

MAKING BIODIVERSITY CONSERVATION A LAND USE PRIORITY¹

Agi Kiss, Ph.D.

Environment and Biodiversity Lead Specialist
The World Bank
Africa Environment and Social Development Unit²

INTRODUCTION

Since 1990, the World Bank has supported 226 conservation-related projects around the world, involving over \$1 billion of IBRD/IDA¹ resources and \$450 million of GEFⁱⁱ funds, as well as an additional \$1.2 billion in co-funding from other national and multilateral donors, governments, NGOs, foundations and private companies. More broadly, Conservation International estimates that the international community (governments, multilateral development banks and conservation groups) spends at least half a billion dollars each year on conserving biodiversity in the tropics (Hardner and Rice 2002). Satchell (2000) reported that about \$4 billion has been spent on conservation over the past decade, while a recent report from the Organization for Economic Cooperation and Development (OECD 2000) estimated that in 1998, \$778 million of bilateral Official Development Assistance (ODA) in sectors such as agriculture, forestry, water and general environmental protection sectors had a biodiversity focus.

Despite this high level of investment and effort we (the conservation community collectively) can only point to some individual, localized successes, but taken as a whole we have had little impact on stemming or even slowing the rising tide of biodiversity loss.

This raises the urgent question of whether our prevailing models are faulty, or whether the problem lies in the way they are being implemented. This chapter argues that both are true, particularly when it comes to conserving biodiversity outside PAs. Conventional conservation projects, including the integrated conservation and development projects (ICDPs) which are the subject of this volume, have failed to address the true causes of biodiversity loss at the scale on which they operate. We have also focused too much on carrying out project activities and too little on creating incentives for conservation. Achieving better results in the future will require new approaches that respond to the need to encourage and reward landholders for achieving conservation outcomes.

WHO CONTROLS BIODIVERSITY?

¹ In Press (Columbia University Press)

² MSN J-6-604, 1818 H Street, NW, Washington, DC 20433

The majority of the world's remaining biodiversity is found in tropical, developing countries, while the great majority of biodiversity supporters are from industrialized countries. Governments and citizens of developing will determine whether the biodiversity found on the land that they own, occupy or control will be preserved or lost. Donors and international conservation organizations that support biodiversity conservation around the world are largely "external stakeholders," who try to influence the decisions and actions of the internal stakeholders, mainly by providing money and information.

Like most people, landholders and resource users in developing countries make their decisions based mainly on their perceived self-interest, with a strong bias towards the short term. Unfortunately, the benefits of conserving biodiversity tend to be long-term, indirect and diffuse, while the benefits of activities that destroy or degrade biodiversity tend to be short-term, direct and easily captured by individuals. Most people do not routinely sacrifice short-term, personal gains in order to achieve long-term benefits for a wider community, regardless of whether they are living on the edge of survival or directing commercial enterprises. For example, Jensen et al. (1990) noted that California timber companies practicing sustainable management were ripe for takeover by companies intending to extract resources quickly. In the case of ICDPs, communities often become impatient waiting for benefits from enterprises such as ecotourism to materialize. To retain their interest and goodwill, projects typically provide short-term social benefits (schools, water supply, etc.) that are not directly linked to conservation actions or results. As a result the original objectives of the project are deferred and often forgotten.

It has become popular to say that factors such as poverty and over-population are the "root causes" of biodiversity loss, which must be addressed if conservation is to be sustainable. But it is also overly simplistic: many species of domestic plants and animals are consumed by the same growing human population, continue to grow in numbers and expand their range with human assistance. Rather than poverty or human population growth *per se*, the fundamental cause of biodiversity loss worldwide is that those in a position to preserve it lack sufficient incentives to do so.

TARGETING THE MAIN CAUSES OF BIODIVERSITY LOSS

Loss of natural habitats-- as a result of conversion to agriculture or other uses-- is the single greatest source of biodiversity decline and loss world-wide. Hardner and Rice (2002) determined that destruction of natural habitat over the past several decades has been driven mainly by logging for timber (followed by settlement), and by expanding production of beef, soybeans, palm oil, coffee and cocoa. These pressures are increasing rather than decreasing around the world, and are not likely to diminish in the foreseeable future.

Therefore, the top priority for conservation investment must be to slow, halt, and even reverse this process of habitat loss in areas that are recognized as the most important sites for conservation (given that it is clearly not possible to do so everywhere that biodiversity is being lost). The key question therefore is: how can we encourage those who make the land use decisionsⁱⁱⁱ in these areas to forego the benefits associated with destructive activities in favor of conserving biodiversity?

In some areas, other sources of biodiversity loss, such as over-harvesting harvesting of economically valuable plant and animal species, may be more important than habitat conversion. It is estimated that people in central Africa consume the equivalent of 4 million head of cattle in bushmeat each year (Bennet et al. 2002), and that in the Congo Basin alone, 25 million people consume over 1 million metric tons of “bushmeat” (Satchell 2000). Beyond the local level, there are huge international markets for tropical biological products such as bushmeat, timber and fish. Invasion by alien species is another very significant cause of biodiversity loss in some areas, particularly on islands and in locations where the native vegetation is highly specialized and vulnerable to colonizers. For example in South Africa it is estimated that one quarter of the native plant species are directly threatened by invasive alien plants, many of which were intentionally introduced^{iv}.

Regardless of whether we focus on habitat loss, over-exploitation or alien invasions, the key question is how well our responses match the nature and scale of the problem. In particular, we must recognize that the forces behind biodiversity loss operate on a large geographic scale and involve the actions of huge numbers of people, and that local communities are sometimes the direct consumers, sometimes only acting as agents for distant buyers, and sometimes not involved at all.

CONSERVATION APPROACHES: EXPERIENCE TO DATE

“Protection” vs. “Participation”

Should biodiversity protected *from* local communities, or *by* them? Protectionism (derogatorily named “fortress conservation” by some practitioners, particularly from southern Africa) includes exclusive Protected Areas (PAs), hunting bans and regulations prohibiting trade in wildlife products. The participation approach is based on encouraging people to accept or welcome the presence of biodiversity by utilizing it in some fashion. It may involve private landowners but usually targets poor, rural communities who live in biodiversity-rich areas, often adjacent to PAs. The two approaches may be seen as alternatives, but can also be complementary, as in the case of a PA surrounded by a buffer area that is managed on CBC principles.

