



POLICY FORUM: ECOLOGY

Direct Payments to Conserve Biodiversity

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The international community has invested billions of dollars to stem the loss of biodiversity in developing nations (1, 2). Despite these investments, the loss continues (3, 4).

Biodiversity is a public good and thus is not supplied in sufficient quantities by individuals acting in their own self-interest. Conservation practitioners try to provide individuals who destroy ecosystems and species with incentives to preserve them. These incentives lie on a spectrum from indirect to direct with respect to their link with conservation objectives (see figure, this page). Conservation initiatives in the United States, Australia, and most of Europe increasingly emphasize more direct incentives: land purchases, leases, and easements, as well as financial incentives such as performance payments and tax relief. For example, the U.S. government spends over \$1.7 billion per year to induce farmers to protect land (5), and The Nature Conservancy, with an annual budget of more than \$700 million, operates almost exclusively through land purchases and easements (6, 7).

These payment approaches are based on a willing buyer–willing seller model. Sellers deliver conservation outcomes in exchange for a negotiated payment in cash or in kind. Payments are conditional on conservation outcomes.

Conservation in developing nations has emphasized the more indirect end of the spectrum. Indirect approaches include initiatives like Integrated Conservation and Development Projects (ICDP) and Community-Based Natural Resource Management. Such projects encourage rural communities to maintain biodiversity by helping them to use it sustainably. They may also provide alternative sources of products, income, or social benefits (schools, wells, clinics, etc.) as a means of encouraging communities to cooperate. These kinds of efforts have been referred to as “conservation by distraction” (8).

After decades of global efforts to conserve biodiversity through indirect ap-

proaches, there is a growing recognition that such initiatives rarely work. Some authors (9, 10) have pointed to basic conceptual flaws; for example, people are more likely to incorporate new sources of income as complements to existing activities rather than as substitutes for them. Others have noted that the technical, economic, social, and political conditions needed for

may displace biodiversity loss to other areas, may be misappropriated or misused, and may create social conflict. However, these problems generally apply equally to indirect interventions.

Direct payments might be seen as a form of bribery or an imposition of Western values on developing nations. However, investments that encourage eco-tourism or create markets for tagua nuts are equally aimed at inducing rural communities to change their land use and livelihoods in response to Western values.

Recent debates (17) have highlighted four issues that need be examined in relation to direct and indirect approaches.

1) *Institutional complexity.* Indirect and direct approaches require institutions that can monitor ecosystem health, resolve

conflict, coordinate individual behavior, and allocate and enforce rights and responsibilities. A system of conservation payments, however, allows practitioners to focus their energies on designing the requisite institutions. Existing direct payment initiatives have estimated administrative costs from 5% to 25% of the operating budget (18–20), whereas ICDPs have administrative costs at least as high, and often higher (21). A developing nation may not have the institutional capacity to make contractual agreements and to manage money

in a direct payment initiative. If, however, it lacks such capacity, it would not likely have the institutional capacity to implement a more complex indirect intervention.

2) *Costs.* In general, a direct payment approach will be more cost-efficient than any indirect approach (8, 22). For example, an analysis of a conservation intervention in southeastern Madagascar (22) indicates that, were the nearly \$4 million of available conservation funds invested in annual payments conditional on the protection of forest, about 80% of the original forest could have been protected into perpetuity, whereas only 12% could have been protected through support of indirect incentives. Furthermore, rural residents receiving conservation payments would have received incomes two times those that could be generated through an indirect in-

Potential Investments for Biodiversity Conservation

Investment	(Least direct)	Examples
Support for the use/marketing of extracted biological products		Logging, nontimber forest product extraction, and hunting
Subsidies for reduced-impact land and resource use		Sustainable agriculture on already cultivated lands, “alternative income generation”
Support for the use and or marketing of biodiversity within relatively intact		Eco-tourism, sport hunting, bioprospecting, wild honey production
Payment for other environmental services (generating biodiversity conservation as a side benefit)		Watershed protection, carbon sequestration
Payment for conservation land or “retirement” of biodiversity use rights		Easement, “nonlogging” concessions
Performance-based payment for biodiversity conservation		Paying for bird breeding success, paying for occupied wolf dens
	(Most direct)	

an indirect approach to succeed are difficult to find in the real world (11, 12). For conservation initiatives that encourage extractive activities (e.g., nontimber forest product collection), sustainability is a key concern (13–15). A recent review of ICDPs (16) declared that there was “a notable lack of successful and convincing cases where people’s development needs have been effectively reconciled with protected area management.”

