Community-based Conservation

Is it More Effective, Efficient, and Sustainable?

RESOURCE MANAGEMENT

ECONOMIC COSTS & BENEFITS

SOCIAL & COMMUNITY IMPACTS

BIODIVERSITY CONSERVATION

SUSTAINABILITY ANALYSIS

Summary of Scientific Evidence Relating to Community-based Conservation

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Credits

This report was prepared with funding from the Gordon and Betty Moore Foundation. It comprises a literature review of community-based conservation and four case studies. Future Generations teaches and enables a process of equitable community change that integrates environmental conservation with development. The Future Generations Graduate School offers a Master's Degree in Applied Community Change and Conservation to development and conservation practitioners from around the globe. To learn more, please visit: www.future.org.

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Introduction

Perhaps roughly ten percent of the planet remains an unpeopled "grand treasure" suitable for the set-the-land-aside approach, but how do we protect the remaining ninety percent?

This paper offers an analysis of current thinking and trends in community-based conservation that draws from the scientific literature.

Context

Nature conservation has, until recently, usually been defined as setting aside "wilderness." The epic battle over the Hetch Hetchy valley fought by John Muir and Gifford Pinchot, which resulted with humans winning and nature losing, should have been a warning, but instead it hallowed a pattern of confrontation and set the standard of separation. Conservationists framed the battle as a choice between wilderness protection or its destruction, and the nuanced options of win-win for both sides were for the last half century mostly unexplored. This paper presents a now growing understanding of those participatory options, presented through evidence from a global search of peer-reviewed literature and the development of four case studies.

For a century, nature protection efforts have focused on separating the pristine from the peopled by setting aside national parks and preserves. While many important landscapes have been preserved through this effort, especially the world's grandest places, as William Adams points out, it also grounded nature conservation's origins in the "colonial mindset" (Adams and Mulligan 2006). Local ownership was excluded and control given to a distant power base. For much of this century, preserving nature often resulted in the forced removal, both physically and rhetorically, of indigenous groups who had lived for generations on lands purported to be "untouched" by human encroachment. There was an urgent need for conservation action given the rampaging invasion threatening the world's greatest treasures—today protected landscapes are evidence of that hard work. With the beginning of this century, however, an awareness has grown that protection also requires the involvement of people on a planet that is now peopled to a dangerous level. Perhaps roughly ten percent of the planet remains an unpeopled "grand treasure" suitable for the set-the-land-aside approach, but how do we protect the remaining ninety percent?

In protection strategies, recent decades have seen an evolution of approaches that involve communities and local people. This maturation has paralleled new understanding of the dynamics of ecology, where Nature is now recognized to be dynamic, changing, with man a part of part of, not separate from, an integrated whole (Botkin 1990). Community-based conservation spans a wide array of approaches that share the dual beliefs that involvement of communities living in the area to be protected is more ethical and also more effective.

Community-based conservation burst into the center of the global conservation discourse at the October 1982 World National Parks Congress, held in Bali, Indonesia. Recommendations from this conference challenged the accepted conservation practices of that day, the model often referred to as the "Yellowstone model" growing out of the National Parks system of the United States. This model was structural in orientation, and centered on:

defining the perimeter of what should be protected; monitoring status inside through science, perhaps flexing the perimeter to include ecosystem connections; then defending the perimeter from encroachment through a balance of incentives and disincentives. This is an approach well suited for uninhabited landscapes; or, as in many U.S. National Parks, where indigenous rights were flagrantly disregarded. But by 1982 there were few remaining uninhabited landscapes, and the ethics of exploiting cultures for ecosystems was being increasingly challenged.

To find a solution, the Bali Conference started by defining the global conservation challenge, through looking at the planet as a series of interconnected terrestrial, marine, and atmospheric systems. It reviewed established protected areas, the threats to them, and the then-unprotected areas, including the vastness of Antarctica. It noted the unsettled tracts of land on every continent and in many countries, giving high priority to securing these remaining wild lands. After strong debate, with one contingent (from mainly Westerners) arguing for the creation of more "Yellowstones," the recommendations that were adopted shifted conservation strategies very pointedly toward people. Traditional societies were to be part of the solution, instead of being seen as its problem. Recommendations were advanced to provide development assistance for these people living in and adjoining priority conservation areas. Voluntary and also participatory conservation action was to be promoted in partnership with government action, and management was to adopt a biosphere reserve approach, where management practices appropriate for ecosystem needs classified zones according to land use (World National Parks Congress 1982).

Immediately, a surge of enthusiasm spread worldwide for community-based conservation. Experiments began. Countering this surge of hope has now recently been a rise in skepticism, skepticism both from the conservation side and from the community development side. Many conservationists, often those charged with managing existing refuges, tend to agree with Alan Rabinowitz, who stated that, "many of the theories popular today, which claim to have a blueprint for how wildlife conservation should be carried out—concepts such as sustainable use, community empowerment over protected areas, and integration of conservation and development—have proven largely unsuccessful in accomplishing their mission. Why? Because they often place people first, even in the last refuges set aside for vanishing species of wildlife" (Rabinowitz 2003).

Skepticism from traditional peoples has often been even more pointed, and couched in such fear that the voices speak anonymously. "What are the international conservation NGOs teaching us in PNG [Papua New Guinea]; one of the few places left on earth where the indigenous people still largely control their land and its resources? They are not empowering people to take full responsibility for the use or misuse of their resources. Instead, they are disempowering the people, by absolving them of the hardest responsibilities.

"There, there, we'll do it for you," is the unspoken phrase" (Anonymous Essay 2003).

Observers who try to view the situation from both sides, such as Mac Chapin, also come up with disturbing conclusions: "Discussions of 'natural' alliances between conservationists and indigenous peoples and the need to work closely with local communities, common just a few years ago, has largely disappeared." And then a page later, "The fact is that indigenous peoples and conservationists have very different agendas. Indigenous agendas almost invariably begin with the need to protect and legalize their lands for their own use….The conservationist agenda, by contrast, often begins with the need to establish protected areas that are off-limits to people." Chapin, who unfortunately builds his case from allegations, not solid evidence, goes on to ask, "How should co-management arrangements be established for lands and waters where one set of relationships to land—the aboriginal—have been built around the normative values of equity, cooperation and reciprocity that is expressed in terms of local authority and common property access arrangements, while the other set of relationships to land—those regulated by the state—have been built around the normative values of competition, exclusive rights to property/resources, and centralized management authority?" (Chapin 2004).

Purpose

Against this highly charged debate—where one near-uniform weakness is that all argue chiefly from opinions, not evidence—this paper offers an analysis of current thinking and trends in community-based conservation that draws from the scientific literature. It is written to inform the Moore Foundation of the global literature in community-based conservation to help Moore Foundation management understand the issues.

Through a review of current academic literature, combined with specific case studies of community-based conservation, this report distills components for success as well as challenges facing community-based conservation. Five major areas are addressed in this paper:

- Resource management. Are resources being effectively managed and what management approaches are being used?
- Economic costs and benefits.
- Social and community impacts. What are the social costs and benefits that accrue to a community that embraces this approach?
- Biodiversity conservation. Are community-based approaches to conservation really protecting and enhancing biodiversity?
- Sustainability analysis. Are community-based approaches to conservation sustainable, and what issues of management or governance threaten its continued success?

The paper first draws out of the peer-reviewed literature the major themes broadly evident worldwide from publications in English during the last five years. The second part of the paper is comprised of four case studies (marine fisheries in the Pacific Northwest, wildlife management in Botswana, ecotourism in Guatemala, and community forestry in Nepal). These case studies dig deeper into issues related to community-based conservation, and they examine in detail community-based approaches to conservation as they are being applied in different environmental, cultural, and political settings.

The third section synthesizes the literature review and the case studies for trends in community-based conservation. Concerns of sustainability become apparent in this comprehensive analysis of the issues as well as best practices now being used to in community-based conservation programs. This analysis also incorporates lessons drawn from the authors' decades of professional work in the United States and international settings in community-based conservation. The final section of this paper is an appendix that gives an annotated bibliography of the reviewed literature.

What this Paper Is Not

At the outset it is important to recognize that two approaches can be broadly used with community-based conservation, "traditional tribal" or "modern science-based." In discussions with the Moore Foundation, it was decided to focus on the modern science-based approaches, where governing authorities work in partnership with communities to protect designated geographical areas.

Similarly, with advice from the Moore Foundation, this paper does not consider community-based conservation in the form of societal-wide conservation movements (Earth Day, Green Long March in China, bottle bills, controlling ozone, etc.), focusing rather on protected areas and programs both for the land and the sea.

Finally, this paper is written as an educational document, to draw out key points related to the successful implementation of community-based conservation projects and programs. The paper is not intended to make policy recommendations to the Moore Foundation.

The Gama Valley of the Qomolangma Mt. Everest National Nature Preserve, among the first protected areas in the world without wardens.

LITERATURE REVIEW

Community-Based Conservation Trends and Issues *

Community-based approaches offer a useful counter to the capacity limits of other approaches, especially in situations where rapidly expanding populations and limited resources make the creation of classical protected areas unlikely.

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Community-Based Conservation Trends and Issues

This review of community-based conservation literature offers insight into the dynamics of this moment and its problems. It identifies four key themes that repeatedly appear in the published research. First is the importance of understanding community. Simplistic definitions of community and an unwillingness to address key social issues can doom a community-based project to failure. Second is the issue of benefits and costs. To expect buy-in from communities, they must perceive the benefits—direct economic, indirect developmental, and social or cultural—as greater than the costs of conserving resources. Third is the theme of community capacity. Community-based conservation can lead to an enhanced capacity of communities to control their own destinies. On the other hand, with no shortage of good will or intentions a lack of developed community capacity can lead to conservation failures, due to the inability of communities to hold up their part of the conservation bargain. Finally, there is the issue of context. Each community exists within a historic and social context. Every community exists within a national and global context. Success in community-based conservation requires recognizing the contextual constraints and opportunities inherent in the meta-matrix of human society. Through these four themes, we will offer a comprehensive portrait of the state of community-based conservation research, the challenges this approach to conservation faces, and the opportunities it provides.

The Community in Community-Based Conservation

Community-based conservation is not possible without an understanding of the term "community." This section is an overview of research on internal community dynamics and the complexity of defining "community." The central issue that emerges from the research surveyed is that **"community" cannot be understood as a monolithic whole or uniform entity.**

One of the perceived benefits of community-based conservation is that, because it entails a more equitable and democratic treatment of community members, it is more ethical than classical approaches to conservation. It is also more effective, thanks to the improved community attitudes toward conservation that it engenders (Mbaiwa 2005). This view is particularly evident in studies that emphasize community empowerment as the most important factor in success (Kull 2002). Numerous authors point out the equity concerns relating to gender, ethnicity, and socio-economic status within the community.

A key dynamic identified in many studies is gender. Arya (2007) argues that community-based watershed projects in India "failed to take into consideration the imbalance between men and women's ownership rights, division of labor and income," and that the full participation by women means more than simply their numerical presence, but also their ability to assert their specific needs and values. Enabling participation by women often requires overcoming obstacles, such as a frequent lack of formal education among women (Mukadasi and Nabalegwa 2007). The importance of empowering women has been noted in conservation projects within diverse contexts (Aswani and Weiant 2004; Budhathoki 2004; Resurreccion 2006). Greater gender equity, meanwhile, does not only benefit women, but has been shown to increase "collaboration, solidarity, and conflict resolution" (Westermann et al. 2005).

Other studies focus on issues such as ethnicity, caste, and social status. For example, caste privilege has presented an obstacle to the shared benefits and shared participation in community-based conservation projects in Nepal (Jones 2007). Dzingirai (2003), meanwhile, points out that community benefits from wildlife in the Communal Areas Management Program for Indigenous Resources (CAMPFIRE) in southern Africa are restricted to "producer communities," which share territory with wildlife and are often defined in ethnic terms, leading to the exclusion of immigrants and neighboring groups. This can cause resentment and antagonism toward conservation in the populations and communities that fail to benefit from the conservation effort. Similar dynamics have been noted in other contexts where conservation incentives are perceived to be lucrative (Lu et al. 2006).

Socio-economic differences, often related to gender and ethnic issues, are a determining factor in community participation in the conservation effort. King (2007), for example, notes that socio-economic status had a direct impact on people's perception of a game reserve in South Africa. Neilsen (2006), meanwhile, found that those arrested for illegal hunting in Tanzania were the poorest and most protein deficient of local people.

Several studies have examined the role of specific institutions in embodying the community voice. In one case, young people did not participate in tribal associations engaged to be the community's voice, highlighting a problem with associating "community" too closely with traditional structures (King 2007). Sheikh (2006), on the other hand, points to the importance of engaging religious institutions in conservation efforts in Pakistan in order to cultivate community support for conservation. An approach that many projects have taken is that, rather than attempting to involve the community as a whole, certain groups or participants are

recruited from the community to work with a project. In some cases, these are recruited as guards, as in the case of Bedouin guarding sites of both environmental and cultural preservation in Sinai (Grainger 2003) or the Village Game Scout program in Tanzania's Serengeti (Holmern et al. 2007).

The very existence of a "community" should not be assumed, nor should its continued viability. Instead, Bryden and Geisler (2007) suggest, community-building and strengthening should be incorporated as a goal in and of itself in community land reform and related projects. Another important issue is community size, as "small community population" has been proposed as a necessary factor for successful community-based resource management (Beger et al. 2004; Horwich and Lyon 2007). Other studies cite "community complexity" as a key factor influencing success (Crawford et al. 2006), given that variation among communities means variation in almost all factors relating to conservation projects, from institutional capacity to definitions of nature and change (McCallum et al. 2007). To deal with these issues Raik and Decker (2007) emphasize the need for an analytical framework to differentiate community from outside interests and situate multiple interests within the community, while Spiteri and Nepal (2006) point to the need for a "holistic" definition of community including efforts to include marginalized groups.

