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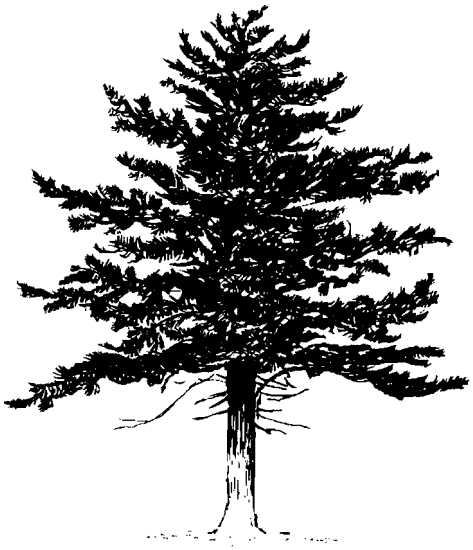

Locating Tropical Biodiversity Conservation Amid Weak Institutions

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Abstract

This paper addresses the broad question of where to locate authority for tropical biodiversity conservation considering: (1) community-based natural research management (CBNRM) overreaches the indisputable place of local communities in tropical conservation efforts; (2) the most promise for tropical conservation and development is offered by multiple layers of nested institutions; (3) the greatest challenge for implementation of multiple layer designs is weakness at all levels of existing tropical institutions; and (4) rehabilitating such institutions, facilitating ongoing coordination among them, and introducing new and appropriate institutional designs will require significant international and national policy reorientation and greater commitment of financial and technical assistance.

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Locating Tropical Biodiversity Conservation Amid Weak Institutions

An ideational revolution has fundamentally changed the complexion of tropical conservation and development over the past twenty years. In the 1960s-70s, deep-seated concern over the real or perceived weaknesses of both markets and local communities spurred the concentration of broad authority over matters of economic development and environmental protection in the hands of national bureaucracies. In response to real or perceived government failures under these arrangements, a defining feature of the past twenty years has been the ubiquitous roll-back of tropical states. In the realm of development, this has been manifest in pervasive market-oriented liberalization and promotion of indigenous nongovernmental organizations. In conservation, the movement has been largely to community-based natural resource management (CBNRM). But what happens if the institutions of both government agencies and communities are ill-equipped to handle the challenges of biodiverity conservation?

In this paper, we address the broad question of where to locate authority for tropical biodiversity conservation. In so doing, we advance four claims. First, the current fashion for CBNRM overreaches the indisputable place of local communities in tropical conservation efforts. An unfortunate irony of the current celebration of local authority is that it facilitates the abdication of global responsibility. Second, given variability in scale and institutional capability, hybrid designs involving multiple layers of nested institutions offer the most promise. Third, the greatest challenge to implementing such designs is the (often growing) weakness of existing

tropical institutions at all levels. Fourth, rehabilitating such institutions, facilitating ongoing coordination among them, and introducing new institutional forms appropriate to particular conservation challenges will require, at both international and national levels, significant policy reorientations and greater commitments of financial and technical assistance. The pace of reform, and levels of assistance will need to be substantially greater than presently prevail.

The Seductive Appeal of Community-Based Natural Resource Management

It is widely believed that the state-directed "fences and fines" approach of protected area management failed to ensure biodiversity conservation in the tropics and sub-tropics and has contributed in some places to the marginalization and poverty of the rural poor excluded from parks (1). Although we know of no careful, empirical test of this hypothesis, it has become received wisdom in conservation circles. In light of this belief, the possibility of "win-win" approaches in which conservation objectives can be reconciled with rural poverty alleviation and other intrinsically desirable goals holds considerable appeal. Hence the rising enthusiasm for strategies founded on community-based natural resource management (CBNRM), in which low-income rural communities are "empowered" in an attempt both to capture locally the potential social benefits of sustainable resource use and to improve the application of scientific understanding and appropriate technologies to field-level conservation efforts (2). Community now seems the default locus of most tropical conservation activity.

CBNRM understandably excites the interest and imaginations of conservation groups and international development agencies. Although careful students of CBNRM acknowledge that performance varies widely and depends on satisfying certain ecological and institutional

conditions, the discussion commonly sidesteps the deeper issues on which successful conservation efforts depend. In particular, implementation of CBNRM schemes too often proceeds from untested biological and socio-economic assumptions, some of which are likely to be false in many if not most situations (3). If these conditions and assumptions continue to be ignored, excessive focus on CBNRM projects may lead to squandered opportunities for both conservation and development and to inflamed tensions between poor tropical communities and outsiders interested in the ecosystems in which those communities dwell. This paper calls attention to those assumptions and to tries to place CBNRM within a broader suite of prospective conservation management options.