A detailed discussion of the pros and cons, strengths and weaknesses of these approaches is beyond the scope of this paper. Each has succeeded to some extent but both must generally be considered to be failing overall. As currently practiced, neither is likely to result in preservation of a substantial part of the world’s biodiversity over the long term. With regard to PAs, the problem is that, although they can be successful in a narrow sense (see Bruner et al. 2001), they are on the whole too few, too small and too threatened to be relied upon as the sole instrument for conserving biodiversity.

This paper focuses on conservation outside PAs. Despite the popularity of ICDPs and other CBC models, there is increasing evidence and growing acknowledgement that this approach is in most cases failing to achieve either conservation or lasting development benefits (e.g., see Kellert et al. 2001; Newmark and Hough 2000; Wells et al. 1999; Oates 1999; Brandon et al. 1998; and many

others). Roe et al. (2000) summarized the conclusions from thirty years of experimentation as follows:

- CBC can work as a conservation approach, but only under a set of conditions which are rarely found in reality;
- in the absence of these circumstances CBC is likely to fail, sometimes dramatically; and
- CBC can complement enforcement by improving communities' attitude and reducing pressure, but can't replace enforcement

“Project” vs. “Non-project” approaches -- in theory....:

In a “project approach” to conservation funding, an organization or group of people is given financial and other assistance to help them carry out a specified set of activities which are expected to result in preservation of a particular segment or facet of biodiversity (often not well defined). By contrast, in a “non-project” approach, the donor provides financial and other inputs to encourage and enable the beneficiaries to achieve specified goals, without necessarily specifying how they should do so. These goals may include maintaining a given area in a pristine natural condition, increasing or maintaining viable populations of particular species, reducing key pressures such as hunting levels or encroachment of PA boundaries, or any other direct conservation objective.

The project approach is limited by the fact that biodiversity loss generally results from the actions of many people across wide areas over long periods of time, while projects by their nature target relatively small numbers of people in a relatively small area over a limited period of time^v. Kiss (1999) detailed this and other shortcomings of the project approach, such as a focus on activities rather than results, the tendency to establish a perverse “donor-recipient” mentality that promotes dependency rather than self-sufficiency, and the “magnet effect” which undermines conservation objectives by attracting more people to the project area. Most importantly, while a project might help people accomplish something they are already motivated to do, it is not likely to be an effective mechanism for creating the motivation to begin with.

Non-project approaches such as tax incentives, targeted subsidies, access to specialized niche markets and so on, are better suited to creating motivation. They can also stimulate innovation and ingenuity as people solutions that yield the same reward for less effort and investment, and they can reach and influence the actions of large numbers of people across wide areas. The challenges of non-project approaches include the need to design incentive systems correctly to ensure that they do not have perverse impacts and cannot easily be exploited by “cheaters” or “free riders,” and setting and monitoring indicators and targets.

...and in practice:

While the focus of this chapter is on conservation outside PAs, it is worth noting that most support for strengthening PA management has been provided through the project model, with the associated short time frames and a focus on implementing park management plans and annual work programs. The result has often been a “boom and bust cycle,” in which staff increases and large capital are made while the project is in place, but cannot be maintained when the project closes. “Non-project” alternatives include endowing Trust Funds to provide a modest but reliable funding over the long term, and providing unprogrammed budgetary support based on the achievement of specific conservation results and impacts. Neither approach is common, but there are now a small number of Trust Funds supporting specific PAs or PA systems around the world.

In developing countries, conservation outside PAs has also been supported mainly through project vehicles, and has suffered from the constraints, limitations and perverse effects discussed above. In addition, the real divergences and conflicts between the objectives of the donors and the beneficiaries are often glossed over in the rush to begin implementation. In ICDPs in particular, conservation and development objectives are assumed –often with little evidence-- to be compatible or even synergistic. Later, the project team becomes preoccupied with ensuring that project activities are implemented and funds are accounted for, while recipients focus on getting benefits from the project. The conservation objectives get lost, as can be seen by how few projects actually monitor or evaluate their biodiversity impacts.

In industrialized countries, by contrast, conservation is mainly supported through non-project approaches such as land purchasing, easements and subsidies. These instruments focus on creating incentives and rewarding results, rather than on defining and implementing activities. This paper makes a case for greater use of similar “non-project” approaches in developing countries and provides examples of how it is already being done.

Emphasizing non-project vehicles does not mean abandoning project-based assistance altogether. Inadequate information, poorly defined property rights, a lack of organization or management capacity and other factors can impede landholders from responding even when appropriate incentives are in place. Project-based assistance can complement non-project approaches by helping to overcome these obstacles. In the absence of appropriate incentives, however, this type of support will have little benefit and may even cause harm. For example, with the wrong incentives in place, devolving ownership or control over wildlife or forests from government to communities (or to private landowners or private companies) can trigger even more rapid decline by removing the last barriers to exploiting the resource for short-term, individual profit or survival.

MAKING BIODIVERSITY A LAND USE PRIORITY

As external stakeholders we can help to make biodiversity a land use priority in two ways: by helping to acquire or secure land specifically for conservation purposes, and by helping to make conservation an economically competitive land use from the perspective of existing landholders, through economic and other incentives.

The remainder of this paper examines these approaches, the types of incentives they create, and the conditions under which they are likely to cost-effective and sustainable.

Acquiring Land for Conservation

An estimated 4-10% of the world's land area lies within official PAs such as national parks and wildlife or forest reserves. Even when these PAs have been established for other purposes such as watershed protection or recreation, they help protect biodiversity by restricting the conversion of natural habitat to other uses.

In many parts of the world individuals, groups and corporations have established various types of private PAs (see Langholz 1999). For example, Colombia has a well-organized network of over 100 private reserves, and similar networks are found in Costa Rica, Brazil, Guatemala, Brazil and Australia among others. South Africa's natural Heritage Program, a cooperative venture between government, private landowners and the business sector, has registered over 150 sites protecting more than 215,332 hectares, over 100 of them privately owned. In southern Africa groups of ranchers have been combining their holdings into formally established conservancies to create large areas of wildlife habitat with the objective of generating income through tourism or sport hunting.