Community in Context

Neither communities nor community-based projects exist in pure isolation. As Tsing (2005) emphasizes, local empowerment can only be understood in a state of "friction" with global dynamics. A study from the Philippines found that community-based resource management and conservation cannot be understood without taking into account "the overlapping roles of government and nongovernmental organizations (NGOs); and multiplex relationships of NGOs with local communities" (Austin and Eder 2007). The importance of interaction with NGOs even in cases where practices are essentially traditional has also been noted (Gray et al. 2007; Johannes 2002). Similarly, Blaikie (2006) calls for "greater interface" among donors, governments, and participants in community-based natural resource management projects. Taylor-Ide and Taylor (2002) articulate this as the need for a "three-way partnership" between the community ("bottom-up"); government or authority structures ("top-down"); and NGOs, practitioners, and researchers ("outside-in").

Within the context of science and the environmental movement, Berkes (2004; 2007) argues that community-based conservation must not be viewed as a "panacea," but rather needs to be integrated as one part of a broader "interdisciplinary science of conservation." Sayer and Campbell (2003) call for a disciplinary integration into a

new science of conservation and development, which they see as akin to Aldo Leopold's "integrated science of landscape management." Integration and exchange among forms of knowledge has been cited as a key aspect of successful community-based conservation projects (Drew 2005; Fraser et al. 2006). Such fusions need to involve actual discussions among multiple groups, rather than simply being gestures toward multiple epistemological frameworks (Githuru and Lens 2007).

Other studies emphasize the need for a "context-sensitive" analysis, to account for the wide range of "causal influences" (Agrawal and Chhatre 2006). It has also been argued that "place specific socio-environmental contexts" place their distinct stamp on projects' design (Wilson 2006). Klein et al. (2007) emphasize the importance of attention to local context and suspicion of "politically correct" discourses applied too broadly. Instead, **social and political issues must be understood at the local scale** (Myers, 2002). Vasseur and Hart (2002) point to the importance of finding ways of working across political systems, and Virtanen (2003) takes this to the point of questioning the broad applicability of individual successful cases.

Temporal and historical context is also important, an idea developed in Adams' and Mulligan's (2006) edited volume, which situates current conservation goals in a context of past colonial relationships. Several studies have recognized the problems with equating "community" with traditional structures, or of assuming that traditional practices will continue without support and organization (King 2007; McConney and Baldeo 2007). Khumbongmayum et al. (2005), for instance, found the erosion of taboos that had maintained high levels of biodiversity in sacred groves in India. Sheikh (2006), meanwhile, emphasizes the importance of including religious leaders in conservation in Pakistan. Tompkins and Adger (2004) raise the possibility of global climate change bringing about hitherto unknown conditions and the strains this might place on decision-making processes based on community experience.

Another contextual theme that appears regularly in the literature is a distrust of government and outside bodies on the part of community members, often disserved due to the dysfunction of governing or outside bodies. Many studies reference community distrust of government, donors, or NGOs (Campbell et al. 2007; Mallory et al. 2006; Tucker 2004). Others seem to justify that distrust, as in Zimbabwe, where a model of success of community-based conservation in the CAMPFIRE program deteriorated due to national turmoil and a breakdown of government oversight (Balint and Masinya 2006). Similarly, Brockington (2007) argues that village forest reserves in Tanzania have been compromised by the "corrupt and violent" malpractice of local government and the "predatory relationship between village government and the central state and district governments." Even in less disrupted settings, lack of government support for community action has been cited as an obstacle to successful community-based

conservation (Granek and Brown 2005; Holmern et al. 2007; Marschke and Nong 2003; Salam et al. 2006). Xu and Melick (2007), meanwhile, cite similar problems in China's formally protected areas, but suggest that community-based approaches are an alternative less susceptible to governmental dysfunction.

Benefits and Costs of Community-Based Conservation

Community-based conservation holds the promise of a win-win situation, in which both conservation and community development goals are achieved. For projects to make any headway, active community participation is required, so **the benefits to the community must be clear.** Many studies have explored the effectiveness of community-based conservation, particularly through ecotourism, community forestry, fisheries, and other "harvest-based" initiatives, both in providing tangible community benefits, and in enabling conservation. Skeptics, however, point out that despite promises, many ecotourism, trophy-hunting, and community-based conservation schemes around the world have not been rigorously evaluated (Woodroffe et al. 2005). The problems caused by a lack of perceived community benefit have been well documented. West (2006), for instance, documents the disconnect between the goals of NGO workers and community members in Papua New Guinea; where NGO workers sought to instill valuation of biodiversity as an economic benefit, while community members expected benefits such as medicine and technology.

One of the most common claims in community-based conservation research is that for projects to be successful they must offer **benefits to the community to offset the expected demands and sacrifices** (Adams et al. 2004; Budhathoki 2004). Many studies have noted the direct correlations between community attitudes toward conservation and perceived community benefit in material terms (Baral and Gautam 2007; Beger et al. 2004). A study in Nepal revealed support for tiger conservation among poorer community members, those that could not afford to own livestock, whose livelihoods were unaffected by occasional losses to tigers. On the other hand, there was widespread skepticism toward conservation measures that denied those same villagers access to forest products (Arjunan et al. 2006). Another study offers an "index of tolerance," suggesting that community members are willing to lose more livestock to wildlife before retaliating, if they received benefits from tourism or trophy hunting, and if they owned land (Romanach et al. 2007). Other studies cite government-funded development incentives as the most viable means of providing a community benefit and building community support (Lu et al. 2006).

In many cases, community benefits are less direct. In a study of the Annapurna Conservation Project in Nepal, only 14.9 percent of respondents reported direct

income from tourism, while 84 percent reported loss of crops or livestock to wildlife. Nevertheless, support for the project was high due to the infrastructure and services it brought (Bajracharya et al. 2006). Similarly, Balint (2006) argues that community-based conservation will be more effective if it incorporates a broader view of development variables. This kind of approach can also be seen in studies measuring community benefits through noneconomic factors, such as child nutritional status (Gjertsen 2005). A survey-based study by Kideghesho (2007) found education level as the single greatest factor influencing community perception of the Serengeti National Park. Susilowati and Budiati (2003) also found that in Indonesia, formal education was a key factor in community participation, suggesting that even when not directly linked to conservation initiatives, community development, including building schools, can improve attitudes toward conservation. In these and other studies participation in community-based conservation has been linked to rising social capital (Becker et al. 2005).

One of the most widely promoted strategies to derive financial gain for local communities from conservation is through ecotourism, especially for projects that focus on protecting dramatic wildlife that attracts visitors (Cardenas-Torres et al. 2007; Rowat and Engelhardt 2007). Tourism has long been an economic boon to parks, but often local communities have not seen those benefits. However, even in areas where it has yet to show real revenue, studies have revealed high local hopes for ecotourism benefits (Stone and Wall 2004).

Ecotourism programs do provide income, both for conservation initiatives and for the local population, but as numerous studies reveal, the income is not always sufficient to offset the sacrifices. In Uganda, the tourism revenue from mountain gorillas was insufficient to assure gorilla conservation, and did not fully outweigh the costs of park creation borne by the local population. (Adams and Infield 2003). A similar study in Namibia found the costs of effective conservation too high to be covered by the income generated from ecotourism and trophy hunting (Vorlaufer 2007). Another study, meanwhile, found that while CAMPFIRE (an initiative that includes both ecotourism and sustainable "cropping" of wildlife) had created employment and infrastructure, and was thus viewed positively, community members reported little change in their livelihoods due to the project (Mutandwa and Gadzirayi 2007). Ecotourism can also come into conflict with other forms of economic gain, as in community fears that tourism would impact the harvesting of sea turtle eggs in Costa Rica (Campbell et al. 2007). Ecotourism has also come under fire for not living up to the "eco" aspect of its name, as in a study of the Komodo National Park in Indonesia that suggests that "ecotourism" simply provides a politically attractive cover for exclusionary conservation (Borchers 2004).

Another of the most widespread efforts at providing community benefits is through community forestry (Menzies 2007). Community forestry has been shown to be promising in studies ranging from conceptual analysis (Charnley and Poe

2007), to an analysis in Mexico that found community managed forests to be competitive entrepreneurial enterprises (Antinori 2005). In Nepal, twenty years of community forestry projects were found to have led to a collateral increase in privately owned trees, harvesting of forest products, and a decline in environmentally destructive animal husbandry (Adhikari et al. 2007). Mexico's success in community forestry is telling given that much of the country's forests have been in community hands since the Mexican Revolution (Bray et al. 2003). Meanwhile, Thang et al. (2007) explore the importance of creating partnerships with donors and NGOs in generating community forest incentives in Vietnam. Another study explores the possibility of expanding "Fair Trade" certification for community forestry produced forest products (Taylor 2005).

A key issue raised by many studies is that local perception of species of value may not coincide with conservationists' views. The local perception of a "healthy forest" is likely to be based on useful species rather than biodiversity (Lawrence et al. 2006). This emphasis on useful species does not, however, preclude biodiversity and healthy forest succession (Kijtewachakul et al. 2004). A study that found great biodiversity in sacred groves in India points out that 96 percent of the species had some medicinal value (Khumbongmayum et al. 2005). A study of participatory management in South Africa, meanwhile, found that community priorities were directed more toward securing rights to, and equitable benefit from, a dwindling forest resource base, rather than concern for the sustainability of future yields (Robertson and Lawes 2005).

Another "harvest-based" approach is culling of wildlife herds. A sustainable number of animals are harvested to provide the community with income, meat, and other animal products. One project studied created "hunting zones" where community members could both hunt and lease sport hunting rights (Usongo and Nkyanje 2004). Such sustainable harvest projects require sufficient monitoring to ensure that harvest levels are in keeping with conservation goals (Du Toit 2002). A study of the viability of this approach in Tanzania found that relevant species were too depleted for sustainable yields, and that illegal hunters were the poorest members of the community. The author argues that conservation efforts should instead focus on expanded access to domestic animals (Nielsen 2006). Another study of a game cropping program in Tanzania found that it was costly and inadequate, as illegal hunting still provided most community protein needs (Holmern et al. 2002; Loibooki et al. 2002). A marine example of where sustainable harvest has proven an effective incentive is paying villagers for turtle eggs [for hatchery rearing], providing a de facto market that creates an incentive to protect adult turtles (Caputo et al. 2005).

A key factor in the success of many harvest projects is the recognition of traditional noneconomic incentives. An example from New Guinea shows how

hunting of fish on a protected reef for ceremonial purposes protects both the fish and enables the continuation of important ceremonial practices (Cinner et al. 2005).

Another potential issue with community incentives is in ensuring the equitable distribution of benefits. The benefits from wildlife conservation, both in terms of tourism and limited harvesting, can lead to problems with the exclusion of certain groups perceived to be "outsiders" (Dzingirai 2003). The restriction of benefits to privileged groups within the community has been identified as a key weakness in many incentive-based projects (Spiteri and Nepal 2006). Similarly, while poverty alleviation is the stated goal of many community forestry projects, some studies reveal their susceptibility to manipulation by local elites, or to misguided donor stipulations (Sunderlin 2006). Despite claims that communities will benefit in "win-win" situations, it has also been argued that communities will do better if they instead take a more advocatory approach to their own interests (Fay 2007).

Community Capacity

Alongside allegations that communities will simply not genuinely participate in conservation—the "fox will not guard the henhouse" argument—perhaps the most common source of skepticism about community-based conservation is the question of community capacity. Are communities in fact capable of being active partners in conservation, and if so what tools and support do they need?

An important factor in building community capacity is linkages with outside groups and technologies. One study in Nepal found that community capacity was hindered when delegation of responsibility to the community level was not matched by delegation of property rights and power (Nagendra et al. 2005). A similar study argues that while people in Thailand have been practicing sustainable forest management for generations, the government does not recognize community forest management, which prevents institutionalization and transfer of appropriate technology to the community level (Salam et al. 2006).

Among strategies for increasing community capacity, **many studies call for attention to building community institutions** (Bawa et al. 2007; Tucker 2004). In the Solomon Islands, Aswani and Weiant (2004) note the importance of community in a "marine tenure system that allows for the project's development and the area's policing." Another study found that, for both conservation and development goals to

be met, outside groups should focus particularly on the conservation goals while institutions internal to the community are too weak to do so (Tai 2007).

Adaptive capacity, the ability to react dynamically to changes and unexpected developments as projects go forward, has been identified as key to the success of community-based conservation projects. Part of this arises out of developments in ecological science and the recognition that ecosystems are not inherently stable, but are complex adaptive systems (Berkes 2004). This state of flux is only likely to increase with instabilities and hitherto unknown conditions brought about by global climate change, heightening the need for adaptive capacity at the local level (Tompkins and Adger 2004). Armitage (2005), for instance, points to adaptive capacity as a conceptual weakness of many projects. A study of community capacity, meanwhile, emphasized adaptive capacity as key to the "adaptive manager" (as opposed to "powerless spectator") in communities most successful in managing their own projects (Fabricius et al. 2007). Another survey found "adaptive co-management" and "learning by doing" to be the key features of effective community programs (Marschke and Nong 2003). Taylor-Ide and Taylor (2002) address this need for adaptation through iteration of identifiable tasks.

One of the most widespread claims, and areas of research, about the capacity of community-based conservation lies in the status of so-called "traditional" knowledge (sometimes "traditional ecological knowledge" or TEK). Becker and Ghimire (2003), for instance, argue that **"synergy" between traditional ecological knowledge and science is key to conservation success.** The local specificity of TEK has been identified as a key contributor to conservation success, especially when exchange with researchers enables community members to integrate it into a "scientific infrastructure" (Drew 2005). In addition to its local specificity, TEK has been shown to offer a longer temporal window, but is less effective in relation to populations at large, which often reach beyond the purview of individual tribes or communities (Fraser et al. 2006). Other studies have suggested that TEK is primarily useful in filling the gaps in available scientific research, but should not substitute for "sound science" (Granek and Brown 2005). In addition to being useful in and of itself, **incorporating indigenous knowledge can be a useful empowerment strategy, and help to overcome distrust of government and outsiders** (see "context" section) (Mallory et al. 2006).