Indirect Versus Direct Approaches

Potential obstacles to implementing a direct payment approach in developing nations include uncertain or inequitable land tenure, limited experience with and enforcement of legal contracts, and limited local opportunities for nonagricultural investment or employment. Direct payments

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tervention. The basic principle is that the cheapest way to get something you want is to pay for what you want (e.g., protected rain forest), rather than pay for something indirectly related to it (e.g., capital for improving eco-tourism), or more simply "you get what you pay for."

Paying people to protect habitat and wildlife can be surprisingly affordable. Many of the regions in which conservation practitioners work are at the margins of the economy where other land uses do not generate substantial net returns. For example, the middle-income nation of Costa Rica pays rural residents about \$35 annually per hectare of forest protected, and excess demand for conservation contracts suggests that these payments are higher than necessary (23). Even cheaper, Conservation International is protecting 81,000 hectares of rain forest in Guyana through a conservation concession that costs \$1.25 per hectare per year (24), and The Wildlife Foundation in Kenya is securing migration corridors on private land through conservation leases at \$4 per acre per year (25, 26).

We are not arguing against short-term assistance for profitable, eco-friendly activities that can protect biodiversity. Conservation practitioners and donors, however, must ask themselves why external assistance is necessary if these activities are so profitable (27). Rural residents may face credit constraints, misunderstand the benefits conservation would afford them, or be unable to organize to realize the benefits, but we suspect that such conditions are rarely the main constraints.

3) *Development benefits.* The indirect approach is attractive to many stakeholders because it seems to achieve conservation and development objectives simultaneously (despite evidence suggesting it achieves neither in most cases). However, direct payments benefit poor farmers by improving cash flows, providing a fungible store of wealth, and diversifying sources of household income. Furthermore, under a payment approach, the land holders/resource users decide how best to meet their own goals and aspirations, rather than being subsidized to carry out predetermined activities as is the case under the indirect approach.

Paying an individual or community for "not doing something" might be seen as a form of social welfare rather than development. However, the idea that conservation payments are a form of welfare belies what conservationists have been arguing for decades: Biodiversity is a valuable commodity and biodiversity protection is an alternative land use.

4) *Sustainability.* The Holy Grail for the international conservation community is the self-financing conservation activity.

Direct payments are seen as undesirable because they require an ongoing financial commitment to maintain the link between the investment and the conservation objectives. Like the legendary Holy Grail, however, the self-financing conservation activity is elusive. Indirect approaches are also likely to require a sustained flow of funds over time. A recent World Bank analysis of ICDPs (16) argued that conservation initiatives "based on simplistic ideas of making limited short-term investments in local development and then hoping this will somehow translate into sustainable resource use and less pressure on parks need to be abandoned."

Future Prospects

Direct payment initiatives are rare in developing nations, but conservation pioneers are experimenting with them. A recent symposium (17) highlighted the use of forest protection payments in Costa Rica, conservation leases for wildlife migration corridors in Kenya, conservation concessions on forest tracts in Guyana, and performance payments for endangered predators and their prey in Mongolia. South Africa and American Samoa have over a decade of experience with "contractual national parks," which are leased from communities. Other payment initiatives are being designed or are under way in Mexico, El Salvador, Colombia, Honduras, Guatemala, Panama, Russia, and Madagascar (28). Payments can be made for protecting entire ecosystems or specific species, with diverse institutional arrangements existing among governments, firms, multilateral donors, communities, and individuals.

Direct payment approaches are not "silver bullets" that can be applied immediately and easily in all situations. Furthermore, broader policy interventions, such as removing perverse direct and indirect subsidies that encourage the loss of habitats and their biodiversity (29, 30), are also needed. However, people will generally do what is in their own interest, particularly their short-term interest. If they can receive more benefits from clearing an area of habitat than they could from protecting it, they will clear it. A society would never think to provide a public good like national defense through indirect means. The conservation community must reconsider its attempts to provide biodiversity through indirect means. If we want to get what we pay for, we must start tying our investments directly to our goals.