Conservation groups may buy land outright to establish or add to PAs, or they may they secure land for conservation without taking ownership, by acquiring certain use and development rights through conservation leases or easements. Land purchase, leasing and easements are the principle tools employed by some of the largest conservation organizations operating in developed countries, including The Nature Conservancy, the Conservation Fund, the U.K. National Trust and the Royal Society for the Protection of Birds. In the U.S. alone, The Nature Conservancy has a system of more than 1300 reserves protecting over half a million hectares, comprising the largest private natural reserve system in the world (Murray 1995). The Nature Conservancy also acquires land and transfers it to local or national government conservation agencies. The Revolving Fund for Nature, administered by the Trust for Nature (Victoria, Australia), purchases lands of conservation significance, places a binding covenant on them specifying permitted and prohibited activities to ensure that they are used for conservation in the future, and then resells them. In what amounts to an "involuntary easement," under the U.S. Endangered Species Act (ESA) the U.S. government can preempt a private landowner's rights to develop his land by declaring it to be critical habitat under a species recovery plan (see Innes et al. 1998).

Biodiversity conservation can also be a "side benefit" when land is secured for other purposes, such as maintaining watersheds. The government of New York City recently invested about \$2 billion to buy land and easements to protect the Catskills watershed, thereby avoiding the need to pay about \$9 billion to build and operate a water treatment plant (Chichilnsky and Heal 1998). Municipal authorities in Cuenca, Ecuador, also used part of their water revenues to buy out land users in sensitive parts of the watershed and place the land under conservation.

Land acquisition and easements for biodiversity conservation are much less common in developing countries, probably for the reasons discussed in the final section of this paper. Nevertheless, there are some examples and conservation

organizations are increasingly experimenting with this approach (see Box 1). For example, Conservation International's Global Conservation Fund was set up to finance conservation land deals in developing countries.

Box 1: Examples of Land Acquisition for Biodiversity Conservation in Developing Countries

Costa Rica: Under the **Forest Conservation and Management Through Local Institutions (BOSCOSA) Project**, a forest conservation and management incentive fund (PROINFOR) gives landowners about US\$700 per hectare for putting land under conservation easement. The easement is initially for five years and may be extended for three more. Funds are paid into interest-generating accounts or bonds. (Donovan 1992; Cabarle et al. 1992).

Costa Rica: The **Monteverde Conservation League (MCL)** was created in 1986, to purchase forest land surrounding the Monteverde Cloud Forest Reserve for conservation purposes. MCL now owns over 22,000 hectares, including the **Children's Eternal Rain Forest**, which was bought with contributions from European school children and is now the largest private preserve in Costa Rica (Rojas and Aylward 2001).

Philippines: An island off the coast of western Negros was purchased in 1997 by the Philippines Reef and Rainforest Conservation Foundation Inc., with the help of a loan from the World Land Trust.

Tanzania: An NGO, **The Land Conservation Trust**, recently acquired title to the Manyara Ranch adjacent to Lake Manyara National Park. The area will be managed by TLCT in way that provides for use and benefits to the community while maintaining critical wildlife corridors.

Kenya: **The Wildlife Trust** and the Friends of Nairobi National Park are using "Wildlife Conservation Leases" negotiated with local Maasai landowners to maintain vital wildlife migration corridors south of the Park. For the going rate of \$4 per acre (an average family has 100-200 acres), the landowners agree not to fence, cultivate or sell the land for the period of the lease (currently on a year-to-year basis).

South Africa: The South Africa National Parks makes contractual arrangements with private, communal or municipal landowners to incorporate their land into national parks. Examples include the Richtersveld National Park (a 100% contractual park), the Cape Peninsula National Park and the Agulhas National Park.

Guyana: The Global Conservation Fund (Conservation International) has leased rights to 200,000 acres and established an endowment fund to cover royalties, management fees and economic development activities for local communities (e.g. education, job training).

Making Biodiversity a Competitive Land Use

Economic Incentives

The essence of the strategy for conservation outside PAs is to make biodiversity conservation competitive form of land use in areas where we would most like to see it preserved. To do this it must generate net income (and/or valuable products and services) equal to or greater than alternative land uses. Hulme and Murphree (1999) call the use of market-based approaches “the new conservation.” There is, however, a difference between establishing a *market for biodiversity* and *marketing biological products*, which may or may not be compatible with conservation. Markets (in land, timber, fish, bushmeat, ivory, etc.) have generally been the downfall, not the salvation of biodiversity. Is it possible for a market-based approach to result in conservation rather than destruction? The answer lies in the types of incentives that various market-based models create for landholders and resource users. These models may be placed on a continuum with respect to how directly the commodity being marketed is linked to the objective of conserving biodiversity:

(LEAST DIRECT)

Utilization through extraction and marketing of biological products



Utilization through marketing of biodiversity within relatively intact natural ecosystems



Subsidies or other compensation for adopting reduced-impact land uses



Direct payment for environmental services other than biodiversity conservation (yielding conservation as a “side benefit”)



Direct payment for the service of maintaining natural habitat and/or conserving biodiversity

(MOST DIRECT)

The pros and cons of these different approaches are discussed below. While most biodiversity projects in developing countries (including ICDPs) emphasize the “indirect” end of the range, approaches at the “direct” end of the range are more likely to be successful and efficient in many cases.

(1) Utilization through extraction and marketing of biological products

There is no doubt that biodiversity products can be very valuable. Huge industries have been built around harvesting of tropical hardwoods, fishing, and

hunting for food or sport. On a smaller scale, many animal and plant species are harvested for medicinal or other uses (e.g. Rosy Periwinkle as a source of leukemia medicine; *Prunus africanus* for prostate treatment, rhinoceros horn for many uses in oriental medicine, etc.). But commercial success usually leads to over-harvesting of the source species, particularly when there is a regional or global market. The overriding incentive for those who have access to wild growing products is to exploit them as much and as quickly as possible, before someone else does the same.