Community capacity is also apparent in monitoring and enforcement. **Communities have been found to be particularly effective at enforcing locally determined regulations** (Crawford et al. 2004). In Tanzania, village game scouts were found to be particularly effective in arresting illegal hunters, but were hampered by a lack of resources and inadequate links to formal law enforcement (Holmern et al. 2007). For projects based on sustainable yield harvesting, communities must have access to effective monitoring strategies to ensure the sustainability of harvest levels (Du Toit

2002). Community skills such as tracking and fishing can be incorporated into projects as a useful approach to monitoring (Martin and James 2005). Participation in monitoring programs over time has also been linked to increased conservation knowledge among community members and hence to increased capacity (Tran 2006). The difficulty of effective monitoring means that it is often beyond the resources of either communities or scientists, leading some researchers to suggest that in addition to finding new means of low-cost monitoring, "negotiated moratoria" on harvesting may be necessary even in the absence of complete proof that a resource is overexploited (Hockley et al. 2005).

In discussions of funding community and scientific knowledge and monitoring strategies, particular attention has been given to the potential role of geographic information systems (GIS) technology. Often, needs are too pressing for full scientific evaluation. In such cases traditional knowledge, especially when integrated with science using GIS, can provide an effective tool for monitoring (Balram et al. 2004). Incorporating indigenous knowledge into GIS has been suggested as a means of "bridging the gap between indigenous and Western cognitions of seascapes" (Aswani and Lauer 2006). Furthermore, through incorporating traditional and scientific knowledge, GIS can move from being a means of representation and become a synthesizing and problem solving tool (Mersey et al. 2002). GIS has also been posed as a tool for empowering community action (Wood 2005).

The capacity of communities to be effective conservation partners can be questioned, but it is also important to keep some perspective on the capacity of classical conservation approaches. One study that compared "conventional" and community-based conservation strategies in terms of their ability to mitigate environmental threats found community-based approaches to have a slight advantage in mitigating "logging, bush burning, encroachment and unclear boundaries," but that both approaches mitigated less than 50 percent of identified threats (Mugisha and Jacobson 2004). Another study compared bird species in the Tembe Elephant Park in South Africa with a plot of land set aside for conservation by an adjacent community and found greater biodiversity in the community plot (Van Eeden et al. 2006). In addition, community-based approaches offer a useful counter to the capacity limits of other approaches, especially in situations where rapidly expanding populations and limited resources make the creation of classical protected areas unlikely. (Chen et al. 2005). Furthermore, Baral and Gautam (2007) note that building community capacity takes time; in the case of Nepal's successful Annapurna Conservation Area Project (ACAP) nearly a decade was needed, suggesting that some critiques have simply been premature. The aforementioned success of Mexico's community forests over the past century, for instance, is indicative of the capacity of such programs for long-term sustainability and competitiveness (Antinori 2005; Bray et al. 2003).

Adams River Sockeye by Jeffery Young/David Suzuki Foundation

PACIFIC SALMON CASE STUDY

Place-Based Management of Salmon in the Pacific Northwest *

It is probably no exaggeration to say that there is a worldwide crisis in resource management. There is certainly a crisis in resource management science. (Holling et al. 2000)

As one important fishery after another declines, there is a clear consensus that current fisheries management practices are not working well. (Acheson et al. 2000)

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Context

The worldwide failure of fisheries management is now widely recognized (Berrill 1997; Clover 2006; McGoodwin 1990; Myers and Worm 2003; Pauley and Maclean 2003; Roberts 2007) and the scope of the failure suggests a systemic problem in the basic approach or the conceptual foundation of fisheries management. An inadequate conceptual foundation has been tied to management failures in as biologically and geographically different fisheries as Pacific salmon in the Pacific Northwest and the Northern cod stock off Canada's east coast (Bottom 1997; Finlayson 1994; Frissel 1997; Williams 2006). The widespread collapse of important fisheries has created a crisis, which may have opened the opportunity for fundamental conceptual and structural change in fisheries management (Holling 1986). Finlayson and McCay (2000) state it this way:

…*when the accumulation of perceived failures significantly exceeds the perceived utility of management, the legitimacy and conceptual coherence of that management are weakened to the point where they are vulnerable to challenge and open to fundamental change.*

One of the changes currently underway in the Pacific Northwest in response to the massive extinctions and depletion of Pacific salmon is the emergence and the growing strength of community-based conservation efforts by local watershed councils.

Community-based management of fisheries resources is not new to the Pacific Northwest. Native Americans practiced a form of communal conservation and management of local salmon and shellfish stocks for at least a thousand years or more before the arrival of Euro-Americans (Lichatowich 1999). The native American culture and economy coevolved with the developing forests and salmon runs as the latter recovered from the Wisconsin ice age. The salmon's life history made them particularly suited to place-based management by local tribes.

Adult salmon return to their natal stream to spawn, and the resulting juveniles remain in the home river for a few weeks or months to a year or in some cases longer. Repeated spawning of the geographically isolated populations of salmon in different rivers leads to distinct salmon populations that are highly adapted to their home stream's habitat and environmental characteristics. Once they enter the ocean, the salmon range across the North Pacific Ocean in mixed aggregates of populations from different rivers. When the salmon mature, the distinct populations begin separating and the adult fish home back to the streams where they spawn. Salmon are place-based animals. They are tied to specific rivers and specific parts of larger watersheds where they carry out the important acts of reproduction and early juvenile rearing. Native American tribes are also tied to specific local places and rivers. This common trait led to the coevolution of a place-based

relationship between the salmon and local tribes.

With the immigration of large numbers of Euro-Americans into the Pacific Northwest, the fishery and the structure of salmon management underwent rapid change. Fisheries that initially targeted local salmon stocks, by harvesting in rivers, moved to the ocean in the early decades of the twentieth century. This shift was facilitated by the development of motorized fishing vessels that greatly expanded the range over which the fishermen could hunt the salmon. Salmon harvest was no longer on local stocks in their home rivers, but on mixed aggregates of stocks in the ocean; an aggregate of stocks that most likely had originated from several rivers. This fundamental change in the fishery coincided with the movement toward centralized resource management by bureaucracies filled with technical experts (Hayes 1969). Fisheries were managed with uniform regulations that covered large areas and several stocks regardless of the productivity and status of the individual stocks within the management areas (Thompson 1965). Place–based community management was replaced by a placeless management characterized by centralized control, large bureaucracies of technical experts, and a heavy reliance on technology (hatcheries) to circumvent the need for local habitats.

The Native American tribe living on a river knew when the salmon run was strong or weak. Their standard of living was directly related to the strength of the run. One consequence of the shift in salmon management from the local community or tribe to a centralized bureaucracy was that the individual, locally adapted salmon populations received little attention. The individual populations and their status were invisible, below the "cultural radar" of the management institutions. The great salmon biologist W. F. Thompson summed up the consequences of this shift in management perspective in a paper just before he died in 1965. After describing the importance of understanding how salmon populations are adapted to their local habitats, Thompson (1965) describes the consequences of ignoring the importance of local populations of salmon:

But we do not know much about these independent, subspecific groups of salmon segregated during spawning, and so we do not know just how to conserve the numerous kinds that exist. In our fisheries, we have been accustomed to dealing with mixtures of many of these units, although each has it own particular requirements. … We can only moderate our ruthless fishery, blindly and in partial fashion; we cannot avoid its effects completely. … knowing only that our total catches diminish, as one by one small populations disappear unnoticed from the greater mixtures which we fish.

Of course, the problem was not just harvest. The same mindset that led to the overharvest of local stocks of salmon also led to the destruction of the habitats those individual salmon populations depended on. As a result, Pacific salmon are now extinct in at least 40 percent of their historic range and the salmon in most of the remaining range are under the protection of

the federal Endangered Species Act.

This condition has led to the reemergence of place-based community management of Pacific salmon. The term "reemergence" of community-based management applies to the Euro-Americans. Native American tribes never did give up community-based management, but it has only been in recent years that the Tribes have attained co-management status with state and federal agencies.

Participatory Resource Management System

The reemergence of place-based management through a watershed approach suggests a special and intimate relationship between people and their local salmon run. Citizens in the Pacific Northwest are not satisfied with the persistence of salmon in the abstract or in faraway places like western Alaska. They are refocusing attention back to the local salmon run in the nearby watershed. An important expression of this shift has been the recent emergence and rapid growth of watershed councils. There are now 153 watershed councils in California, 159 watershed councils in Oregon and 103 watershed councils in Washington (Salmon Nation 2008). Watershed councils are legal nongovernmental entities under Oregon law (Oregon revised statute 541.338) that are provided legal protection and that are eligible for state and federal financial assistance. Oregon defines a watershed council "…as a voluntary, local group that represents a balance of interests and affected persons in a watershed." In general, watershed councils describe a community-based group made up of local citizens with diverse interests that takes a watershed approach to managing natural resources using collaborative partnerships between public and private sectors. Watershed councils often use a consensus approach to decisions (Huntington and Sommarstrom 2000), and are an example of what Barber (Prugh et al. 2000) refers to as "strong democratic" institutions.

At least one foundation that supports watershed restoration programs has also recognized the importance of a community-based approach. The Bonneville Environmental Foundation requires a strong support from and involvement of the local community as one of its key criteria for long-term financial support (Reeve et al. 2006).

At the current time, watershed councils are primarily focused on watershed analysis and salmon habitat restoration activities. Since the activities of the watershed councils are tailored to the problems of an individual stream, those activities can vary widely. The councils replace road culverts that block salmon migration, replant native vegetation in riparian zones, add habitat structure in the form of large wood to streams, and conduct community outreach and education. Some community-based restoration groups have also used artificial propagation in their programs. As important as the field work in watersheds, the councils provide a forum for democratic debate and

collaborative deliberation of the variety of issues and the differing ways members of the community define and value watershed health (Moseley 2003).

Although they are widespread and numerous, watershed councils are not the only approach to place-based management that citizens of the Pacific Northwest are exploring. The Hoh River Trust is an example of another approach. The Trust was incorporated in 2004 by two environmental organizations, the Western Rivers Conservancy and the Wild Salmon Center. The mission of the trust is to purchase lands along the Hoh River and to conserve, restore and enhance those lands to promote healthy salmon and steelhead runs as well as provide habitat protection for other species, such as marbled murrelet, spotted owl, bald eagle, and bull trout. The trust is beginning to build bridges to a local community suspicious of the intent of "outsiders." They are working on restoration and monitoring projects with the Hoh tribe and the community of Forks, both of which have a stake in the health of the salmon population. As this relationship develops, the Hoh River Trust hopes to transition into a community run organization, increasingly able to represent the interests of the Hoh River in the management decision process (Davis 2007). These are two examples of a wide variation of organizational structures, funding, programs and approaches to community based watershed management in the Pacific Northwest.

The watershed councils represent an early stage in the evolution of place-based community management. They are at the "participatory" stage of development, having little if any management authority over specific salmon stocks. Pinkerton and Weinstein (1995) describe a continuum of community involvement in resource management. At one extreme is total management by government agencies and at the other end of the continuum total community management. Various forms of comanagement fall in between the two extremes on the continuum. If the two extremes are given numerical scores, for example, one for community management and ten for management by government agencies, most watershed councils as currently constituted would probably have a score of eight or nine. The councils are carrying out some management functions, primarily in the area of habitat restoration, but these activities are guided by the government agencies, which are responsible for most if not all management decisions. Watershed councils have a long way to go to achieve real management authority.

Huntington and Sommarstrom (2000) developed evaluation metrics and conducted an assessment of the effectiveness of fourteen watershed councils. Their review found that watershed councils fill a need for habitat restoration that "cannot be filled otherwise," and in most cases the councils reviewed represented an improvement over the status quo. Several areas that need improvement include: better planning, monitoring and evaluation; adaptive management; improved process for accountability; dealing with intractable

issues; improved access and use of technical and scientific information; and better staffing and funding. Many of the areas that need improvement, monitoring, adaptive management, and planning, for example, may be deficient because of a lack of sufficient funding.

Economic Costs and Benefits

The rapid spread of community watershed councils over the last 20 years is a manifestation of the public's belief that traditional approaches to resource management are failing. For example, in a poll conducted in 2004 by Oregon State University, 65 percent of the respondents believed that moderate or significant changes in current management approaches are needed. The public sees a need for a different approach to resource management because of the well-publicized collapses of fisheries worldwide and also because of a change in the way it values fisheries like the Pacific salmon. For most of the last century, Euro-Americans valued the salmon largely as a commodity—for their economic value. However, in recent years, public values have shifted and this shift is illustrated in the answers to two questions in a poll conducted by the Portland *Oregonian* in 1997. The first question asked: "If you think salmon runs in the Columbia and Snake rivers should be preserved, please say which of the following reasons is most important to you." Eighty-five percent of those polled said that preserving salmon was either very important or somewhat important. Thirty-six percent of the respondents said they want the salmon preserved because they were a part of the Northwest's history and heritage; 35 percent wanted salmon preserved because they are a gauge of water quality and the environment's health; 8 percent responded that they just wanted to know they were there for personal or aesthetic reasons; 9 percent wanted to preserve the salmon for the sport fishery and 6 percent for the commercial fishery. Only 2 percent did not care about preserving salmon runs. The answers were surprising in that the commodity value of salmon was not the most important reason for their preservation. Most of the people wanted the salmon preserved because they valued them for reasons other than their commodity value.

The second question also reflected the shift in values. It asked: "Efforts to improve salmon runs sometimes compete with commercial uses of the Snake and Columbia rivers, such as hydroelectric power generation and the shipping of farm products. In your opinion what should have a higher priority right now." Sixty percent responded that improving salmon runs should have a higher priority and 26 percent responded that commercial uses should have the higher priority. Fourteen percent did not know or did not answer (Brinckman 1997).

The point is that 50 years ago had those questions been asked the answers would have been very different. The economic value of the fishery would have outranked other aesthetic or heritage values and the commercial value

of the river as a transportation route, a producer of hydro power, a source of irrigation water, etc., would have been given a higher priority. The shift in values shown in the poll poses opportunities and problems for the evolution of community-based management of Pacific salmon.