Communities' Place In The Broader Conservation Challenge

The major underlying assumption of CBNRM is that the local community is the appropriate locus of conservation management. This assumption subsumes within it other implicit, and often questionable assumptions, such as: the spatial scale of the ecosystem corresponds to that of the community; locals can control the exploitation problem; communities have incentives to overexploit resources if they are not involved in resource management; natural resource management is equivalent to management for biodiversity conservation; CBNRM will generate benefits that are sufficiently large and sustainable to keep locals from overexploitation; communities are reasonably homogenous and that this homogeneity produces successful collective action; communities have and can apply existing formal and informal rules to manage natural resources. If one acknowledges that such assumptions are not always and everywhere true, then the current fashion for devolving conservation management to local control whenever

possible overreaches. The problem is not so much putting resources at the disposal of local peoples or having them decide what to do with such resources, as it is rather ensuring that the incentives locals face truly encompass the full range of social costs and benefits associated with the biological resource.

The core challenge of tropical environmental conservation is the problem of reconciling private and social incentives, or what economists term the problem of "externalities". As Hardin famously pointed out in articulating the "tragedy of the commons," individuals often have no incentive to take account of the common good of environmental conservation, and therefore they rationally overexploit the natural resource base (4). The core question of conservation management is "how can we most effectively reconcile individual and social incentives so as to achieve common environmental objectives?" The answer depends on two key, broad factors.

Social and Ecological Scale

First, one needs to identify the social and ecological scale of the externality. Hardin's example and much subsequent work on common property management regimes focused on resources for which there exist important externalities among a spatially compact group of individuals. Rangeland grazing, maintenance of common irrigation infrastructure, and forest management are familiar examples (5). As a voluminous analytical and empirical literature demonstrates, there is most certainly a role for rural communities in halting natural resource degradation in such settings (6). When the core problem is environmental conservation for the maintenance of ecosystem services valued primarily, if not exclusively, by local residents,

community is sensibly the default locus of conservation management, although tough institutional questions remain (on which, more below).

But demands for *in situ* biodiversity conservation often relate to externalities that are both ecologically and socially broader. Even granting that communities can manage small areas, in many settings what is ecologically necessary far exceeds the space any single community can ably manage. Although distinct communities may share a common interest in a stationary terrestrial resource, such as forest and pasture, they do not necessarily have either tradition or means of reconciling their competing interests. The problem becomes especially evident in the case of migratory species, such as birds, butterflies, fish, and some ungulates. Can any one community effectively conserve whales or wildebeest?

The problem is not merely the ecological scale of the externalities, but also the social scale, the spatial range of people with an interest in tropical biodiversity protection. Distant human populations may have considerable interest in the conservation of carbon sinks in tropical rainforests, of ecosystems with high rates of endemism that might contain genetic material of incalculable value to medicine or agriculture, and of charismatic megafauna of spiritual or aesthetic value. The trick is how to incorporate outsiders' valuation of natural resources into local use decisions. The international Convention on Biological Diversity (CBD) attempted a Coasian solution to this problem by granting to host nations sovereign rights over the natural resources contained within their borders. But the substantial transactions costs of matching, for example, a California conservationist to forest dwellers in the Central African Republic, means that only a trivial portion of the external valuation of natural resources can be captured in commercial transfers associated with ecotourism, bioprospecting, or the marketing of nontimber forest

products (7). Official and nonprofit transfers do not begin to make up the difference. In Kenya, for example, the cost of protected area management is almost 3% of GDP, only a modest fraction of which comes from external donors (8). It is unrealistic to expect continued highly regressive financing of conservation efforts of global benefit on anything approaching ecologically-sensible scales, such as the IUCN's recommendation that 10-12 percent of each country's land mass be devoted to conservation. The expansion of community-based designs to suit the ecological scale of many conservation challenges runs headlong into formidable institutional challenges as to how to incorporate the enormous range of human interests.

A special concern we have with respect to the current fervor for community-based conservation is that it may deflect attention from the appropriate scale of burden-sharing. If the benefits of biodiversity conservation accrue well beyond the boundaries of local communities – to those who stand to benefit from future discoveries based on heretofore unrecognized genetic material, from global ecosystem services provided by tropical habitats, or from the mere existence of exotic species – then the costs must likewise be distributed more broadly. Celebration of the virtues of community can paradoxically turn into abdicating broader responsibilities, leaving the poor to bear the burden of protecting resources we all enjoy.