Advocates of “sustainable use” as a conservation tool seek to create incentives for users to forego short term “mining” of renewable resources in favor of managing them for long term gains. Providing security and exclusivity of access is usually regarded as necessary but is certainly not sufficient. For example, Wunder (2001) found that in the highlands of Ecuador greater security of land tenure actually increased deforestation rates because farmers were more likely to be able to capture the long-term economic benefits associated with logging, followed by cultivation and then conversion to pasture. While many programs or producers claim to practice “sustainable use,” there are few clear demonstrations of truly sustainable commercial harvesting of non-cultivated living organisms over any substantial period of time. In fact, many critics of the “sustainable use” concept hold that consumptive use of wild populations of plants or animals is not and cannot be sustainable, but inevitably leads to decline and loss of species and ecosystems, regardless of whether ownership or control is in the hands of government, communities, individuals or corporations (e.g. see Bennett and Robinson 2000; Redford and Richter 1999; Alvard et al. 1997; Kramer et al. 1997; Barrett and Arcese 1995; Robinson and Redford 1994a,b; Redford 1992; and many others).

Extractive use of biological products may sometimes contribute to biodiversity conservation if it provides the only viable alternative to land transformation. On Hawaii, artifacts made of *Acacia koa* wood sell for thousands of dollars, leading some landowners to allow land previously converted to sugarcane or pasture to return to natural *A. koa* woodland to tap this lucrative market^{VI}. In this case relatively wealthy landowners are choosing between alternative sources of cash income. By contrast, in a comprehensive analysis of the CAMPFIRE program in Zimbabwe, Murombedzi (1999) found that the substantial income that community landholders derived from trophy hunting fees did not lead them to maintain wildlife habitat. Instead, they usually invested the income in expanding agriculture into the wildlife areas. In this case the incentive of income from wildlife is apparently not sufficient to overcome the bias towards farming as the primary source of livelihood.

(2) Utilization of biodiversity within relatively intact natural ecosystems

While still focusing on “products” of biodiversity rather than the biodiversity itself, economic utilization of biodiversity *in situ* is in principle less likely to result in over-exploitation of individual species than extractive approaches. If successful they can provide incentives for maintaining relatively intact natural ecosystems.

“Ecotourism” is a popular “alternative income” approach because it is seen as environmentally benign and potentially very lucrative, and “entry barriers” are

perceived to be low. The reality can be quite different. For low environmental impact and high socio-economic reward, tourist numbers and infrastructure development must be kept low and per-tourist expenditures must be high. The pool of clients willing to pay more for less comfort and convenience is limited. Entry barriers are also higher than prospective ecotourism entrepreneurs may perceive because they fail to take into account costs such as provisioning, insurance, marketing and training. Unfortunately, community-based ecotourism enterprises often fail, or earn only low and unreliable revenues from budget travelers passing through.

Aside from these considerations, ecotourism and biodiversity are not always synergistic. Many sites of high biodiversity richness are poor tourism because they are remote, dangerous, very uncomfortable, or lack charismatic fauna and flora. Many so-called ecotourism operations also modify the natural habitat, for example by constructing water holes, burning vegetation, diverting natural streams, etc.. The biodiversity impacts of these modifications may be more significant than it seems: for example, constant observation can disrupt the feeding or breeding behavior of some species, and it has been found that the creation of artificial watering holes increases local densities of some plant and animal species at the expense of others.

Sport hunting is a form of tourism because the real value lies in the experience, not in the meat or skin. It can generate considerable profits from areas which offer poor prospects for other uses, including photo-tourism, and the population impact of well-managed sport hunting can be small because only a few animals (often males). Unfortunately, good management has proven to be very hard to achieve, largely because of the high potential for “rent seeking” on the part of regulating officials.

“Bio-prospecting” is seen as biodiversity-friendly because it is the genetic information, rather than the organisms themselves, that are being exploited for profit. However, little money has been generated through bio-prospecting to date and the level is likely to remain low due to the high level of risk and the limited pool of investors. Also, in the landmark 1991 bio-prospecting deal between the Merck Pharmaceutical Company and the Institute of Biodiversity in Costa Rica, only 10% of the \$1 million up-front payment and 50% of any royalties from commercially successful products were earmarked for conservation purposes, mainly for biological inventories and training rather than forest protection (Heal 2000).

(3) Subsidies and other compensation for biodiversity-friendly land uses

Subsidies can help to close the gap between private and public interests by encouraging individuals voluntarily to take actions that benefit society but involve costs to themselves. Many governments and other organizations provide subsidies to encourage landowners to adopt environmentally friendlier land use practices. Examples include the European Union’s the umbrella “agri-environmental subsidies,” the Tyr Cwmen system to subsidize conservation of heathlands in South Wales and the U.S. Department of Agriculture’s Wildlife Habitat Incentives Program (WHIP) and the Sustainable Agriculture Research and Education (SARE) Program which subsidize habitat protection and soil restoration. The scale of such subsidies is enormous. Overall, between 1993-1997, 14 European nations spent an estimated \$11 billion for

long-term set-asides and forestry contracts covering over 20 million hectares. In the U.S., the Conservation Reserve Program spends about \$1.5 billion annually to contract for 12-15 million hectares and at about \$8 billion per year conservation-related subsidies are the third largest agricultural subsidy program (following wheat and corn). According to OECD reports, conservation contracting programs are among the fastest growing payments to farmers in high-income countries around the world (Ferraro and Simpson 2000; OECD, 1997).

Conservation land use subsidies are much less common in developing countries, but there are some emerging examples, usually funded by external donors and therefore usually serving both local and “global” interests. For example, the IDA/GEF-financed El Salvador Environment Project (under preparation) aims to subsidize land users to adopt practices that will generate local and nation benefits such as flood protection, and also regional/global biodiversity benefits by creating corridors connecting protected areas to one another and to the Meso-American Biodiversity Corridor.

Because truly sustainable use of biodiversity is rarely a competitive land use on its own, many conservationists promote “multiple use” by subsidizing (e.g. through free or cheap inputs or technical assistance) commercial land uses that are relatively compatible with maintaining biodiversity assets. Common examples include mixed livestock and game ranching, agro-forestry, and various forms of “conservation farming.” These uses inevitably result in some alteration of the natural ecosystem and biological communities in the area, but they can represent very viable options in those areas that are not of sufficient biodiversity priority to justify the costs of full protection.