However, place-based salmon conservation efforts are not necessarily at odds with commercial fishing. Those organizations working to enhance local salmon runs, through habitat restoration and other means, often find it in their advantage to promote a native salmon fishery instead of hatchery and industrial fish farming. Organizations, such as Salmon Nation (www.salmonnation.com) bring commercial fishermen in league with sport fishermen and environmental activists as they work toward goals that will benefit the interests of each group.

Social Costs and Benefits

Norton (2005) defines a community's "constitutive values" as those aspects of a place, which if lost "… the integrity of a place—its identity as a place that humans of a particular community call home—is diminished, as is community members' sense of self." The *Oregonian* poll showed that the commodity value of salmon was still important, but there was also a deeper set of values that represent a more fundamental concern for the salmon and their connection to the region's sense of place. This does not diminish the critical importance of harvest and its economic benefits. One of the keys to successful community-based fishery management is that the community is highly dependent on the fishery (Pinkerton and Weinstein 1995), that is, the community has a strong economic motivation. However, to accommodate the broader mix of the ways people value salmon, community-based management must incorporate a diversity of values, interests and points of view (Norton 2005).

An approach to community management of a watershed, and its salmon, and based on a diverse set of "constitutive values" will have to deal with a mismatch between this new approach and the approach of the government management agencies. Centralized and bureaucratic fishery management agencies are primarily concerned with the economic value of the fisheries they manage. In fact, most of the performance measures used by government management agencies are directly or indirectly related to the economic value of salmon (Lichatowich 1997). As was seen with other natural resources, such as the management of national forests, this management approach is out of sync with evolving societal values and desires. This mismatch between the narrowly defined conceptual framework of management agencies (Bottom 1997; Williams 1999) and the broader framework that can characterize a community's "constitutive values" impedes communication and it will make it difficult for communities to convince government agencies to relinquish some of their management authority.

Biodiversity Costs and Benefits

The current approach to salmon management by the government agencies, which focuses on harvest in ocean or lower-river fisheries targeting mixed stocks and a heavy reliance on artificial propagation to supply those fisheries, is antithetical to a focus on local, individual stocks of salmon reproducing in their natal watersheds. In many respects conventional salmon management is placeless. In fact, the management by government agencies under their current approach can negate the efforts of community groups working at the local level by the way distant fisheries are managed or by the centralized (placeless) management of hatcheries and habitat protection. For example, the benefits of restoration efforts in a watershed can be undermined by excessive harvest on the restored stock in mixed stock fisheries

This mismatch between the placeless and the place-based approaches to salmon management is clearly illustrated in northern British Columbia, specifically in the Broughton Archipelago. Salmon management, with its heavy reliance on artificial propagation and hatcheries, adopted an agricultural model of greater and greater human control and manipulation to improve productivity (Bottom 1997). In agriculture the control and manipulation of livestock production reached it apex in the mass rearing of animals in feedlots, variations of which are used to produce beef, pork, and fowl. Since salmon management has paralleled developments in agriculture, it was natural for government agencies to accept feedlot rearing of salmon as progress worthy of support. Salmon farming has grown to be a major source of salmon in world markets. However, it is also recognized that intensive farming of salmon has created problems for wild salmon (Hume 2004). Declining pink salmon runs in the Broughton Archipelago have been associated with the transfer of sea lice from salmon feedlots located along migratory routes of wild pink salmon juveniles. Salmon farms are another form of placeless technology. Many farms use nonnative Atlantic salmon and the farms could exist in many places, including on land. Their salmon are not adapted through evolutionary history to one river or to a home stream. In spite of the mounting evidence of the impact of salmon farms on wild salmon, they still enjoy the support of the government. Salmon feedlots are consistent with a century long belief in the power of technology to maintain the commodity value of salmon. But as A. Morton, a resident of the Broughton, has pointed out (2004), "We are a wild fish-based society, and as go the wild fish, so we go. My community is dying of salmon farming." Broughton is an example of the conflict between a community trying to survive on local, sustainable wild salmon, and the consequences of a placeless approach to salmon management.

A community-based approach to salmon fisheries management will inevitably require moving higher on the scale of local control, with a strategy that

recognizes the productive variability of individual rivers and streams. This approach will enhance the biological diversity inherent in distinct local populations of each major salmon species.

Sustainability Analysis

In *The Local Politics of Global Sustainability* (2000), Prugh, Costanza, and Daley argue that the road to global sustainability will eventually lead through local "strong democratic" institutions. These institutions, such as watershed councils, have the ability to bring diverse interests together to make local environmental decisions that combine to have a global impact. This can already be seen as cities and towns take action on global warming that national governments shy from.

Throughout the Pacific Northwest, watershed councils and other place-based groups, such as the Hoh River Trust and the wild salmon dependent community of the Broughton Archipelago, are working to save, restore, or protect their local salmon populations. These communities, whose members have diverse individual interests, are united by the common purpose of restoring or protecting salmon. If they could look beyond their local issues and focus some of their attention and effort into common problems, they could form the raw material for a social movement, and bring about needed changes in the way watersheds and their resources are managed. This coalescence around common problems has yet to occur. Steele (2006) describes the current situation and its possibilities:

A potential weakness of the Oregon Plan for Salmon and Watersheds is that while it utilizes local watershed councils, it does not necessarily encourage or mandate interaction between these councils that could lead to a larger, more concerted effort. A successful social movement for wild salmon would have to begin at the local level (e. g., watershed councils) and be connected to a much larger national and international network.

The potential is there, but as of today it is still just potential.

Place-based conservation efforts, in their current state, may face several obstacles regarding their potential to evolve into real community-based management. A mismatch between the management approaches of centralized bureaucracies and place-based management of watersheds raises the question, where will the watershed councils or other types of community-based approaches to resource management obtain the scientific and technical information they need to guide their programs? Do they need an independent source of information divorced from the policies and programs of agencies, the policies that have contributed to the crisis in world fisheries?

Can the place-based conservation groups organize into a formidable social movement to resolve their common problems? Could a salmon utility as

proposed by Hawken (1993) organize community groups into a grass roots movement?

Is it possible to develop a set of benchmarks that place-based approaches to resource management must meet to evolve from their current position to co-management and perhaps in some cases full management authority?

Are there additional, immediate steps that can be taken to strengthen the role of place-based groups in watershed management? For example, proposals for development or for zoning changes in the local watershed could be sent to the local watershed council for comment and for discussion before county planning commissions.

Photo by: Kelly Landen of Elephants Without Borders

BOTSWANA
CASE STUDY

Community-Based Resource Management Approaches in Southern Africa: The Botswana Experience *

By putting communities in charge of local conservation and development priorities and encouraging partnerships with the private sector, community-based nature resource management sought to give communities more power to improve conservation and development outcomes.

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Context

During the 1980s and 1990s, conservation policies and agencies in Africa came under severe criticism. In several countries, the evidence of increased poaching in the 1970s and 1980s pointed to the inability of wildlife departments to manage their habitats and wildlife populations. The government departments, critics argued, had relied on top-down bureaucratic approaches that excluded local communities, making wildlife management especially difficult outside protected areas and on private lands (Hulme and Murphree 2001). By extending colonial conservation policies regarding wildlife, most resource use by local populations was designated as illegal. Exclusion resulting from state policies based on national parks, game reserves, and other sorts of protected areas was challenged for not recognizing the significant costs to local populations through loss of life, property and crop damage due to wildlife predation, as well as their inability to access and benefit from natural resources in their vicinity. Critics argued that management of common pool resources such as forests, wildlife, and fisheries in communal areas either collapsed or fell apart in open access regimes that encouraged overutilization. These critiques of state managed 'top-down' exclusionary conservation models provided an impetus for the emergence of community-based natural resource management (CBNRM) in southern Africa. To its proponents, CBNRM embodied the core sustainable development ethic—balancing material development and environmental conservation, and doing so by taking into consideration the needs of local communities (Hulme and Murphree 2001; Rozemeijer 2003). These programs and approaches mostly emphasized linking the utilization and management of wildlife populations with economic benefits from trophy hunting and tourism.

Community-Based Approach to Wildlife Management

In Botswana, CBNRM broke new ground in the early 1990s by integrating wildlife management, rural development, and tourism.[1] Often singled out as an African success story because of its stable economy and democratic institutions, Botswana has many of the characteristics that bode well for sustainable development. The dominant aspects of Botswana's economy are

[1] The current trend toward CBNRM in southern Africa started in the 1980s with Administrative Management Design for Game Management Areas (ADMADE) and the Luangwa Integrated Resource Development Project (LIRDP) in Zambia, and the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe. Since the late 1980s and early 1990s, Namibia, South Africa, and Botswana also have implemented CBNRM projects.

diamond extraction and its livestock industries, but with national parks and game reserves occupying 17 percent of its total land area and with a further 22 percent designated as wildlife management areas, Botswana is also well placed to benefit from nature tourism. The population of the Ngamiland District in northwest Botswana, where CBNRM was initially implemented, is about 140,000, with 50 percent of the population in villages of less than 500 people. Tourism accounts for about 40 percent of employment opportunities in the region and increasingly shapes local political economies and livelihoods. With a sparse population and vast areas designated for wildlife protection, the prospects for CBNRM in Botswana were high.

Experience with Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe seemed to show that, unless material incentives accrued to rural communities, conservation would be an uphill task.[2] Botswana's CBNRM projects, therefore, adopted elements of CAMPFIRE, specifically seeking to increase the economic value of natural resources and transfer the resulting benefits to rural communities. Initiated by the USAID-funded Natural Resource Management Project (NRMP), in the 1990s, the CBNRM program was implemented through the Department of Wildlife and National Parks (DWNP). Under CBNRM, local communities were allocated community management areas and an annual quota of wildlife, which could be used for commercial hunting. NRMP's approach was to encourage the private sector to operate tourism enterprises in a way that would take into account the needs of rural communities.

The community-based approach to wildlife management in Botswana was shaped by a number of policies and guidelines that were implemented over two decades. The first was the Tribal Grazing Land Policy (TGLP), an attempt at privatizing the grazing commons (Peters 1994). The areas not economically viable for cattle ranching were set aside for other uses. One of the unintended consequences of TGLP was to distinguish economically viable cattle grazing areas from the wildlife-dominated areas. The Wildlife Conservation Policy of 1986, designed to encourage the economic utilization of wildlife, designated these areas (not useful for cattle) on 22 percent of Botswana's land, setting them aside exclusively for wildlife utilization or land uses compatible with wildlife.

To encourage the flow of benefits from tourism to Botswana and to encourage local community participation, a new land use system for these new and smaller Wildlife Management Areas (WMAs) was established.

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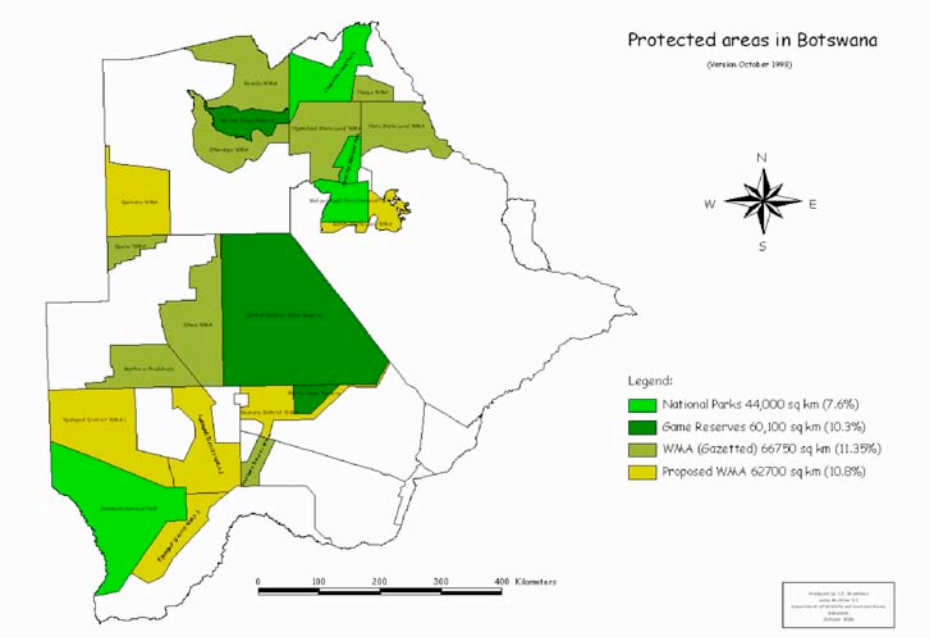
[2] One of the major criticisms of CAMPFIRE in the 1990s was its 'aborted devolution' wherein the districts continued to decide about access to material benefits from resource management rather than local communities.

WMAs, officially recognized through the Wildlife Conservation Policy of 1986, now cover 22 percent of Botswana's land and are set aside exclusively for wildlife utilization or land use that is compatible with wildlife (Figure 1). In 1989, to better manage the consumptive use of wildlife (through citizen and commercial hunting) administrative blocks used by the Department of Wildlife and National Parks (DWNP) to administer hunting quotas, called Controlled Hunting Areas (CHAs) were rezoned. The entire country was divided into 163 CHAs, of which 43 have been zoned for wildlife uses that include commercial and community-managed wildlife use (photographic and hunting safari) areas, livestock areas, and undesignated areas. The WMAs and CHAs provided the foundation of a new property rights system on which CBNRM was implemented.

Newly designated community-managed wildlife use areas became the building blocks for decentralizing resource management through CBNRM. Under the new CBNRM guidelines, if safari operators wanted access to many of the rich wildlife areas of the Okavango Delta, whether for hunting or for photographic tourism, they could do so by partnering with local communities. This required entering into a "sublease" which was a legally binding agreement between a private sector safari firm and a registered entity such as a community-based organization (CBO), which would represent "community" interests.[3] For policy makers, the success of the community-based projects depended on communities establishing representative self-governing community-based organizations. These local organizations were the critical nodes through which project activities were undertaken. Deploying the legal rationalist formal language of "board" and "trust" and "businessman," policymakers expected that functional community-based organizations would be established where all "members" would participate in decision making by freely debating issues, and elect representatives who would represent their communities' demands and operate alongside market actors.