References and Notes

1. J. Hardner, R. Rice, *Sci. Am.* (May), 89 (2002).
2. A. James *et al.*, *BioScience* **51**, 43 (2001).
3. F. Achard *et al.*, *Science* **297**, 999 (2002).
4. A. Balmford *et al.*, *Science* **297**, 950 (2002).
5. *FY 2001 Budget Summary* (U.S. Department of Agriculture Washington, DC, 2001); available at www.usda.gov/agency/obpa/Budget-Summary/2001/text.htm
6. *2001 Annual Report* (Nature Conservancy Washington, DC, 2002); available at <http://nature.org/about-us/annualreport2001/>.
7. More examples can be found at <http://epp.gsu.edu/pferraro/special/special.htm>.
8. P. J. Ferraro, R. D. Simpson, *Land Econ.* **78**, 339 (2002).
9. P. J. Ferraro, *Conserv. Biol.* **15**, 990 (2001).
10. A. Kiss, "Making biodiversity conservation a land use priority," in *Getting Biodiversity Projects to Work: Towards More Effective Conservation and Development*, T. McShane and M. Wells, eds. (Columbia Univ. Press, New York, in press).
11. N. Salafsky *et al.*, *Evaluating Linkages Between Business, the Environment, and Local Communities: Final Analytical Results from the Biodiversity Conservation Network* (Biodiversity Support Program, Washington, DC, 1999).
12. D. Roe *et al.*, *Evaluating Eden: Exploring the Myths and Realities of Community-Based Wildlife Management* [Series No. 8, International Institute for Environment and Development (IIED) Publications, London, 2001], 62 pp.
13. D. D. Tewari, J. Y. Campbell, *Unasylva* **187**, 26 (1996).
14. C. B. Barrett, P. Arcese, *Land Econ.* **74**, 449 (1998).
15. S. Norris, N. L. Chao, *Conserv. Pract.* **3**, 30 (2002).
16. M. Wells *et al.*, *Investing in Biodiversity: A Review of Indonesia's Integrated Conservation and Development Projects* (East Asia Region, World Bank, Washington, DC, 1998).
17. Direct Payments as an Alternative Conservation Investment, a symposium at the 16th Annual Meetings of the Society for Conservation Biology, Canterbury, England, 15 July 2002. For more detail, see <http://epp.gsu.edu/pferraro/special/special.htm>.
18. "Project appraisal document on a proposed IBRD loan of US\$32.6 million to the Republic of Costa Rica and a grant from the Global Environment Facility Trust Fund of SDR 6.1 million (US\$8 million equivalent) to the National Forestry Financing Fund for the Ecomarkets Project," San Jose, Costa Rica, 15 May 2000 (Central American Department, Latin America and the Caribbean Regional Office, World Bank, Washington, DC, 2000).
19. E. Ortiz, Instituto Tecnológico de Costa Rica, personal communication.
20. "The environmental effects of agricultural land diversion schemes" [Organization for Economic Cooperation and Development (OECD), Paris, 1997].
21. J. Peters, *J. Agric. Environ. Ethics* **11**, 17 (1998). Peters, a former consultant to an African ICDP, estimated that 55% of his ICDP's budget went to U.S.-based administrative overhead and expatriate technical consultants, which is a common outcome among ICDPs. Only 2% of the budget went to rural residents living around the endangered rain forest ecosystem.
22. J. C. Conrad, P. J. Ferraro, "Habitat conservation: The dynamics of direct and indirect payments" (Environmental Policy Working Paper Ser. 2001-005, Andrew Young School of Policy Studies, Georgia State University, Atlanta, GA, 2001); available at <http://epp.gsu.edu/pferraro/docs/ConradFerraroWorkingPaper2001Distrib.pdf>
23. E. Ortiz, paper presented at the symposium, Direct Payments as an Alternative Conservation Investment (17).
24. R. Rice, paper presented at the symposium, Direct Payments as an Alternative Conservation Investment (17).
25. H. Gichohi, paper presented at the symposium Direct Payments as an Alternative Conservation Investment (17).
26. R. E. Gullison *et al.*, *Nature* **404**, 923 (2000) for other examples of inexpensive payment initiatives.
27. P. J. Ferraro, R. D. Simpson, *Resources* **143**, 17 (2001).
28. For more details and examples, see (10) and <http://epp.gsu.edu/pferraro/special/special.htm>.
29. N. Myers, J. Kent, *Perverse Subsidies* (Island Press, Washington, DC, 2001).
30. S. L. Pimm *et al.*, *Science* **293**, 2207 (2001).