Markets for “green certified” products such as organic produce, sustainably harvested timber and shade coffee also represent a form of subsidy, in this case from consumers who are willing to pay a premium price for products produced in particular ways. Again, biodiversity can benefit even where conservation is not the main objective. An example is organic produce, which is mainly driven by health considerations but also benefits biodiversity by reducing the use of pesticides and fertilizers. The main constraint to this approach is the extent to which consumers are willing to pay the premiums (or, as in the case of the various types of “conscience coffees,” which of several alternative environmental or social public goods they prefer to subsidize).

(4) Direct payment for environmental services (biodiversity conservation as a side-benefit)

In this model, “consumers” of environmental services are taxed or contribute voluntarily to generate funds to help maintain those services. Probably the best known developing country example is the Environmental Services Payment Program in Costa Rica, which pays landowners in key watershed areas to maintain forest or reforest degraded slopes. The current rate is \$40/hectare, based on delivery of four services: mitigation of greenhouse gas emissions, watershed protection, biodiversity protection and natural scenic beauty. Part of the funding comes from hydro-electric plants and other water-using enterprises. Another case from Costa Rica involves a

private contract between the La Esperanza Hydropower Project and the Monteverde Conservation League (MCL), which owns most of the 3000 hectare watershed for the hydropower project. The hydropower project is paying \$10/ha for the watershed service, as a means of assisting the MCL to protect the forest effectively (see Rojas and Aylward 2001).

An exciting recent development is the emerging global market for carbon emissions reductions units under the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC). This “carbon trading” follows the successful model of sulfur dioxide emissions trading launched in the U.S. in 1990. One global energy broker (Natsource) has estimated that 55 million tons of greenhouse gases have been traded since 1996, and that the market could expand to \$200 billion in next few years (Foroohar 2001). The linkage with biodiversity comes mainly through trading in “Reduction Units,” for removing carbon from the atmosphere by sequestering it in the form of long-lived organic matter such as trees or soil reservoirs. When coupled with restoration or protection of natural habitats, payment for the service of carbon sequestration can yield biodiversity benefits. Ongoing projects involving developing countries include:

- ❖ the Costa Rica Environmental Services Program described above, in which a consortium of Norwegian power producers has paid \$ 2 million for 200,000 tons of certified tradeable carbon offsets;
- ❖ the Belize *Rio Bravo Carbon Sequestration Project* (implemented by the Program for Belize and the Nature Conservancy) in which corporate investors obtained carbon credits for purchasing approximately 6,014 hectares of endangered forest that were slated to be converted to mechanized agriculture;
- ❖ a deal brokered by The Nature Conservancy, in which General Motors will provide \$10 million to restore a Brazilian rainforest devastated by water buffalo ranching in exchange for credits for the carbon dioxide that the new forest will absorb over 40 years; and
- ❖ a deal in which the London-based Sustainable Forestry Management gave two Native American tribes in Montana \$50,000 to reforest 250 acres devastated by fire in 1994, in exchange for the rights to the estimated 47,972 tons of CO₂ the trees are expected to absorb over the next 80 years. Based on current estimates this investment could earn over \$3 million (or nothing, if the project fails).

The World Bank is also a major player in this arena. In April, 2000 the Bank helped launch global carbon offset trading through the Prototype Carbon Fund (PCF), which mainly focused on carbon emissions by power producers and industry. It is now in the process of launching a new “Biocarbon Fund” and a “Community Development Carbon Fund,” which aim to link carbon offsets with biodiversity conservation impacts and community level economic development benefits.

(5) Direct payment for the service of maintaining natural habitat and/or conserving biodiversity

In this final, most direct model, biodiversity is not a side benefit but the main objective. Like the watershed services and carbon offset markets, it is based on the

premise that there are willing “buyers” of the biodiversity conservation service. The approach is far from common but there are some examples, both from industrialized and developing countries (Boxes 2 and 3). The former mainly target private land owners and endangered species, while the latter emphasize communities and habitats, demonstrating how the direct payment approach can be applied to CBC.

A growing area of direct payment is “conservation concessions,” in which conservation organizations bid against logging companies to win logging concessions and take them off the market. Examples include several “conservation deals” (e.g. in Guyana and Peru) financed through Conservation International’s (CI) Global Conservation Fund (GCF). A World Bank-financed forest conservation project under preparation in Papua New Guinea will include establishment of a Conservation Trust Fund to pay communities (the legal owners of indigenous forests in PNG) to forego giving out logging concessions (see Seymour and Dubash 2000). The fact that logging concessions are relatively inexpensive in many parts of the world makes this a potentially viable instrument for large scale application. For example, in the Guyana case, CI leased a 200,000 acre tract of forest for an application fee of \$20,000 and an initial rate of fifteen cents an acre annually (see Wilson 2002). However conservation bidders may need to cover not only the direct value of the timber concession, but also opportunity costs such as taxes and employment that the logging alternative would provide. There can also be legal obstacles, as national law may, for example, require that concessionaires actually carry out logging or risk losing the concession rights. This was the case in the GCF initiative in Peru, but was resolved when the Government passed a new forestry law that provided for “conservation concessions.”

Box 2 Direct Payment to Landowners for Conservation of Threatened and Endangered Species

“Commodity Trading” of the Red Cockaded Woodpecker in the U.S.: The red cockaded woodpecker is listed under the U.S. Endangered Species Act (ESA), which mandates the development and implementation of a “species recovery plan” including obligatory preservation of critical habitat on private land. The species nests in forests owned by the International Paper Company among a few other sites. Under an arrangement with the U.S. Fish and Wildlife Service, IPC is regarded as having met its obligation if it maintains a minimum number of breeding pairs in each area. Any pairs in excess of this number can be “banked,” i.e. used by the company to offset ESA requirements on its other holdings, or even “sold” to other landowners to offset their requirements. Through this mechanism, breeding pairs of the woodpeckers have become a valuable commodity, giving the company an incentive to maintain more than the minimum target number. Recent press reports suggest that International Paper has been able to sell the banked “titles” for as much as \$200,000 per breeding pair (see Heal 2000).