[3] A Community Based Organization (CBO) is a registered legal entity with the authority to obtain leases over communal land. Under CBNRM rules, local communities were required to register an organization recognized as a Trust in order to apply for a lease over the CHA from the Tribal Land Board. A community Trust could sublease use of their land and their hunting quota to a tourism company for photographic or hunting safaris. That is, the CBO would legally sign contracts with the private sector. CBOs also formalize service delivery (for example, hiring consultants and advisors) with supporting agencies as NGOs and donors.

Figure I.



Social Costs and Benefits

By putting communities in charge of local conservation and development priorities and encouraging partnerships with the private sector, CBNRM sought to give communities more power to improve conservation and development outcomes. Communities gaining rights over their resources and working with private safari operators, local government, and national level ministries reconfigures existing social relations, especially patterns of social trust and reciprocity networks. On the other hand, CBNRM is also modified by and translated into each local context since its implementation is mediated by local politics, power structures, and histories (Hoon 2004; Swatuk 2005).

In Botswana the implementation of most policies involves at least some input by the potential beneficiaries. More often than not, though, deliberation about policies means that bureaucrats and politicians utilize various local institutions to *inform* the people about the content of specific policies (Thakadu 2005). More recently, the district development plans have integrated a component of participation by the local people in the policy process. In these instances local people are asked to provide a list of demands, which are then included in the district plans. Critics argue that local participation is given lip service, though in practice the 'top-down'

approach has changed in the design and implementation of policies. The initial deliberation regarding CBNRMs also followed similar trends. Communities were informed about the possibilities of gaining from wildlife utilization. However, what is different in this case is that communities were required to organize into a legally accepted Trust in order to collaborate with private operators. Within CBNRM communities, however, some members distrust the government's long-term commitment toward community ownership of management areas. Most communities have leases for 15 years, even though they have been resident in the area for centuries.

In ethnically diverse communities where several villages have had to collaborate for natural resource management, in many instances there have been disputes over land and resource ownership and access between the majority and minority ethnic groups. Social relations have also deteriorated between communities within the wildlife management areas and neighboring villages excluded from CBNRMs.

The distribution of benefits has been a critical function of local community trusts or CBOs, and has been shaped by and reconfigured social relations, dynamics of local politics, and power structures. During implementation of CBNRM, especially in its initial stages, the private sector, government, and nongovernmental actors approached customary and other local elites including the richer people in these communities. This has led to allegations of mismanagement and corruption on the part of local elites who have tended to use CBNRM benefits for personal gain (Platteau 2004). However, over time elections of members in CBO village trust committees have begun to include women, the more educated, and younger members of these communities. This can be explained in part due to the requirement that local trusts evaluate the tenders from private operators, and make investment decisions. While this kind of participation might reinforce some of the preexisting inequalities within these communities, in the longer term these trends empower local communities, especially in their interactions with external actors including the private sector and state officials.

Economic Costs and Benefits

There are now more than 80 organizations in more than a 120 villages involved in CBNRM initiatives. By 2002 there were 46 CBOs, of which 12 had joint venture agreements with safari operators, which generated an estimated $1.3 million (an average of $120,000 per CBO). Income to the CBOs is used to pay staff salaries, board member sitting allowances, and for community projects of various kinds—including craft shops, bottle stores, guest houses, vegetable plots, and cultural villages (Arntzen et al. 2003).

Although CBNRM projects have been able to generate income for rural communities, they have been deficient or limited on several fronts. The final CBNRM assessment identified a number of limitations. Most CBOs seemed unable to establish and manage projects and continued to rely on the quota and other fees from the joint venture partners. The departure of donors is another source of vulnerability, making rural communities further reliant on mostly white private sector safari operators who tend to privilege the profit motive over community empowerment. These financial vulnerabilities are further compounded by weak fiscal management on the part of CBOs and distribution of benefits through patronage channels and corrupt practices by leaders. With these legal and 'extra-legal' expenditures taking up most of the revenues, very little income 'trickles down' to the household level. Current patterns of benefit distribution in Botswana's CBNRM projects thus may not contribute to the long-term livelihood security of the majority of community members at the individual level, but they provide several collective benefits for local communities.

Sustainability Analysis

In 2005, after a decade of implementation of decentralized natural resource management, the problems of financial management were at the forefront, and contributed to "re-centralization" by the Botswana state. The National CBNRM Forum, which was created in 2000 to coordinate and bring together representatives of all CBOs, in its annual report identified the following issues that threatened CBNRM as a whole:

- There is a lack of skills at the community level to set up and maintain financial management systems that allow for full accountability (to government as well as to the general trust membership);
- In general there are insufficient control mechanisms to avoid a small and "better-skilled" section of the community taking advantage of the power vacuum and monopolizing the community benefits;
- The general membership of most trusts is not empowered enough to demand accountability and representative decision making from their leadership (CBNRM Support Programme 2005).

The Forum argued that CBNRM contributes income for rural communities and is a mechanism of diversifying the livelihood sources of people residing in these communities, and has improved attitudes toward wildlife, but also noted that CBOs were operating in a "non-transparent and non-accountable manner" (CBNRM Support Programme 2005).

This debate and growing criticism of CBNRM has ultimately contributed to a

new draft CBNRM policy initially circulated among various stakeholders, including the CBNRM forum. In its final version, which was passed by the Botswana Parliament in 2007, the CBNRM policy now stipulates that 65 percent of locally generated income which otherwise was accruing to the CBOs community trusts would now be placed in a national fund and available for those communities which did not have access to wildlife or lacked lucrative joint venture agreements. The new policy clearly represents a major shift in the benefit distribution, to the detriment of CBOs currently with joint venture agreements. Whether this effort at recentralization will contribute to the long-term sustainability of CBNRM in general, though, remains to be seen.

As a donor driven project, in its early stages CBNRM lacked extensive community mobilization, though local communities were beginning to recognize the benefits from wildlife. CBNRM, rather than building local capacity for resource management, instead functioned mostly as a revenue-sharing mechanism (Arntzen et al. 2003).

However, CBRNM was not implemented in a sociopolitical vacuum. Although CBNRM may not have substantial political support, the thorough commitment of necessary government departments, or sufficient resources to prepare communities for success, CBNRM was folded and reconfigured into existing social relations. CBNRM is translated into each local context in ways that reflect the politics, power structures, and histories of diverse communities and groups of people.

In northern Botswana, where most CBNRM projects have been implemented, these local understandings are dominated by the presence of wildlife and the costs of living in areas with wildlife. During the last decade, elephant populations in southern Africa have increased to approximately 150,000, while their home range has been curtailed by expanding human settlements, civil war and unrest, land mines, and electric fences. Approximately 70 percent of the range of African elephants is outside of protected areas (African Elephant Specialist Group 2004). Elephants and lions are now responsible for the majority of the human–wildlife conflicts in this region.[4] The effects of living with elephants are unequally distributed and tend to impact the most marginal individuals of rural populations. Government compensation schemes for wildlife damage are both inadequate and premised on the notion that elephants remain the property of respective states. It is in this context that there has to be a renewed emphasis on a

[4] While conservationists are attempting to facilitate transboundary wildlife movements by proposing elephant "corridors" and promoting Transfrontier Conservation Areas (TFCAs), local communities are key stakeholders because it is they who suffer the costs of crop and property damage, and sometimes loss of human life.

second-generation of communal approaches that incorporate the lessons of CBNRM.

Concluding Discussion

After a decade of implementation, the high expectations for CBNRM have been replaced by cautious optimism. (There have been some calls for the wholesale rejection of CBNRM.) In Botswana, as elsewhere in southern Africa, CBNRM did not fully deliver the benefits it promised, either in terms of conservation or in terms of rural development. However, the growing population of elephants in this part of southern Africa has necessitated a reformulation of communal approaches.

Looking ahead and reflecting on this experience, it is clear that CBNRM should be distinguished from 'communal' or community-based approaches, so that analysis of and conclusions about those specific projects introduced through international sponsors and implemented in the short term are not confused with the importance of local empowerment and participation in conservation. Furthermore, the lessons of CBNRM for policy makers and donors is to dispel any notion that the creation of viable and effective localized regimes is simply a matter of good extension work and training in organization and fiscal management. Legitimate and accountable natural resource regimes do not come prepackaged, already assembled. Establishing legitimate community-based and participatory natural resource regimes is inherently a political process and one has to pay attention to policies and processes above the community level, as well as reject naive assumptions of community homogeneity and discreteness dynamics and pay closer attention to competing and complementary interests below the level of a 'community' (Agrawal and Gibson 1999; Brosius 2004; Hydén 2002; McCay and Jentoft 1998). In the end, there is no alternative to recognizing and supporting local populations, especially those residing around protected areas, for sustainable habitat protection over the long term.

The importance of local actors is a critical ingredient for making conservation work. However, the illustrations of community strategies highlight a central dilemma of participatory approaches. The need for "bottom-up" strategies emerged primarily because of the ineffectiveness of state led, top-down approaches. However, participatory development needs an active intervention and support by effective states to be successful (Evans 1996; Platteau 1994). The CBNRM approach assumed that there was a direct link between economic "incentives" or "benefits" and the conservation of wildlife and other natural resources. The pithy statement summarized the basic assumptions of CBNRM: "If wildlife needs to be saved, it needs to pay for itself" (NRMP 1999). Couched in the technical language of

decentralization and local-level empowerment, external state and nongovernmental organizations established the CBNRM framework that included various formal rules and regulations, such as management plans for specific wildlife management areas and "joint venture agreements" to govern the relationship of local communities with private sector operators.

Experience to date confirms that there is no such thing as "one size fits all." Although top-down approaches miss local nuances, CBNRM approaches are not necessarily the only way to implement a community -based approach to conservation. It is important to differentiate "community" approaches, which are introduced within the international project mode and implemented as short-term projects and programs with a wide range of acronyms (each with varying emphasis on what was meant by community and conservation) from the broader claim about the importance of local level empowerment and participation (Murphree 2004). The notion of a community looks very different depending on location or scale. As Peter Brosius (2002) has pointed out:

The idea of community is never unproblematic. Among the most persistent difficulties in addressing the idea of community is not simply challenging romantic representations of community as exemplars of organic harmony, but of arriving at a common understanding of how to even define this entity…[and being attentive to] how communities get constituted in conservation discourse and who does the constituting.

Because the relationship between economic incentives for development and conservation outcomes is politically determined, community-based approaches can become mechanisms for more powerful external state or private sector actors to appropriate local resources. But they also have the potential to motivate local collective action, entrepreneurship, and resource management, thus enabling local people to exercise more control over their own future. This does not mean, however, that focusing on the local level alone is adequate in achieving conservation and development objectives. Local actors by themselves cannot address the challenges of conservation. For community conservation and resource management approaches to work, one needs to pay attention to processes above the level of these communities, as well as below the level of stylized notions of community—the arena of competing and overlapping interests and actors. Effective conservation approaches, while grounded in "community" and attentive to participation, should incorporate an understanding of wider processes and structures, and especially how state and market structures become "embedded" in institutional and cultural patterns of local communities in new ways.

Photo by:
Rony Mejía/
Counterpart
International

GUATEMALA
CASE STUDY

Community-Based Ecotourism in Guatemala: Puerta al Mundo Maya

This model is based on the premise that natural areas are the reason tourists come, and that if the communities perceive a benefit from protecting those natural areas, their livelihood strategy will no longer depend on their exploitation.

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Context

The Verapaces region of Guatemala has been a focus of various political and economic development initiatives. Several policies have been instituted and specific actions initiated by the Guatemalan government, NGOs, and international donor organizations. Among them is the Puerta al Mundo Maya ecotourism initiative discussed in this case study.

Verapaces is comprised of two Guatemalan departments, Baja Verapaz and Alta Verapaz (meaning "low true peace" and "high true peace"). In Alta Verapaz is the municipality of Chisec, whose population had been isolated, impoverished, and severely affected by the armed conflict that ended in 1996 when the Peace Accords were signed. Verapaces is a territory with diverse natural and cultural characteristics (Del Cid 2004).

The natural characteristics of Verapaces include an extended karstic zone, with four limestone formations: Cambur, Coban, Chocal, and one not yet named (Ministerio de Cultura y Deportes 2003). It is the last mountain massif before reaching the lowlands of Peten, and is part of the sedimentary foothills of the Sierra de Chama's orographic system (Ministerio de Cultura y Deportes 2003). The region lies in one of the world's biodiversity hotspots, the Mesoamerican Forests (Bonham 2006). Bonham points out the ecological and conservation significance of the area and the need of management that engages local communities, respecting the social and political context and the existing land settlement patterns.

During the late nineteenth century, president Rufino Barrios initiated coffee growing as a new base for the Guatemalan national economy. Coffee is grown as a monoculture, a technique that is quite different from the cultivation of previous national agricultural products. Coffee plantations expanded across the landscape, requiring extensive hand labor and credit access. Commercialization of coffee growing required international contacts, setting the conditions for production to be dominated by foreigners and elite nonlocal Guatemalan nationals. The government supported policies that included benefits for converting the forests to coffee plantations. Land and labor for these policies was considered free, obtained by dispossession and the forced labor of the indigenous population (Adams 2001; King 1974; Lujan 1998).

Since then, the marginalization of the Verapaz region has continued, being especially pronounced in northern lowland areas of Alta, an area that has remained relatively uncolonized until the mid-twentieth century and that continues to have limited communication services linking it to the country and the outside world (Dickens 2007; Foster and Araujo 2004). During the 1950s the settlement of this area was promoted by the National Institute of

Agrarian Transformation (INTA) as a part of a larger plan to colonize the Northern Transversal Strip, which stretches from Huhuetenango to the Atlantic Coast (Dickens 2007). The theme of INTA's propaganda was to "work the land," which meant that cutting down the forests and creating plantations was required to receive legal title to the land. Chisec lies in this region. It was, however, not affected by these policies until the 1970s, in part due to the region's undulating topography and karstic soils unfavorable to a plantation economy (Dickens 2007).