Interests and Institutions

The appropriate level at which to situate authority for conservation management is also a function of the social context: the actors and their respective interests, and the internal and external institutions that shape individual and collective choice. "Community" is itself rarely defined or carefully examined by proponents of CBNRM, who tend to portray, or even define

communities as a homogeneous group of people, as a unified, organic whole (9). But the myth of the "happy hut" has no firmer historical standing than the myth of the ecologically noble savage (10). Communities encompass gender and generational divides, individuals harboring different aspirations, leadership rivalries, and varying degrees and kinds of resource (over)exploitation (11). When there exist predictable rules and institutions that guide the interaction of actors with divergent goals, it is possible, although still not simple, at a local scale to identify and implement mechanisms by which individual incentives can be simultaneously aligned with the collective interest. The task becomes harder where economic, social, or technological conditions are highly variable or rapidly changing, since effective inducements can likewise change quickly (5). In the face of such complexity and in the name of respecting sovereignty, external promoters of CBNRM commonly deal directly with national and local leaders. As a consequence, even seemingly successful initiatives commonly become coopted by national political movements or local elites (12).

Successful conservation institutions, at whatever scale, must have the authority and ability to restrict access and use, to offer incentives to sustainable use of resources – which may mean no use at all – and to monitor conditions and make necessary adaptations to access rules and incentives (13). CBNRM schemes too often overemphasize incentives and underemphasize the other two necessary ingredients. Conservation schemes based primarily on positive inducements require benefit flows that are both large enough to be spread throughout the community, and temporally responsive to locals' adherence to resource use rules. It is difficult to meet both conditions. While some projects may enjoy success due to the massive external aid and/or the high returns from safari hunting, few countries can rely on such financial resources. In

particular, poor households are often assumed to have a fixed income need, and if projects can help households meet this need without consumptive recourse to natural resources, conservation goals will be advanced. The more common outcome, however, has been that a combination of increased income, absent social controls and project linkages, has simply allowed people to use resources more rapidly or that unanticipated shocks lead to conjunctural crises because schemes are ill-equipped to respond appropriately to evolving demands (14).

Community-based incentives work best when there are strong (formal or informal) local systems of social control and sanction to enforce access restrictions. In much of the tropics, however, weakness is the norm. Traditional community management systems are often overwhelmed, eroded or non-existent, resource markets are commonly incomplete and inefficient, and nation states are generally fiscally and politically fragile. When the scale-based default locus of conservation authority is institutionally ill-equipped for the task, it makes sense to consider relocating responsibility to higher level organizational units. For many years, the management capabilities of nation states were heavily overrated and those of local communities underrated. We fear that the reverse is true today.

One must be careful, however, not to equate higher level coordination with government. Alternative mechanisms exist, including federations, collectivities of interest groups, unions, etc., and can be effective in particular settings (15). Especially in the tropics, it seems imperative that we move beyond dichotomous conceptualizations of conservation management alternatives as either community-based or state-centered, expand the menu of available institutions, and improve the capability of existing institutions to handle the task. This must occur at both the intra- and inter-national levels. Despite the attempts of the Global Environmental Facility to address global

public goods associated with biodiversity conservation, no true mechanism yet exists for handling conservation challenges that cut across communities separated by national boundaries or to address the disparities between costs and benefits received at local, national, and international levels.

Decoupling Conservation and Development

Embedded within much of the contemporary dialogue is a facile assumption that poverty mitigation will improve biodiversity conservation. The relationship between poverty alleviation and conservation is complex and highly variable across space. Sometimes synergistic relations exist; sometimes the tradeoffs between improving human welfare and protecting the host environment are stark (16). The poor are neither the sole agents of destruction nor the only beneficiaries of conservation, and in many contexts are only weakly related to either. So while rural development may be necessary to tropical biodiversity conservation, it is certainly not sufficient.

Poverty and environmental problems have common structural factors in need of attention. But the range of environmentally friendly development or poverty alleviating conservation opportunities may be relatively limited. And policies aimed at trying to rectify two complex problems too often violate the Tinbergen principle of one policy instrument per objective, and thereby fail to address either aim satisfactorily. The core need is for sensible policies to rectify the asset poverty and vulnerability that too often causes poor people to overexploit the natural environment, to eliminate local and international elites' cheap access to scarce resources, to provide for proper protection of unique ecosystems, and to institutionalize compensatory

transfers between and within nations sufficient to reflect the spatial breadth and economic depth of environmental externalities (17).