Increasing Populations of Grassland Birds in the Netherlands: Intensive farming practices in the Netherlands threaten many species of indigenous grasslands birds. Farmers in certain crucial environmentally sensitive breeding

areas receive financial compensation for using less intensive forms of agriculture which favors the birds but reduces crop production. This approach has been difficult to monitor and enforce and has bred conflict between conservationists and farmers. In recent experiments, some farmers have been paid instead for producing clutches of certain species (higher amounts for the rarest species). This “results-oriented” approach is proving successful (yielding significantly higher hatching success), easier to monitor, and less expensive (about \$40 equivalent per clutch compared with \$100-400 per clutch with the approach of compensation for income losses). In this approach, biodiversity becomes one product that farmers choose to produce on the farm (see details in Muster et al. 2001).

Box 3. Direct Payment to Communities for Biodiversity Conservation Services in Developing Countries

In India, the National Forestry Policy calls for communities to participate in protecting and rehabilitating forests. Under the World Bank-financed Madhya Pradesh Forestry Project, village committees in MP state are signing Memoranda of Understanding with the Forest Department (MPFD), which allocate a specific area to that community (up to 300 hectares). In addition to the conventional provisions authorizing specified forest uses, these MOUs provide for payment to communities for carrying out specified forest protection activities such as digging cattleproof trenches and posting community guards. The amount paid is related to the area of forest land being protected, and the per hectare cost to MPFD of protecting that area in the absence of community participation. Funds are released only after the District Forest Officer has ascertained that the designated area has been satisfactorily protected during the previous year.

In Burkina Faso, under a recently approved GEF- financed project (PRONAPE), local communities will become concessionaires on Government-owned land in exchange for taking on stewardship responsibilities. As concessionaires, the communities will be able to contract with safari hunting and tourism operators to earn revenues. Recognizing that such revenues are likely to take years to materialize, however, the project will begin by providing direct payment for land stewardship into a community trust.

In South Africa, the “Working for Water” program pays local entrepreneurs for conservation services in the form of clearing of invasive alien vegetation. This program is highly successful in part because it serves simultaneously as an employment and entrepreneurship capacity building program for the poor.

The direct payment approach is often perceived to be very expensive. However, Simpson and Sedjo (1996) and Ferraro and Simpson (2000) and have presented persuasive arguments that it is no more expensive, and in fact is likely to be

more cost-effective, than conventional project-based approaches. Taking a forest conservation project in Madagascar as an empirical example, they estimated that the cost of protecting the forest through indirect approaches (such as subsidizing beekeeping), was more than twelve times as much as a direct subsidy would cost, and more than 350% higher than the opportunity costs (it would be far cheaper to buy the land outright). While probably the first attempt to model this comparison with respect to biodiversity, their conclusions echo those of Faeth et al. (1991), who demonstrated that direct subsidies would be much more efficient than the existing indirect crop subsidy programs as a means of helping small farmers in the U.S.

Ferraro and Simpson (2000) also analyzed another type of indirect intervention commonly found in conservation projects in developing countries: support for agricultural intensification. This approach is aimed at producing higher yields and incomes on existing cultivated land, thus reducing peoples' need and motivation to expand further into natural habitats. They concluded that this too would likely cost more than direct conservation payments. Aside from this, several studies have shown that support for agricultural intensification, like land security, can have the opposite effect: where there is good access to markets, increasing the profitability of agriculture by subsidizing agricultural inputs or infrastructure may stimulate people (residents and newcomers) to expand the area of cultivation even more to take advantage of the opportunity (e.g. Helmuth 2001; Angelsen and Kaimowitz, 1999).

Non-Economic Incentives

Economic incentives are not always the only factor in landowners' decisions to conserve biodiversity. Langholz (1996, 1999) found that many private landholders in Costa Rica placed economic incentives below considerations such as enhanced protection of their assets and social prestige as a reason for choosing to put their land into a private reserve scheme. In the Ben Udyam sustainable forest management project in Nepal, obtaining longer-term, more secure use rights to forest areas was a stronger incentive for participation among community members than was income generation (Margoluis and Margoluis 2000).

"Homesteaders" laying claim to land by converting it from a natural state to another use is a familiar story. Even in Costa Rica, which has some of the most conservation-friendly policies in the world, the law recognizes occupancy with "improvements" as a step in gaining land title, and the government will provide compensation for clearings, buildings and other investments if the land is later expropriated. Much less common is the reverse situation, in which people can lay claim to land by restoring natural habitat. This was, however, the principle behind the Ndirande Mountain Rehabilitation Project in Malawi, funded by the U.S. Agency for International Development, under its COMPASS program. In an effort to restore the badly degraded Ndirande Mountain Forest Reserve near Blantyre, the Forestry Department demarcated plots of about one acre, to be allocated to individual community members by a local committee. To retain the plots, beneficiaries were responsible for rehabilitating them, including planting both indigenous and exotic tree species recommended by the committee. The project was initially successful, as the

new plot owners purchased and planted 83,000 tree seedlings, with an estimated 80% survival rate. Unfortunately, the project later collapsed as a result of alleged corruption on the part of some members of the project committee who were accused of diverting funds and of failing to consult with other community members.

ISSUES IN APPLYING NON-PROJECT APPROACHES IN DEVELOPING COUNTRIES

Land purchase, easements, subsidies and direct payments are the predominant models for conservation in industrialized countries but are relatively rare in developing countries. Some of the likely reasons lie in the nature of developing country economies and legal and social systems.

For example, non-project approaches are easier to use when land is privately owned, either by individuals or by corporations, than when it is held communally and/or without a legal title. In southern Africa, where a higher proportion of land is privately owned, and land rights are clearer than elsewhere on the continent, easements and other contractual models are more common. In communal situations, there must first be a reasonably effective, legally recognized organizational structure to negotiate and implement contractual arrangements. Even so, a few individuals who refuse to comply with the agreement can undermine the whole initiative. Even in Namibia and South Africa, where wildlife conservancies are increasingly common on privately owned land, conservancies involving communally held land have often been difficult to put in place. There are, however, some successful examples such as the Mdluli Tribal Trust, which has obtained title to traditional community lands inside the Kruger National Park in South Africa and is maintaining it as a wildlife area.