At that time, Q'eqchi' Mayan families displaced by the armed conflict were in search of new places to live and of land to practice their subsistence agriculture (Del Cid and Garcia 2005). This Mayan group represents the majority of the present day Chisec population. They live by planting maize and beans for subsistence, selling the surplus, and cultivating cardamom and allspice, among others, as cash crops. Chisec has been historically marginalized due to its distance from the nation's capital, a lack of educational opportunities, a high percentage of monolingual Q'eqchi' speakers, and a limited state presence (Adams et al. 2005; Dickens 2007). The Q'eqchi' Mayans depend on the forest for materials for household construction, firewood for domestic use, and medical and comestible plants (Ministerio de Cultura y Deportes 2003). As an example of the social and economic exclusion of these communities, the Ministry of Culture and Sports declared the Candelaria Caves of this region a Cultural Patrimony of the Nation (Dickens 2007), based on their "archaeological, natural, scientific, and speleological value" (Ministerio de Cultura y Deportes 2003), without any consultation or participation of the surrounding villages of Muqbil'ha and Candelaria (Del Cid and Garcia 2005).

By 2002, the road between Chisec and Coban was paved, providing a link with the national capital. This road facilitated the entry and establishment of international development organizations, businesses, and tourist services. At present, there is a limited government presence in Chisec, and an absence of organizations related to ethnic identity. This leaves NGOs to serve as the prominent civil society players in community development (Dickens 2007). The implementation of neoliberal economic policies in Guatemala, as well as other areas of Latin America, led to a reduction in state services and increased the reliance on national and foreign NGOs to provide skills and enhance the livelihoods of residents of these impoverished areas (Gwynne and Kay 2000). The Chisec region has seen a boom in the number of development projects directed toward improvement of nutrition, access to basic health care, obtaining land titles, and introducing alternatives to subsistence agriculture (Dickens 2007).

The area presents numerous challenges. It is threatened by demographic pressures, the result of an unprecedented increase in birth rates together with permanent in-migration of the poor in search of land. Under these circumstances, the traditional "slash and burn" agricultural practices, planting

maize and beans, are rapidly degrading the region's tropical forests at an unsustainable rate. This environmental risk motivated the conservation and development communities to search for livelihood solutions that change the economic incentive structure, allowing local people to protect their natural resources while providing alternative sources of income. By linking livelihoods to resource protection, the Puerta al Mundo Maya ecotourism initiative presented one possible solution to this quandary (Adams et al. 2005; Dickens 2007).

Participatory Resource Management System

The region of northern Alta Verapaz and southern Peten has been, until recent years, an unexplored area rich in natural and cultural resources. As pointed out, after the Peace Accords were signed and the road to Coban was paved, there was a search for new economic alternatives based on the sustainable use of natural resources. The high tourist potential for the region, based on its natural beauty and cultural significance, led to the creation of the first tourist destination route managed entirely by indigenous communities. The name of this ambitious initiative is Puerta al Mundo Maya, meaning "Gateway to the Mayan World," because it is an entrance to the renowned archaeological sites of Peten.

The Puerta al Mundo Maya project was initiated in 2001 through a multiparty collaboration composed of the Chisec municipality, local Peace Corps volunteer Jason Pielmeyer, Vanderbilt University's Cancuen archaeological project, the Guatemalan Technical Institute for Training and Productivity (INTECAP), and the U.S. Agency for International Development (USAID). The initial phase of the project had five parts: community approach and awareness building; community organization and planning; development of tourism-related infrastructure; local capacity-building workshops; and publicity. As a result of these activities, five tourism and development community organizations were formed. Two of those community organizations have developed tourism management plans and negotiated with the Ministry for Culture and Sports (Ministerio de Cultura y Deportes, or MICUDE) for the co-administration of the Candelaria Caves. The outcome of those negotiations was an agreement, signed in 2004, that represents the first community–state alliance to preserve a cultural patrimony area, including its natural resources (Del Cid 2004; Dickens 2007).

By the end of 2002, USAID was interested in continuing the work of the Puerta al Mundo Maya ecotourism initiative and its support to the region. In coordination with the Cancuen archaeological project, SANK (a local Q'eqchi' nonprofit) and the Peace Corps designed a new project to be executed by U.S.-based NGO Counterpart International. This was called the Q'eqchi' Maya Community Development and Sustainable Tourism Project (Adams et al. 2005; Del Cid 2004; Del Cid and Garcia 2005; Dickens 2007).

As Adams et al. (2005) state, "The project aims to be a sustainable, permanent solution to alleviate poverty and promote environmental conservation through the development of community-managed tourism enterprises and establishment of systems and institutions of natural resource management."

In 2003, seven communities in the region were targeted by the development project: Muqb'ilha', Candelaria Camposanto, Sepalau, El Porvenir II, La Union, and El Zapote. All sought to diversify their subsistence agricultural systems by including cash crops such as cacao, vanilla, and allspice, and to develop community-based tourism. These initiatives, agricultural diversification and community-based tourism, constitute the two complementary components of the new project. The development of Forest Gardens focused on forest and biodiversity recovery while providing a productive alternative to the traditional slash and burn system, and sustainable community-based tourism sought to strengthen and consolidate a community tourism route with an integrated development perspective (Adams et al. 2005; Del Cid 2004; Del Cid and Garcia 2005; Dickens 2007).

Forest gardening is based on a methodology called analog forestry, which imitates natural forests. It synthesizes scientific knowledge on conservation and biodiversity with sustainable agricultural techniques and local knowledge about home gardens, giving place to a variety of tree crops compatible with natural forest permanence. This constitutes an effort by the local farmers not only to preserve the present forest coverage but to restore the ecosystem and its biodiversity, while achieving permanent productive cropping systems dominated by trees (Del Cid and Garcia 2005).

Presentation of a forest garden. Photo by: Rony Mejía/ Counterpart International

Community-based tourism presents an alternative path to tourism development. Traditional tourism, as an industry, is established, managed, and run by foreign entrepreneurs, enterprises, and/or agencies (Adams et al. 2005). There is little local input, and benefits tend to be limited to low-level employment opportunities. The employment offered is limited to lower-paid jobs and meager working conditions. The activity does not present benefits or incentives, either to manage and protect the natural habitats or to engage in tourism-related enterprises. Frequently the environment may be degraded by the visitors, and successful local tourism-related businesses expropriated by more competitive outside and foreign enterprises. That is why the agencies involved choose to orientate their actions on the development of community-based sustainable tourism. Sustainable tourism focuses on enhancing the interactions between tourists and the local population. In this model, visitors learn about local cultures and learn to appreciate environmental amenities (see Counterpart International in Adams et al. 2005). This model is based on the premise that natural areas are the reason tourists come, and that if the communities perceive a benefit from protecting those natural areas, their livelihood strategy will no longer depend on their exploitation.

The sustainable tourism component of the Chisec project attempts to both diversify income options and generate additional income sources, through sites managed by voluntary community-based associations, combining eco- and pro-poor tourism elements. A long-term objective is for these community-based associations to manage themselves as independent and sustainable businesses. At present, they operate with Counterpart's external assistance. The link between the two components is the educational use of forest garden demonstration plots as a tourism amenity. The forest gardens demonstrate ecological, healthy, and productive agricultural practices, enhancing the tourists' experience (Adams et al. 2005). The project identified five tourist destinations with seven related communities: Sepalau Lagoons (Sepalau community), B'omb'il Pek and Jul Iq' Caves and San Simon River (El Porvernir II community), Candelaria Caves National Park (Mucb'ilha' and Candelaria Camposanto communities), and the Cancuen archaeological site (La Union, El Zapote, and Santa Isabel communities) (Del Cid 2004).

Seven Chisec project activities aim at building local capacity: skills training programs; guide training; environmental education; small business development; basic infrastructure development; marketing; and building civil society. These activities relate to the five interrelated project objectives: community involvement, organization, training programs, infrastructure, and marketing. Through these activities, the project strives to enable the communities involved to simultaneously improve agricultural practices and food security, take advantage of alternative income generating activities, conserve and protect biodiversity, improve community awareness of basic health and environmental issues, promote land tenure security, and build civil society (Adams et al. 2005; Del Cid 2004; Dickens 2007).

Social Costs and Benefits

In discussing the social and economic benefits of this project, it is important to understand the social conditions of the region. The Guatemalan Secretariat of Strategic Planning (SEGEPLAN) states, "poverty is the result of the lack of education and medical care as well as the lack of job opportunities and decent salaries." And related to this, "the overexploitation and degradation of natural resources contributes to the deteriorating health, nutrition, and production capabilities of the inhabitants of the department of Alta Verapaz, aggravating their poverty [living on $2 per day] and extreme poverty [living on less that $2 per day]." (SEGEPLAN 2003). In addition, the Maya populations that settled the region have suffered a tragic and repressive past, and face problems of severe poverty and land scarcity, as well as suffering other forms of more recent violence (Adams et al. 2005; Bourdieu 1988).

Development agencies are challenged to be sensitive to these conditions, as well as not reproduce the modernist doctrine referred to by Escobar (1995; 2005) as "development apparatus," which in part has the intention of wresting power from local populations, making them internalize the idea that they are "underdeveloped," and thus strengthening their dependency on nonlocal entities. Counterpart International intentionally has addressed those challenges, and has looked for creative solutions and searched for alternatives to deal with the combination of problems that affects the region. It is necessary to recognize that the state's intervention in the region, in spite of the high NGO activity, is still needed, especially in the area of social services (Adams et al. 2005).

The strategies of Counterpart International are to listen carefully to the poor, while supporting and building systems with them for economic sustainability and the conservation of the environment. This necessitates involving the communities in every step of the project, from identifying their needs and resources, through the search and definition of alternatives, to all the actions taken. Community participation is exemplified by the tourism component of the project, which has produced important results. The social aspects of those results are considered in the following paragraphs.

As mentioned earlier, community organization is a key aspect of the project. Community structure was already present and defined in communities along the proposed tourist routes. This structure included village committees with boards of directors. However, these committees and boards were not legally able to solicit donations or initiate projects. To address this problem, new tourism and development associations, which have the potential to manage funds and execute projects, were created in participating communities. These associations are egalitarian organizations, since everyone in the community

can take part. Commissions in charge of specific matters were created within each association. Counterpart International has focused on providing training to strengthen the associations and their members (Del Cid 2004).

In developing the capacity of these tourism associations, the problems that needed to be confronted were a lack of strong village-level leadership and the inability to delegate authority. Power often tends to reside in a few village members. There is a general need for training and confidence building within the associations' membership. This last aspect refers especially to the independent growth in associations, as required, from the development agencies and Peace Corps volunteers, and to the ability to coordinate efforts among communities (Adams et al. 2005). Another problem refers to the associations' priorities, often focusing on the tourism, cash crops, and land titling related actions. This results in relegation of other community issues, such as providing basic services, to a lower priority (Dickens 2007). Finally, it should be recognized that social networks within a community may be harmed by an increase in tourists, even though at present visitor numbers are growing gradually and in a manageable way.

In contrast, Adams et al. (2005) identified several benefits from the sustainable tourism component of the project. They found that the large majority of villagers believe that their community is wealthier than before the project began. This is related to the types of jobs that were created. Those jobs generally do not require a high level of education, are service oriented, and offer equal opportunities for women. There were also tangible nonmonetary benefits from the project. Roads and community infrastructure was improved, as well as such nontangible benefits as increased individual and collective self-esteem. The support given to community organizations and their enhanced capabilities resulted in the community associations being self-sustaining mechanisms for the development of skills and entrepreneurship. Evidence for this is the successful establishment and maintenance of numerous tourism businesses. For the project, the more important achievement is the control the communities now have over their cultural and biological resources. This is combined with the enhanced role that women play in the conservation and sustainable utilization of forest resources, their influence in making decisions, and their greater economic power (Adams et al. 2005; Del Cid 2004).

Economic Costs and Benefits

Among the seven objectives of the 2003 proposal presented to USAID, four are economic: increase economic opportunity; promote and develop sustainable tourism; promote land tenure security; improve agricultural practices and food security. Evaluating the project by these objectives, Adams et al. (2005) state that the project exceeds expectations and shows success. In more than 30 communities around Chisec, there are forest

gardens that include high-valued export crops, medicinal plants, and high-nutrient fruit and vegetables. There is also a focus on training for the production and processing of agricultural goods, as well as marketing and the creation of market linkages to export businesses.

The economic power of tourism, with a sustainable community orientation, can be used as a development tool to address poverty in developing countries. However, it is important to note that the presence of tourists alone will not guarantee benefits to the poor (Adams et al. 2005). Traditional Guatemala tourism programs were controlled by nonlocals, who brought in capital and knowledge and established tourism enterprises (Del Cid and Garcia 2005). The local communities did not benefit from this kind of tourism. The lack of opportunity forced villagers into illicit actions, such as poaching and illegal tree cutting, degrading the natural resource base.

The Puerta al Mundo Maya initiative's community-managed tourism sites are attempting to both diversify and generate additional income for local people. Prior to this effort, the primary economic activity in the area was agriculture. Under the project's initiatives, numerous alternative forms of employment were developed and made available to the local people, such as guiding, cooking, work as park guards and store clerks, handicrafts, construction and maintenance, boat operators, and excavation workers.

Adams et al. (2005) reported that for 2005 many of the jobs were being shared among the community, but they also indicated a low overall increase in income from tourism. The income generated by tourism in that year was a relatively minor addition to total household incomes. It is important to note that wages in tourism-related work are small; income comes mostly from tips (i.e., gratuities). But tips depend on tourists actually coming to the sites, and visitation is a complex situation. There are very low business periods and heavily concentrated ones (e.g., domestic visitors during Holy Week), generating irregular and unstable incomes. This is related to marketing, which so far has been limited and relies on Counterpart's actions and activities (Del Cid and Demarest 2004). Marketing activities have been focused on the market demand identified in two market studies of the routes. To be successful a different marketing strategy needs to be developed, which must include differentiation, complementation and market segmentation. On the other hand, despite the limited marketing efforts, the visitation levels of the routes have grown steadily. The tourism activities managed by the associations and communities have responded in a way that shows their maturity (Del Cid 2004).