Adaptive Management and the Need for Nested, Strengthened Institutions

Much of the current literature in ecology emphasizes the need for adaptive design and management. This guidance applies as much to the task of identifying the appropriate locus of conservation authority in a given setting as it does to the exercise of that authority. Neither CBNRM nor state-managed parks are always and everywhere appropriate. Sometimes the scale of the resource is too vast or local institutions too weak for community-based conservation to work. Likewise, sometimes the problem's scale is too local or larger-scale institutions too weak for state-directed conservation to succeed. Further, lest we forget the construction of conservation institutions is more than an exercise in optimizing over biological and economic parameters, the political costs and benefits of institutional creation and maintenance can also scuttle the best-made technical designs. The specific conditions prevailing with respect to any given resource in need of conservation vary widely enough that a portfolio approach involving coordinated nested institutions at multiple levels is surely necessary (18). Two problems immediately emerge.

First, relatively little theory or rigorous empirical evidence exists on how to distinguish and integrate management objectives and instruments across an array of biodiverse habitats of different scales, much less on how to coordinate the activities of multiple layers of conservation institutions each targeted at these different scales. As a starting point, it appears clear that the operational institutions of conservation should be matched to the spatial and temporal scale of

the underlying externality problem and the institutional capabilities at different levels of organization. And because the distribution of natural resources is a fundamentally political exercise, this also means that those individuals and groups with a stake in or significant influence over the externality problem must be included.

Investment needs to be directed less to communities or to parks *per se*, and more toward understanding and fostering flexible institutional arrangements at all scales – community, cooperatives, federations of communities or cooperatives, markets, local, regional, and national governments, and multinational agencies – that are predisposed to and capable of mediating and inducing desirable conservation and development outcomes. This includes widespread support of efforts to inculcate environmental values and respect for pluralism so that individuals are increasingly open and able to participate responsibly in such institutions, and have the ability to reshape it in the face of changing circumstances (19). Our limited understanding of institutional design and effect demands that research and practice focus on a wider set of institutional solutions, including hybrid institutional arrangements, such as comanagement and other forms of government, community, private sector arrangements.

Second, the challenge lies not so much in nesting institutions – communities are already nested within bureaucratic constraints, which in turn operate within a broader political arena, etc. – but in ensuring the competence of each constituent part and effective coordination among them. The main difference between relatively successful conservation initiatives in some parts of the high-income world and failed efforts in the low-income world relates less to differences in wealth or income than to the strength of the underlying institutions of community, state, and market. At the heart of most conservation success stories one finds decision-takers who themselves face

appropriate incentives related to conservation outcomes, who are committed to two-way communication with all stakeholders, and who are able to marshal and distribute resources enough to significantly alter resource users' incentives, to include providing appropriate compensation to those whose access becomes restricted (1,2,5,20). While the feedback relationship between economic and institutional development is complex and still poorly understood, more emphasis needs to be placed on firming up the foundations of the institutions of individual and collective choice. Unfortunately, neither dysfunctional communities nor inept bureaucracies are easily reformed. In some places and for some conservation objectives, the best bet will lie in creating new, responsive, and less traditional institutional structures (21).

Where all existing institutions are weak, communities don't trump parks, nor vice versa. And even where we find strong communities, it would be overly optimistic to think they can continue to operate effectively without other institutions to help support them. Successful alternatives to failed, centralized approaches and simplistic community-based models will need to include clear and enforced rules that relate directly to the externalities of the resource and the costs of multi-level collective action. Since the benefits of tropical biodiversity conservation typically extend far beyond the communities of local resource users or the boundaries of their nations, a significant share of the costs of developing and maintaining the institutional capacity to internalize biodiversity externalities necessarily must fall on wealthy foreign individuals, organizations, and nations. Tropical biodiversity conservation cannot be achieved on the cheap. The global beneficiaries of biodiversity must not abdicate complete authority and responsibility to either tropical states or indigenous communities, but rather must work to improve the capacity of nested institutions to induce and enforce tropical conservation.

References

1. D. Ludwig, R. Hilborn, and W. Walters, *Science* **260** (1993); K.Brandon, K.Redford, and S. Sanderson, eds., *Parks in Peril: People, Politics, and Protected Areas* (Washington: Island Press, 1998).