Another significant complication is that rural populations in developing countries mostly earn their living directly from subsistence agriculture, livestock or extraction of natural resources. When land is dedicated to conservation through purchases, easements or direct payments, people may become dispossessed if their land rights are not secured. This amounts to involuntary resettlement which conservation groups and official donors strongly prefer to avoid. Even if the local people become the direct beneficiaries of conservation-related payments, large numbers of people may become unemployed (direct conservation activities will rarely employ more than a small fraction of them). This is likely to lead to social disruption, and many of the people are likely to continue their previous activities covertly in any case. Therefore, a land acquisition or direct conservation payment initiative in a developing country may still need to be part of a broader package of development assistance, including measures to generate alternative employment. In contrast to the typical ICDP, however, this employment would be focused away from the conservation area and would not normally involve use of its biodiversity.

In industrialized countries, the financial incentives provided to landowners for entering into easements or changing land use practices are often partly or entirely in the form of property tax breaks. This is not meaningful in countries where property taxes do not exist or routinely go unpaid. Therefore, the financial incentives must be

provided as direct cash transfers, which is usually more difficult to obtain than tax relief. There is also the issue of enforcement and timing of payments. The weak judicial systems typical of many developing countries can make it difficult to obtain and enforce long-term legal commitments, so the most likely method is to provide the payments over time. However, it may be necessary “frontload” payments, particularly if the short term opportunity costs to the landholders are high. A balance must be struck between effective short term incentives and sustainable long-term incentives.

Finally, the donors who provide most conservation funding tend to feel a responsibility to ensure that the funds they provide is used in socially equitable and constructive ways. This is difficult to do when landholders receive direct cash payments and are free to use them as they wish. Even where direct payment is being tried, the tendency is to introduce project-related mechanisms to control how the beneficiaries use the funds. For example, in the Madhya Pradesh example, only one third of the payment to communities is untied; two thirds must be used to finance approved community development plans. The Wildlife Conservation Leasing program in Kenya provides an innovative alternative. The local community puts a high value on education but children are often pulled out of school because there is not money to pay school fees. While recipients are not told what they must do with the lease payments, the payments are made in installments at the time that school fees are due, and are usually used for this purpose. The result is that school enrollment (particularly of girls) is higher in areas participating in the program than in neighboring areas.

The constraints described here need to be addressed but they are not insurmountable, as is demonstrated by the numerous ongoing non-project, incentive-based initiatives in developing countries. While these approaches will not work in all cases, the same is clearly true for the project-based approaches that currently dominate conservation practice and funding. In most cases both project- and non-project-based approaches merit consideration.

CONCLUSION: MAKING COMMUNITY- BASED CONSERVATION WORK

Community-based conservation is based on the premise that, in order to succeed in the long term, biodiversity conservation must yield economic benefits for local communities. This paper fully supports that premise, particularly when it comes to biodiversity outside PAs, where private or communal landholders make the daily land and resource use decisions that determine whether biodiversity will survive or be lost. If they do not see biodiversity conservation as a priority, the land will be converted to other uses.

While this is the principle behind ICDPs, in practice it has proven difficult to make direct and concrete linkages between the conservation and development objectives. As a result, few ICDPs can demonstrate clear biodiversity impacts, and even the extent and sustainability of their development impacts are often debatable. The problem lies not in the concept of integrating conservation and development, but in the reliance on the “project model,” which fails to create real incentives for achieving conservation outcomes. The alternative explored in this paper is to use non-

project approaches to provide direct, positive incentives for conservation. The beneficiaries (actually, service providers) can then use this income to improve their living conditions and invest in their own development. Project-based assistance can be used to help communities overcome specific constraints and obstacles, but cannot substitute for direct incentives as a means to motivate people to maintain biodiversity on their lands.

REFERENCES

- Alvard, M.S., J.G. Robinson, K.H. Redford, and H. Kaplan. 1997. The sustainability of subsistence hunting in the neotropics. Conservation Biology 11:977-982.
- Angelsen, A. and D. Kaimowitz. 1999. Rethinking the causes of deforestation: lessons from economic models. The World Bank Research Observer, Vol. 14(1), February, 1999, pp. 73-98.
- Barrett, C. B. and P. Arcese. 1995: Are Integrated Conservation-Development Projects (ICDPs) sustainable? On the conservation of large mammals in Sub-Saharan Africa. World Development, Vol. 23 (7): pp. 1073-1084.
- Bennet, E., H. Eves, J. Robinson and D. Wilkie. 2002. Why is eating bushmeat a biodiversity crisis? Conservation In Practice 3(2):28-29.
- Bennett, E. L., and J.G. Robinson. 2000. Hunting of Wildlife in Tropical Forests: Implications for Biodiversity and Forest Peoples. Environment Department Papers No. 76. Washington, D.C: The World Bank.
- Brandon, K., K.H. Redford and S.E. Sanderson. 1998. Parks in Peril: People, Politics and Protected Areas. Washington DC: The Nature Conservancy/Island Press:
- Bruner, A.G., R. E. Gullison, R. E. Rice, G. A. B. da Fonseca. 2001. "Effectiveness of parks in protecting tropical biodiversity." Science, Vol. 291. 5 January, 2001.
- Cabarle, B., J. Bauer, P. Palmer, P. and M. Symington. 1992. "BOSCOSA, the program for forest management and conservation on the Osa Peninsula, Costa Rica." Project Evaluation Report. USAID-Costa Rica. 92 pp.
- Chichilnisky, G. and G.M. Heal. 1998. "Economic returns from the biosphere" Nature, Vol. 391: 629-630.
- Donovan, R. 1994. "Forest conservation and management through local institutions (Costa Rica). In: Western, D. and R. M. Wright, (eds.) Natural Connections:

Perspectives in Community-Based Conservation. : Washington, D.C.: Island Press. 581 pp.