The most important achievement of the project is the creation of the tourism associations with the authority to manage funds and formulate and execute projects. Although Enriquez and Maldonado (2007) explain the necessity of a permanent credit line with low interest rates and payment terms adapted to real communities' capacities, the tourism associations have, with the limited

resources available to them, initiated several projects focusing on small-scale tourism infrastructure (Del Cid 2004). That infrastructure development could be the key element that guarantees a satisfactory visitors' experience, while at the same time serving the communities' needs. Examples include the construction of trails to commercialize villagers' products, and a visitor center that serves as a meeting place for other organizations, training workshops, and a place to display cultural heritage. This is a real benefit to the communities in general.

The importance of the jobs created by this tourism development is synthesized by Dickins (2007): "Dedicating time to activities associated with the tourism enterprise (e.g., construction and maintenance of the site and the road, guiding, cooking) is more attractive than participating in other programs, because individuals either receive income for the services they provide, or will soon benefit from attending training workshops." The sustainable tourism component has achieved the goal of diversifying incomes. Although the increase has been limited, it has in some instances been significant at a family level. The training aspect of the project has also been successful. Workshops have been useful for both components, forest gardens and sustainable tourism, and have a multiplier in that they provide skills for building community businesses and strengthening community organizations (Del Cid 2004).

Biodiversity Costs and Benefits

Adams et al. (2005) describe the region as an area with a "reputation as a place of wild beauty full of archeological and ecological treasures to explore. The landscape of Alta Verapaz is dramatic indeed, with a tropical forest ecosystem, limestone caves, clear rivers and lagoons." These natural amenities are a focus of the project's fifth objective, to "conserve, protect and restore globally significant biodiversity hotspots." The evaluation of such an objective can be somewhat difficult, in part due to the lack of measurement tools related to biodiversity. Hence the literature about the consequences and impacts of the project on the region's biodiversity is scarce. However, there are several important aspects of biodiversity to consider.

First, it is necessary to understand the environmental problems of the region. Significant environmental problems include deforestation caused by the expansion of cattle ranching and slash and burn agriculture. Both are unsuitable to karstic soils, and are a result of population growth. Pollution of water resources is another environmental problem. Water borne diseases cause human health problems and access to drinking water is limited; both problems are a threat to sustainable tourism (Adams et al. 2005).

The analog forestry component of the project endeavors to create an

agricultural system that is very different from the slash and burn monoculture presently being practiced, creating agriculture that functions similarly to a natural forest. Forest gardens, which will be a more natural and sustainable economic option for local farmers, are designed to address food security problems, destructive agricultural practices, and diversification of income (Adams et al. 2005; Del Cid and Garcia 2005). They have been established in more than thirty communities in the Chisec area. Forest gardens provide an economic alternative with a conservation effect, mainly because there is no need for the removal of large amounts of biomass (Adams et al. 2005).

As mentioned before, forest gardens combine a modern scientific approach with local and traditional knowledge, resulting in a diversity of plantings that provide ecosystem integrity. Importance is not only assigned to the forest coverage, but to permanent productive systems dominated by trees that contribute to and assure the restoration of biodiversity. Guzman et al. (2005) emphasize the importance of home gardens as agroecosystems that can generate and conserve genetic diversity. Forest gardens serve a similar role in natural ecosystems, conserving genetic diversity while providing an alternative to traditional agricultural practices. They are also centers of natural and cultural richness.

The project works to conserve vulnerable natural areas and ensure sustainable livelihoods by transforming land-use and businesses practices. The sustainable tourism component takes advantage of business opportunities to motivate people and provide communities the opportunity of protecting their natural environment. However, without planning the tourists could overwhelm the natural surroundings, degrade the sites, and cause irreversible harm to ecosystems. By 2005 only one community had instituted an environmental management plan (Adams et al. 2005). Trash and waste management represents a significant environmental problem because it is exacerbated by tourism.

Given the incompatibility of tourism development and nature conservation, there have been tools developed and actions taken that lead to a more cooperative association. The forest gardens demonstration plots are an example. They are strategically placed along the tourist trails, demonstrating ecologically sound agricultural practices while enhancing the visitor's experience by providing them with interesting and educational information about nature.

This effort corresponds to one of the principles of sustainable tourism, that environmental education helps to protect the tourist destinations and build awareness and local change attitudes and ways of living. As Dickins (2007) puts it, "In the last few years, scientists and NGO representatives have explained to local guides the archaeological and historical significance of the ceramic artifacts and obsidian blades found in caves throughout the Chisec

region. Cave experts have emphasized the delicate nature of the stalactites and stalagmites, have taught guides the names of various cave formations, and have designated which caves should be open to tourists and which should be off limits in order to preserve them. Guides now communicate this knowledge to tourists, including nationals, local Q'eqchi' speakers, and foreigners, as well as to other community residents.

Conservation is a crucial component of the Chisec project, being a priority especially in the training workshops. Conservation training contributes toward the goal of sustainable tourism by providing the tools for communities to protect their natural environment. Adams et al. (2005) lists as a success of the Counterpart International project the development of an ethos among local groups towards stewardship of their natural resources. The same authors call attention to the Q'eqchi' culture, which historically has comprehended a relationship between humans and the environment. Wilson (1995) speaks on the subject of Q'eqchi' flexibility and ability to learn about the ways of life required to live in a diversity of natural contexts, since they have been forced to migrate to many varied places.

The Q'eqchi's social capital in relation to nature was recognized by MICUDE's agreement on the comanagement of the Candelaria Caves, which provides a precedent for communities to share responsibility and rights to natural and cultural resources, and their administration and protection. This agreement constitutes a conservation strategy that is at present unique, but can serve as a model to learn from and to work with, and which by including local populations challenges top-down approaches (Dickens 2007). Finally, as communities acquire authority over their natural resources, they have an interest in preserving them, they develop the capacity to practice sustainable use, and experience the growth of collective self-confidence (Del Cid 2004).

Sustainability Analysis

Although the initial objectives and activities of the Puerta al Mundo Maya project have surpassed expectations, there remain quite a few areas where improvements can be made. The project's purpose was to alleviate poverty and encourage environmental conservation. The operating principle was to work toward a sustainable solution to these problems.

Adams et al. (2005) identified six key points needed to guarantee the continuous success of the project. First, there is a need to shift control to the local ecotourism associations. This transfer of control needs to be appropriately administered, where the communities understand and can think about their roles and responsibilities, and where they are involved in each step taken. Second, there needs to be community control over marketing efforts and ecotourism activities. This is necessary to ensure that the communities learn the commercial aspects of the project, to assure a

sustained income. As a third issue, the authors emphasize the need for intercommunity cooperation, and stress the need for a systematic approach to its development. Intercommunity cooperation may include market research, fund-raising, and financial management; all reduce reliance on external aid. The certainty of land tenure and secure ownership title is the fourth issue. These are pressing local requirements, and failure to address them may put at risk the entire project. Fifth, environmental management plans for each community are an urgent need. These plans must include visitor management rules and regulations, and empower existing institutions or build new local institutions for natural resources stewardship. The last issue the authors consider is tourism infrastructure. The emphasis on a large tourism infrastructure was minimal at the beginning of the project, but becomes an important consideration when trying to increase earnings.

In relation to the environmental commitment, Del Cid and Garcia (2005) speak about the 30 forest gardens created in the communities. Those gardens transformed land use from pasture for cattle and monoculture cultivation to one that is beneficial both economically and ecologically. Associated with that transformation is the land use planning that took place, identifying lands appropriate for traditional agricultural practices (maize and bean cultivation) without causing damage to the ecosystem. This represents a commitment to environmental sustainability that may with time become stronger and permanent.

Specific and related concerns have been reported by other community-based tourism sites with a conservation orientation, such as the Quichuas of Ecuador (Hohl and Grefta Mamallacta 2000). They faced several challenges: ecological conscience-building and training of community members; environmental impact analysis and monitoring; market analysis; strategy and capacity building for commercialization to secure income and autonomy; development plans including diversification of income sources; and the lack of a distinction between the social and productive components of the enterprise. Additionally, Del Cid (2004) describes further difficulties and lessons learned regarding the sustainable tourism experience of the Puerta al Mundo Maya communities. Those difficulties need to be addressed, and the lessons learned operationalized in order to achieve the project goal of poverty alleviation and minimizing environmental degradation. The author is concerned about relations among the project communities, referring in particular to the different level of development of each site, making service standardization along the route a challenge. Collaboration with the national government also remains problematic. A lack of basic services, including communications and government institutions, especially institutions charged with environmental protection, inhibits tourism development and conservation efforts. The Guatemalan Tourism Institute (INGUAT) does not endorse community guides. The coordination with MICUDE in the Puerta al Mundo Maya project constitutes an exception, and shows the importance of national government collaboration in the local management of

natural and cultural resources.

Also important to the project's sustainability is culture. Planning of all tourism activities needs to consider the communities availability, respecting their "annual calendar" and "typical day" activities. Just as important are gender and generational considerations. Sustainability rests on the assurance that the benefits reach all social groups. A holistic and long-term perspective is considered necessary to area development, an approach that mixes tourism development with health care, education, food security, and related basic services for investment and support. No project's objectives can be achieved if it ignores local welfare and poverty-related issues. Exclusion from public institutions and services needs to be simultaneously addressed, otherwise, sustainable development will be precarious (Enriquez and Maldonado 2007).

The organization and training focus of the project is a response to these problems. Equal opportunity for participation is an exercise of control, leading to empowerment (Dickens 2007). A notable example of this is Chisec's shoeshine union. Launched by Peace Corps volunteers and a local youth group, this initiative looks to promote leadership and better working conditions, as well as instill pride, commitment, cooperation, and sense of belonging (Feldman 2002). The union is supported by SANK through a scholarship program (SANK 2006). Through the scholarship program, younger members of the community have the ability to engage in social, cultural, economic, and natural resource development work. As stated by Dickins (2007), those local development ends lead to an ability of local inhabitants to control the course of the change processes within their own communities. Finally, Del Cid and Garcia (2005) make understandable the concept that when communities have as an alternative comprehensive development, based on the sustainable use of resources, training and recognition of the importance of their participation in the management of natural resources, and cultural diversity, they can be the best allies in the protection of their environment and cultural heritage.

A certified forest area in Nepal. Photo by: Asia Network for Sustainable Agriculture and Bioresources

NEPAL CASE STUDY

Community-Based Forestry in Nepal *

Community forestry has rightly been credited with the re-greening of the hills of Nepal.

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Context

Nepal has witnessed a trend of deforestation throughout its history, as forest lands have been converted to crop lands. The country was unified in the late 18th century by the Gorkha King Prithi Narayan Shah, who encouraged the conversion of hill forests to agricultural lands as a way to increase the taxable land base. This policy of encouraging land conversion to agriculture continued through the end of the Rana regime in 1951. By this time most of the land suitable for agriculture production in the hills of Nepal had been deforested (Ives and Messerli 1989). One-third of the total forest and cultivated lands of the country, primarily in the Terai region, were under birta[1] tenure with 75 percent of that area belonging to the Rana family (Regmi 1978).

The 1950s saw a period of democratic rule in Nepal, under the socialist-leaning Nepal Congress party. To reverse the birta land monopoly, all forest lands were nationalized in 1956, followed by the establishment of a nascent forestry bureaucracy charged with managing forest resources. Malaria eradication in the southern Terai zone, accompanied by a government sponsored resettlement program in the Terai, initiated a period of massive deforestation in this fertile and easily cultivated region. The nationalization of forest lands also led to a "tragedy of the commons" scenario where, in the absence of government control, forests were rapidly exploited.

By the 1970s there was a growing international concern over the rate of deforestation in Nepal. A theory developed linking deforestation in Nepal to the increased severity of floods in Bangladesh (Eckholm 1976).[2] A 1980 World Bank document estimated that at the rate of deforestation occurring at that time, all accessible hill forests would be gone within 15 years and that the Terai would be treeless within 25 years (Gilmour et al. 1989). The villain in the story behind these dire predictions was the ignorant Nepali hill farmer, who was having too many babies and spending his or her days mercilessly whacking the neighboring trees. These predictions led to an infusion of international aid to save the forests of Nepal.

By the mid-1970s the forestry establishment, with significant nudging from the donor community, began to realize that the top down approach to the deforestation problem was not working. There were too many small forest

[1] Birta was a feudal land tenure system, under which land grants were made by the state to individuals on a tax free and heritable basis.

[2] In the mid-1980s, work by Ives and Messerli (1989) and Hamilton (1985, 1987) began to re-evaluate the theory of Himalayan degradation, recognizing the role of natural mountain geologic processes. However, a theory once accepted is hard to kill.

patches in the hills of Nepal for the Department of Forests (DOF) of the Government of Nepal (GON) to control. There were too many hectares to reforest and too many "ignorant" villagers to convince not to cut trees on government land. In 1975, a key conference was convened by the Department of Forests in Kathmandu to discuss the state of Nepal's forests. The conference remained convened for an incredible 23 days, as participants hammered out a new vision for the forests of Nepal. The result was a national forestry plan, published in 1976, that redirected attention from the valuable timberlands of the Terai to Nepal's hill forests, and recognized the need to involve local communities in the management of nearby forest resources (Gilmour et al. 1989; Hobley 1996). Following up on this activity, the Department of Forests, working with the donor community, developed a 21-year Forestry Sector Master Plan, addressing an array of needs to move toward a comprehensive community forestry program (Government of Nepal 1989).

