Editorial

Reconciling Conservation Paradigms

In spite of decades of conservation efforts, biological diversity throughout the world continues to dwindle. Prevailing conservation models have had greater success in determining which species and ecosystems to conserve than in fully taking into account the social and cultural landscapes within which these conservation targets are embedded. International conservation organizations have tended to define conservation targets (and approaches) at large spatial scales in hopes that they may apply broadly. Thus, over the last few decades we have seen a succession of generalized, monolithic conservation models replacing one another or competing with one another for attention and resources (for a recent review see Redford et al. 2003. *Conservation Biology* **17:**116–131). These models have been developed within large international conservation organizations and are thus partly driven by a need for general application. The models, based on conservation science, seek unifying principles reflecting science's quest for general and widely applicable concepts. They tend to view the world through relatively coarse filters and may fail to encourage the emergence and spread of fine-grained models adapted to local conditions. Moreover, most models are directed toward the achievement of particular outcomes, rather than the support of systemic resilience.

Consequently, as Redford et al (2003) point out, we know more about *what* to conserve than *how* to conserve it. With the question of how to conserve, we are confronted with the complexity and heterogeneity of tropical ecosystems in particular, where much of the earth's biodiversity resides. Superimposed on this heterogeneity we find a myriad of social, economic, and institutional factors that determine the prospects for conservation. Conservation organizations, however, have rarely been able to pay sufficient attention to the social and cultural landscapes within which they work. In their review of 21 large-scale models, Redford et al. note that "12 address where to conserve and 9 how to conserve." But even these "how to" approaches are largely concerned with the definition of conservation targets at a finer scale, rather than the means for achieving conservation within given social and economic contexts.

Before the advent of modern science, many local communities were able to conserve biodiversity by following a myriad of approaches, ranging from strict preservation of sacred ecosystems or landscapes to "sustainable" use of resources. A variety of institutional frameworks, expressing cultural norms and sensitive to social and human capital, have underscored these multiple approaches. We argue that the best hope for conservation in a complex and rapidly changing world is to exploit a multiplicity of indigenously driven approaches that (1) draw upon accumulated local practices and institutions, both formal and informal, as well as modern science; (2) are locally adaptive; and (3) seek to enlarge human and social capital, in addition to natural capital.

Locally driven indigenous efforts incorporating participatory approaches, conflict resolution, and mutual learning are more likely to garner the relatively broad support and participation of local communities, even though communities are rarely unanimous in their interests. Empowering local communities and strengthening local institutions and organizations have enormous potential for conservation, not only in developing countries but elsewhere. Of course, it is naïve to suggest that in a world with increasing population, economic globalization, and migration, traditional approaches alone will conserve biodiversity. Decentralized community-based approaches, too, have their pitfalls. Nevertheless, a high degree of community involvement does seem to be a precondition for long-term success in areas where livelihood security is linked with the use of natural resources for a large number of people.

How, then, can global conservation organizations meet the challenge of reconciling their large-scale, target-based models; fund-raising; and organizational structures with the need for multiple, locally specific conservation strategies? First, it will be necessary to further develop flexibility, multiplicity, and local specificity in approaches. If there are indeed unifying and general principles of conservation that apply globally, we should expect them to emerge from accumulated experience in locally based initiatives, rather than from previously articulated theory or concept.

Second, multiple approaches that draw in part from local traditions and in part from natural sciences will require the adoption of strategies not dictated by conservation science alone. Conservation organizations must increase their ability to integrate natural and social concerns into their approaches. Conceptual integration can only be

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achieved by explicitly treating ecological and economic systems as a single unit. Moreover, every ecological-economic system is in a state of continuous change driven by a variety of pressures. Under conditions of rapid change, attempts to direct systems toward a predetermined state have often been frustrated. Thus, long-term conservation goals may best be achieved by a strong focus on building resilience within ecological and social systems. This primarily means building the institutional capacity to respond to shocks and surprises (Equator Initiative 2003. Available from http://www.undp.org/equatorinitiative/).

Third, and unsurprisingly, the sustainability of how-to efforts depends on the functioning and viability of local institutions at multiple organizational and spatial scales. Sustained partnerships must be encouraged between large, resource-rich conservation organizations and local, knowledge-rich institutions that aim to support or create an adequate formal and informal institutional framework (Western. 2003. *Conservation Biology* **17:**11–19). The local units of global conservation organizations often tend to perpetuate the ideas, myths, and approaches developed by the centralized parental units, rather than encouraging innovation and integration of approaches, and the strengthening of local formal and informal institutions at multiple scales.

Finally, international conservation organizations must promote South-South interactions and dialogues. There is much to be gained from experiences in different parts of Latin America, Africa, and Asia. These regions exhibit a number of social, cultural, economic, and traditional ecological knowledge attributes that are often best understood by people with the experience of living under comparable conditions. Systematic South-South interactions could be made more efficient and creative in many situations. Such interactions could be fostered by Internet and World Wide Web connections and networks, by support for flagging conservation science programs at chronically underfunded research institutions and universities in the South, and by encouragement of conferences and workshops with regional themes in developing countries (Western 2003). Expanding the exchange of information and ideas between urban and rural areas, as demonstrated, for example, by the M. S. Swaminathan Research Foundation (Information Village. 2001. Available from http://www.mssrf.org), would also enrich conservation approaches and institutions.

Overall, we need to pay more attention to the *practice* of conservation than to what needs to be conserved. Our technical abilities and knowledge have outstripped our ability to recognize and support the social structures necessary for the practice of conservation. Many different approaches may work under different local conditions, but the common denominator among successful approaches should be the strengthening of an institutional framework that is flexible, that promotes the flow of information and networking, and that takes into account human and social concerns as a significant part of the overall strategy.

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