- Faeth, P., R. Repetto, K. Kroll, Q. Dai, G. Helmers. 1991. Paying the Farm Bill: U.S. Agricultural Policy and the Transition to Sustainable Agriculture. World Resources Institute: Washington, D.C.
- Ferraro, P.J. and R. D. Simpson. 2000. "The Cost-Effectiveness of Conservation Payments." Resources for the Future Discussion Paper 00-31, July 2000.
- Foroohar, R. 2001. "The Green Game." Newsweek, August 27, 2001.
- Hackel, J.D. 1999. "Community Conservation and the Future of Africa's Wildlife." Conservation Biology 13(4):720-734.
- Hardner, J. and R. Rice, 2002. "Rethinking green consumerism." *Scientific American*, May 2002. pp 89-95.
- Heal, G.M. 2000. Nature and the Marketplace: Capturing the Value of Ecosystem Services. Washington, DC: Island Press: 203 pp.
- Helmuth, L. 2001. "Economic development: a shifting equation links modern farming and forests." Science, 12 November, 2001:1283.
- Hulme, D. and Murphree, M. 1999. "Communities, Wildlife and the "New Conservation" in Africa." Journal of International Development (Policy Arena). Vol. 11:277-285
- Innes, R., S. Polasky and J. Tshirhart, 1998. "Takings, compensation, and endangered species protection on private lands." Journal of Economic Perspectives. Volume 12(3), Summer 1998. pp. 35-52.
- Jensen, D.B., M. Torn and J. Harte. 1990. In our own hands: A strategy for conserving biological diversity in California. California Policy Seminar, research report. Berkeley: University of California.
- Kellert, S.R., J.N. Mehta, S.A. Ebbin and L.L. Lichtenfeld 2000. Community Natural resource management: promise, rhetoric and reality. Society and Natural Resources, 13:705-715.
- Kiss, A., 1999. Making community-based conservation work. Paper delivered at annual meeting of the Society for Conservation Biology, Greenbelt, Maryland.
- Kramer, R., Carel Van Schaik and Jule Johnson (Eds.), 1997: Last Stand: Protected Areas and the Defense of Tropical Biodiversity. Oxford University Press.

- Langholz, J. 1996. Economics, objectives and success of private nature reserves in Sub-Saharan Africa and Latin America. *Conservation Biology*, 10:271-280.
- Langholz, J. 1999. Conservation Cowboys: Privately-Owned Parks and the Protection of Biodiversity in Costa Rica. Ph.D. Dissertation, Cornell University, New York.
- Margoluis, R. and C. Margoluis . 2000. Lessons from the Field: Linking Theory and Practice in Biodiversity Conservation. Washington, D.C.: Biodiversity Support Program
- Murombedzi, J. C. 1999. Devolution and stewardship in Zimbabwe's CAMPFIRE programme. *Journal of International Development (Policy Arena)*. Vol. 11: 287-293.
- Murray, W., 1995. Lessons from 35 years of private reserve management in the USA: the preserve system of The Nature Conservancy. In: Jeffrey McNeely, ed.: Expanding Partnerships in Conservation. Washington, D.C.: Island Press.
- Musters, C.J.M., M. Kruk, H.J. De Graaf, and W.J. Ter Keurs. 2001. Breeding birds as a farm product. *Conservation Biology*, 5 (2), April, 2001, pp 363-369.
- Newmark, W.D. and J.L. Hough 2000. "onserving wildilfe in Africa: Integrated Conservation and Development Projects and beyond. *BioScience*. Vol 50(7): 585-592.
- Oates, J. 1999. Myth and Reality in the Rain Forest: How Conservation Strategies are Failing in West Africa. University of California Press, Berkeley. 310 pp.
- Organization for Economic Cooperation and Development, 1999. Handbook of Incentive Measures for Biodiversity: Design and Implementation. (Summary case studies accessible through OECD Website: <http://www.oecd.org/env/eco/biod.htm>)
2000. Aid Targeting the Rio Conventions: First Results of a Pilot Study. Paris: OECD
- Redford, K.H. 1992. The empty forest. *BioScience* 42:412-22.
- Redford, K.H. and B.D. Richter 1999. Conservation of biodiversity in a world of use. *Conservation Biology* 13:1246-1256.
- Robinson, J. G. and K. H. Redford 1994a. Community-based approaches to wildlife conservation in neotropical forests. in: Western and Wright, eds. Natural Connections: Perspectives in Community-Based Conservation, Island Press, Washington, D.C. 581 pp.

- 1994b Measuring the sustainability of hunting in tropical forests. Oryx 28: 249-256.
- Roe, D., J. Mayers, M. Grieg-Gran, A. Kothari, C. Fabricius, R. Hughes 2000. Evaluating Eden: Exploring the myths and realities of community-based wildlife management. Series No. 8: Series Overview. IIED Publications.
- Rojas, M. and B. Aylward 2001. The Case of La Esperanza: a small, private hydropower producer and a conservation NGO in Costa Rica. (in) Land Water Linkages in Rural Watersheds Case Study Series, FAO.
- Satchell, M. 2000. Hunting to extinction. U.S. News and World Report, October 9, 2000. (Online: Science and Ideas 10/9/00: <http://www.well.com/user/dafidu/hunting.html>)
- Seymour, F. and N. Dubash 2000. The Right Conditions: The World Bank, Structural Adjustment, and Forest Policy Reform. World Resources Institute
- Simpson, R.D., and R. A. Sedjo 1996. Paying for the conservation of endangered ecosystem: a comparison of direct and indirect approaches. Environment and Development Economics 1:241-257.
- Steinberg, P. F. 1998. Defining the Global biodiversity mandate: implications for international policy. International Environmental Affairs, Vol. 10 (2), pp. 113-130.
- Wells, M.; S. Guggenheim, A. Khan, W. Wardojo, and P. Jepson. 1999. Investing in biodiversity: a review of Indonesia's integrated conservation and development projects. The World Bank, Washington, D.C.
- Wilson, E.O. 2002. The Future of Life. New York: Alfred Knopf. 256 pp.
- Wunder, S., 2001. The Economics of Deforestation: The Example of Ecuador. Hampshire, U.K.: Palgrave Macmillan Ltd: 256 pp.

ⁱ International Bank for Reconstruction and Development/International Development Association

ⁱⁱ Global Environment Facility (a grant fund administered by the World Bank and implemented by WB, UNDP and UNEP)

ⁱⁱⁱ ?For purposes of this discussion, the term "land" includes territory that is partially or entirely underwater, e.g. wetlands, lakes, coastal areas, etc

^{iv} S. Noemdoe, Republic of South Africa Working for Water Programme, pers. comm..

^v For discussion see Steinberg, 1998

^{vi} Monoculture *A. koa* plantations have apparently not yet emerged