2. D. Western and R.M. Wright, eds., *Natural Connections: Perspectives in Community-Based Conservation* (Washington: Island Press, 1994); W.M. Getz et al. *Science* **283** (1999).

3. M. Wells and K. Brandon, *People and Parks: Linking Protected Area Management With Local Communities* (Washington: World Bank, World Wildlife Fund, and USAID, 1992); C.B. Barrett and P. Arcese, *World Development*, **23** (1995); K. Brandon, in D.R. Lee and C.B. Barrett, eds., *Tradeoffs or Synergies? Agricultural Intensification, Economic Development and the Environment in Developing Countries* (London: CAB International, 2000).

4. G. Hardin, *Science* **162** (1968).

5. E. Ostrom, *Governing The Commons* (Cambridge: Cambridge University Press, 1990); D. Bromley, ed., *Making The Commons Work* (San Francisco: Institute for Contemporary Studies, 1992).

6. J.-M. Baland and J.-P. Platteau, *Halting Degradation of Natural Resources: Is There A Role For Rural Communities?* (Oxford: Clarendon Press, 1996).

7. R.D. Simpson, *Issues in Science and Technology* (1999).

8. M. Norton-Griffiths and C. Southey, *Ecological Economics*, **12** (1995).

9. A. Agrawal and C.C. Gibson, *World Development* **27** (1999).

10. K. Redford, *Orion* **9** (1990).

11. K. Redford and J. Mansour (eds.), *Traditional Peoples and Biodiversity Conservation in Large Tropical Landscapes*. (Rosslyn, VA: The Nature Conservancy). J.R. Gusfield, *Community: A Critical Response* (New York: Harper and Row Publications, 1978).

12. C. Gibson and S. Marks, *World Development* **23** (1995); K. Hill, *African Studies Review* **39** (1996).

13. C. Kremen, A.M. Merenlender, and D.D. Murphy, *Conservation Biology* **8** (1994); E. Ostrom et al. *Science* **284** (1999).

14. C.B. Barrett and P. Arcese, *Land Economics* **74** (1998); P. Larsen, M. Freudenberger, and B. Wyckoff-Baird, *WWF Integrated Conservation and Development Projects: Ten Lessons from the Field, 1985-1996* (Washington: WWF, 1998); R. Margolius and N. Salafsky, *Measures of Success: A Systematic Approach to Designing, Managing, and Monitoring Community-Oriented Conservation Projects* (Washington: Island Press, 1998).

15. M.Navarro, in S. Eckstein, ed., *Power and Popular Protest: Latin American Social Movements* (Berkeley: University of California Press, 1989); B.S. Baviskar in M. Doornbos and K.N. Nair, eds., *Resources, Institutions, and Strategies: Operation Flood and Indian Dairying* (New Delhi: Sage Publications, 1990); A. Bebbington, in R. Peet and M. Watts, eds., *Liberation Ecologies: Environment, Development, Social Movements* (London: Routlege, 1996).

16. T. Reardon and S. Vosti, *World Development* **23** (1995); Birdsall, N. and J.L. Londono. 1997, *American Economic Review* **87** (May 1997): 32-37; D.R. Lee and C.B. Barrett, eds., *Tradeoffs or Synergies? Agricultural Intensification, Economic Development and the Environment in Developing Countries* (London: CAB International, 2000).

17. P. Dasgupta, *An Inquiry Into Well-Being and Destitution* (Oxford: Oxford University Press, 1993); C.B. Barrett, *Ecological Economics* **19** (1996); J. Heath and H. Binswanger, *Environment and Development Economics* **1** (1996).

18. A. Inamdar et al., *Science* **283** (1999); E. Ostrom et al., *Science* **284** (1999); J.B. Wilkinson, *Issues in Science and Technology* (1999).

19. C.B. Barrett and R.E. Grizzle, *Environmental Ethics* **21** (1999).

20. N. Uphoff, *Learning From Gal Oya* (Ithaca, NY: Cornell University Press, 1992); R. Margolius and N. Salafsky, *Measures of Success: A Systematic Approach to Designing, Managing, and Monitoring Community-Oriented Conservation Projects* (Washington: Island Press, 1998).

21. A. Umaña and K. Brandon in S. Annis, ed., *Poverty, Natural Resources, and Public Policy in Central America* (Washington: Overseas Development Council,1992)

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