerge.

Policy and incentives are in a constant state of renewal, due to changes in thinking and in governments. Special interests lie in wait to exploit such opportunities. Constant scrutiny of government programs is required to prevent perverse incentives from being established.

Section 7

Conclusions

In the past decade, budgets for protected areas — never generous in the best of times — came under increasing pressure. Governments undertook fiscal austerity programs and attempted to offload responsibilities onto the private sector. At the same time, increased international recognition of the importance of natural systems and biodiversity led to increased development assistance for conservation. Fiscal austerity did have some benefits; it brought an increased understanding of the perversity of some fiscal incentives and of the need to recognise the development benefits of conservation. More recently, efforts to recover the costs of managing protected areas have increased, principally through the marketing of the goods, services and attributes provided by these areas.

The achievements and challenges mentioned in this paper highlight the primary opportunity for protected area management: to capitalize on the expanded notion of who benefits from protected areas and buffer zones. New approaches to marketing the environmental services provided by natural ecosystems and to the use of conservation payments have developed. They provide a significant opportunity to increase revenues and to use conservation resources more efficiently. More revenue and greater efficiency are not the solution for all the difficulties faced by protected areas, but they do provide new opportunities, particularly when combined with progressive efforts at collaborative management, internal policy reform to improve institutional incentives, and continued attention to perverse incentives and the value of protected areas in national economic planning.

Experience with economic valuation and marketing efforts suggests that protected areas in developing countries must expand their ability to capture the global value of biodiversity. Establishing, raising and differentiating entrance fees will be critically important, as will drawing on the willingness of developed countries to pay for the preservation of tropical ecosystems and their biodiversity through official channels and donations. Capitalizing on carbon sequestration services for conservation appears to be limited, since land-use sinks are excluded from the Clean Development Mechanism under the Kyoto Protocol. These systems can still be important in the recuperation of ecosystems, however, particularly in buffer zones. The marketing of hydrological services is in the experimental stage, bogged down by difficulties in establishing the value of these services. It nonetheless shows promise as a means of transferring resources at the microscale, particularly where private or parastatal entities are engaged in water supply, irrigation and hydro-electric development.

Section 8

References and selected reading

Anon. n.d. *Bosque Eterno de los Niños*. Eco-Index. Available from <http://www.eco-index.org/search/resultss.cfm?ProjectID=216>.

Bruijnzeel, L.A. 2002. "Tropical forests and environmental services: not seeing the soil for the trees?" *Agriculture, Ecology and Environment*.

Emerton, L. 2002. *The Use of Economic Valuation for Protected Area Management in the Lower Mekong: A Review of Experiences and Lessons Learned*. Economic Lessons Paper for the Critical Review of Protected Areas in the Lower Mekong. Karachi: IUCN.

Ferraro, P.J. 2001. "Global Habitat Protection: Limitations of Development Interventions and a Role for Conservation Performance Payments." *Conservation Biology* 15 (4): 1–12.

- Ferraro, P.J., and Simpson, R.D. 2001. *The Cost-Effectiveness of Conservation Payments. Resources for the Future*. Discussion Paper No.00-31. Washington, D.C: Resources for the Future.
- IIED. 1994. *Whose Eden? An Overview of Community Approaches to Wildlife Management*. A Report to the Overseas Development Administration. London: International Institute for Environment and Development.
- James, B.M., and Goodman, P.S. 2000. *Ecological Study. Report to the World Bank Research Project on Nature Tourism and Conservation*. Cascades, KwaZulu Natal: Brousse-James and Associates and KZN Wildlife.
- James, D. 2002. *Integration of Protected Areas in Economic Development Planning. Economic Lessons Paper for the Critical Review of Protected Areas in the Lower Mekong*. Sydney: Ecoservices, Ltd.
- Knowler, D. 1999. *Incentive Systems for Natural Resource Management: The Role of Indirect Incentives*. Environmental Report Series No. 2. Rome: FAO.
- Laird, S.A., and ten Kate, K. (In press). Biodiversity Prospecting and Forest Conservation: Has it lived up to its Promise? In S. Pagiola, J. Bishop and N. Landell-Mills (eds.). *Selling Forest Environmental Services: Market-based Mechanisms for Conservation*.
- Lindberg, K., and Aylward, B. 1999. "Price Responsiveness in the Developing Country Nature Tourism Context: Review and Costa Rican Case Study." *Journal of Leisure Research* 31 (3): 281-299.
- Ostrom, E., Schroeder, L. and Wynne, S. 1993. Institutional Incentives and Sustainable Development: Infrastructure Policies in Perspective. In P.A. Sabatier (ed.). *Theoretical Lenses on Public Policy*. Boulder: Westview Press, Inc.
- Pagiola, S. (In press). Paying for Water Services in Central America: Learning from Costa Rica. In S. Pagiola, J. Bishop and N. Landell-Mills (eds.). *Selling Forest Environmental Services: Market-based Mechanisms for Conservation*.
- Rogers, W., and Sawyer, C.G. 2001. "Taking Land Conservation out of the 'Emergency Room'." *Land & People* 13 (2).
- Rojas, M. and Aylward, B. 2002a. *Cooperation between a Small Private Hydropower Producer and a Conservation NGO for Forest Protection: The Case of La Esperanza, Costa Rica. Land-Water Linkages in Rural Watersheds*. Case Study Series. Rome: FAO.
- Rojas, M., and Aylward, B. 2002b. *What are We Learning from Experiences with Markets for Environmental Services in Costa Rica? A Review and Critique of the Literature*. A Report for the International Institute for Environment and Development.
- Simpson, D.R., and Sedjo, R.A. 1996. "Paying for the Conservation of Endangered Ecosystems: A Comparison of Direct and Indirect Approaches." *Environment and Development Economics* 1 (2): 241-257.
- UNFCCC. 2001. Activities Implemented Jointly: Rio Bravo Carbon Sequestration Project. United Nations Framework Convention on Climate Change. Available from <http://www.unfccc.int/program/aij/aijact98/blzusa01-98.html>
- Wells, M., Brandon, K., and Hannah, L. 1990. *People and Parks: Linking Protected Area Management with Local Communities*. World Bank. Washington, D.C.
- Wells, M., Guggenheim, S., Khan, A., Wardojo, W., and Jepson, P. 1999. *Investing in Biodiversity: A Review of Indonesia's Integrated Conservation and Development Projects. Directions in Development Series*. Washington, D.C: World Bank.