Participatory Resource Management System

It took 20 years of experimentation to begin to get the necessary social organization and resource management systems in place. Initially, control of forest resources rested with the local "Panchayat" government. It took the change of control from local government to recognized community forest user groups (CFUGs, composed of those communities who are traditional users of a patch of forest), the 1990 return to multiparty democracy bringing a degree of administrative accountability, and the enactment of Nepal's new Forest Act (1993) and forest regulating bylaws (1995) for the community forestry program to begin to go to scale (Sowers et al. 1994; Kanel and Niraula 2004).

Table 1

Fiscal Year	Number of CFUGs*	Community Forest Area (Hectares)	Households
Prior to 1984	99	5 982.74	10 440
84/85	1	15.50	53
87/88	1	27.00	35
88/89	10	567.96	1 115
89/90	42	1 972.57	4 492
90/91	87	5 011.53	12 973
91/92	339	20 759.90	34 952
92/93	729	51 585.12	80 180

93/94	1 204	87 692.80	131 809
94/95	1 645	119 775.60	178 499
95/96	1 743	155 862.58	194 404
96/97	1 586	132 634.29	180 337
97/98	1 438	135 886.15	168 504
98/99	1 157	99 065.79	135 090
99/00	1 079	93 678.22	123 528
00/01	855	89 960.83	98 591
01/02	644	57 347.12	91 333
02/03	600	44 715.93	70 359
03/04	577	42 863.06	69 844
04/05	400	40 103.56	49 800
05/06	10	1 118.01	1 144
06/07	91	32 645.74	10 235

*Community forest user groups. Source: Department of Forests, November 2007

Table 1 shows the annual progress in the establishment of new forest user groups and the handover of management responsibility. The 2001 slowdown in establishment of new groups was due to the Maoist insurrection and limits on the administrative capacity of the Forestry Division (Rechlin et al. 2007). At present there are 14,337 community forest user groups in Nepal, managing 1,219,272 hectares of forest lands. The program has national significance; one out of every three Nepali citizens is a member of a forest user group.

The community forestry system calls for the facilitators[3] to identify eligible members of a forest user group and delineate the forest patch to be handed over to the group. Once established, the user group works with the facilitator to draw up a constitution for their group and a management plan for their patch. The group is free to determine its priority needs and how it will protect the forest. Users manage their forest for fuelwood, fodder, grass, fallen leaves, poles for house construction, and new or enrichment plantings.

[3] The persons with the skills and knowledge to facilitate the community forestry process. They can be a midlevel technician of the Department of Forests or an NGO employee.

They place restrictions on use to guarantee the sustainability of the resource base and devise a scheme to protect the forest from illegal use by village members or outsiders. The user group also maintains a common fund with a bank account, and elects an executive committee with the responsibility of implementing their constitution and plan. Once these are in place the district forest officer formally hands over the delineated forest to be managed by the plan agreed on by the user group. Plans cover up to a 10-year period, and failure to abide by the plan can result in the department again taking control of the community forest (Government of Nepal 1993, 1995; Department of Forests 2001).

Social Costs and Benefits

Forest user groups are new social institutions in village Nepal. Traditional social institutions in rural Nepal are often caste bound and exclude women from decision-making outside of the home. Forest user groups were conceptually developed as egalitarian organizations, where all forest users, regardless of caste, gender, or economic status, would have an equal say in the decision-making process. Elected members of the user group's executive committee are to represent all settlements included in the community forest, as well as women, caste groups, and members of disadvantaged community groups (Department of Forests 2001). Implementation, however, often runs up against village societal norms and accepted practices. For many disadvantaged, uneducated, or impoverished groups, low self-esteem also hinders their full participation in the program.

Women participating in the community forestry planning process in Nepal.
Photo by: ANSAB

As a new social innovation, and one with defined rules of inclusion, early evaluations found that CFUGs were shaking up traditional societies. With a guaranteed seat at the table, women were being elected to community forestry executive committees and serving as chairpersons of those committees. This process helped to increase women's participation in community forestry significantly (Subedi 2006). Of 14,337 established CFUGs, 784 groups are headed by women. Often a CFUG would build a local office where informal literacy classes were being held and where "caste was left at the door" (Sowers et al. 1994). A study of community-defined indicators of success (Pokharel and Suvedi 2007) listed women's participation in CFUG operations as one of eight key indicators.

The social benefits of community forestry, however, including livelihood enhancement and democratic governance, have not reached their full potential. Second-generation issues or challenges, including post-formation support, equity in decision-making, benefit sharing, and determining potential commercial uses for the forest have emerged (Gilmour 2002). Select stakeholders, mainly the elite and powerful, have come to dominate decision-making in many CFUGs. A study on access to power through the narratives of 38 forest users (Lachapelle et al. 2004) found the crosscutting themes of inferiority, vulnerability, and lack of transparency to be hindering social inclusiveness in CFUG operations. Those narratives included quotes such as:

The blacksmiths belong within the illiterate, lower caste. They don't know the benefit and what the forest provides for us.
The people from the lower caste don't know what and how to speak in a crowd.
I alone cannot go (to the meeting). If this is the tradition of the village and I go alone, then people will start to talk.

These second-generation issues are being dealt with through refocusing community forestry goals on livelihood enhancement. Pro poor and inclusive processes have been developed for use in the community forestry program. One of these involves working with communities to develop a livelihood enhancement plan as part of the forest management plan review process (Joshi et al. 2006). As opposed to the prescriptive approach now taken, this new process embraces an adaptive management approach to planning and recognizes that the social setting in each village or community is unique, requiring an individualized response.

Economic Costs and Benefits

Dev et al. (2003), in a study on the impacts of community forestry on the livelihoods of people in the mid-hills of Nepal, put the potential benefits in the following categories:

- Improved and increased sustainable flow of forest products
- Improved social capital
- Improved community infrastructure or physical capital
- Improved human capital
- Improved livelihood opportunities.

This economic analysis will follow that pattern, using Dev's categories.

Sustainable flow of forest products

Community forestry invariably starts with a period of forest protection, allowing for regrowth, which is followed by a management strategy that limits harvest to prevent degradation of the biological resource base. This results in an improved condition of the forest, resulting in sustainable harvest at a higher rate (Yadav et al. 2003). In his study, Dev (2003) found that almost all users recognized that the forest was now more sustainable in providing for their everyday needs.

A study by Jaiswal et al. (1994) showed conclusively that growing trees in Nepal was a good economic investment. Using an agro-forestry plantation established in 1983 and harvested seven years later, they showed that the present net value of the products sold far outpaced the value of the agricultural products that could have been grown on that piece of land.

Forester (1995), as part of a financial analysis of the proposed USAID funded Environment and Forest Enterprise Program, conducted a financial analysis of enhanced product availability due to community management of forests in the Rapti development zone. He found that the protection and management of trees afforded under the community forestry program would increase the total present net worth of the forest area in the zone by $39 million, equating to an income of 713,900 rupees per year (1996 conversion rate) on an average 100-hectare community forest. In addition to timber values, protection and management of the lands results in increases in fodder and in agricultural production due to increased leaf fall for composting. He estimated that increased milk production related to fodder and increased corn production related to fertility would add another $130,000 per year to the value imparted by the proposed programs under the Environment and Forest Enterprise Project.

Fox (1993) compared forest condition and management in Bhogteni village in 1980 to that in 1990. He found that, as an early participant in the community forestry program, Bhogteni had increased its fuelwood supply from 370,000 kg/year in 1980 to 800,000 kg/year in 1990. Yadav and Branney (1999) found that stem count per hectare in the community forest of four Koshi hill districts was increasing significantly, 51 percent, between

1994 and 1997.

Improved social capital

As new and inclusive social institutions, CFUGs are providing a new forum for planning development and promoting social cohesion. Their creation has helped build capacity at the local level for managing finances and working with government officials. This capacity building has extended to the regional and national level with the creation of a formal network. This network, the Federation of Community Forestry Users Nepal (FECOFUN) has been operating since 1996 as a representative of CFUGs. More than 11,400 have been federated under the FECOFUN umbrella. FECOFUN is organized with a national secretariat, with regional and district chapters to support local user groups and influence government policies and decisions in favor of CFUG interests. FECOFUN is active in policy advocacy, awareness building, and participation in forest policy development (Ojha 2002; FECOFUN 2007).

Improved community infrastructure (physical capital)

Community forestry was conceived of as supporting the subsistence lifestyle of Nepali farmers. The regulations stipulate that community forestry funds are to be kept in a common fund, not distributed to the users, and can only be used for improvements to the forest or for village level development. One of the surprises of early evaluations of the program was how these locally controlled common funds were being used to support local development initiatives (Sowers et al. 1994). As the fund increased through the sale of surplus products, so has its potential for benefiting the local community. This is now a widely accepted phenomenon, with examples of locally initiated development that include improved drinking water supply, support to schools, construction of community halls, contributions to temple or monastery construction, village electrification, and road repair, among others (NACFP and NEFEJ 2005; LFP 2006; Subedi 2006). In the groups studied by Kanel and Niraula (2004), 36 percent of their annual expenditures went toward community infrastructure development.

Improved credit opportunities (human capital)

Breaking free from the cycle of debt incurred by relying on the local money lender or the formal banking system can be a big step forward in improving the financial security of local people. A study by the microcredit support agency in Nepal found that CFUGs were remarkably strong community-

based organizations, with the leadership, management skills, and internal systems to support successful microcredit operations (Micro Finance through forest user groups: A good fit? 1999). Many CFUGs institute a microcredit scheme by which members can borrow small amounts from the common fund for income generating activities. The interest rate of the loan is fixed by the CFUG, and is nominal compared to other banking systems, ranging from 0 to 10 percent in the Parbat district (Binayee et al. 2004). They found that the Bause CFUG was a successful example of the micro-finance-system's contribution to forest-products-based enterprises. The CFUG provided loans to the four poorest households to establish a bamboo craftmaking enterprise. They earned 36,340 rupees from their business in 18 months after repaying the loan. Similarly, the Dhureni CFUG made a low-interest loan to a poor woman from an underprivileged caste. She used the money to start a poultry business and was able to repay the loan in six months while retaining a 7,000 rupee net profit (LFP 2006).

Improved livelihood opportunities

As community forest managed resources have grown and legal provisions regarding harvest and sale have been enacted, business opportunities have developed through product sales and secondary processing. A study by the Asia Network for Sustainable Agriculture and Bioresources (ANSAB) showed 25 percent of household income in the Humla district was attributable to nontimber forest products (NTFPs) business relying on community forests (Subedi 1999). Kanel and Niraula (2004) calculated the total annual income to CFUGs at 1.9 billion rupees. However, only 3 percent of that amount went to direct support for the poor.

Women working in Lotka paper-making enterprise. Photo by: ANSAB

Another study reported that people with low incomes are getting more forest products, especially grasses, fodder, and fuelwood, in community forestry (Adhikari et al. 2007). Subedi (2006) found similar results, that enterprise development increased group revenues by 120 percent in the high mountain districts.

Businesses relying on community forest products for their raw materials have been operated by CFUGs and in the private sector. They provide much needed employment to rural households. Business opportunities relying on community forest products include sawmills, furniture manufacturing, and processing of nontimber forest products including medicinal herbs, Daphne paper making, allo handicraft production, and leaf plate making (Edwards 1996; Subedi et al. 2002). One furniture manufacturer working from wood grown on the Bhorkhore community forest is employing the seven poorest members of the user group (Acharya and Achary 2007).

Two community-run sawmills, established with assistance from the Nepal Australia Community Resource Management and Livelihood Project, are providing markets for CFUG logs and employment for CFUG members. Besides these community-run sawmills, there are many private sawmills throughout Nepal that are beginning to benefit from logs grown on community-managed forests (NACRMLP 2006). A successful example, a CFUG-based handmade paper business, is mentioned in Singh (2005). This enterprise established better collection practices of raw materials, had good financial management, and developed promising national and international market linkages. ANSAB has facilitated the certification of CFUG- and forest-based industry. This process has brought recognition to the CFUGs as managers of sustainable forests, and to the paper business as a socially acceptable and environmentally friendly paper producer (ANSAB 2006).

Often it is the wealthier members of society who benefit most from these value-added business opportunities (Malla et al. 2003). However, in hill districts, Subedi (2006) found improving trends in access for women and the disadvantaged in community forestry and forest-based enterprises after implementation of the enterprise-oriented community forestry program. This study points to an approach to be taken to poverty reduction and equity issues in community forestry.

Biodiversity Costs and Benefits

Community forestry has rightly been credited with the re-greening of the hills of Nepal. This is evident to anyone traveling through Nepal's mid-hills. A

study of eleven CFUGs by Yadav and Dev (2003) found that conditions had improved in all the forests studied. This agrees with a baseline forest resource assessment (Yadav and Branney 1999) and a hill livelihood baseline study (LFP 2006) that likewise found an overall improvement in forest conditions under community forestry management. A forest cover change analysis, conducted by the Department of Forests (2005) found forest cover increasing in the hills by an average rate of 0.06 percent per year.

Mikkola (2002) found that CFUGs were sensitive to the need to conserve wildlife and rare plant resources. The communities she studies had rules prohibiting the collection of certain species known to be locally endangered, or had certain no-collection areas allocated for conservation management. With the increase in nondegraded forest cover has come an increase in the quality of wildlife habitat. Villagers report more birds, mammals, and (somewhat disturbingly) more leopards and tigers in the vicinity (Malla et al. 2003). In the Sundari community forest, four rare and endangered species had noticeably increased in numbers following community management (White 2004). In another study, Pandey (2007) found comparatively higher tree species diversity on community-managed forest stands, but a poorer representation of older size classes. This finding is contrary to the results of Acharya and Gautam (2004) who found less tree species diversity on community forests, but a greater diversity of herbaceous plants.

All community forests benefit from the forest management controls imposed by the user groups. These controls include limiting grazing, guarding against illegal harvesting, and proactive management to promote the growth of high economic value species (Burch et al. 2003).

Sustainability Analysis

Community forestry in Nepal is being done on a national scale. It has a visible landscape presence and the forest user groups have changed, to some degree, village-level social interactions. One example of their resiliency under extreme conditions is the degree to which CFUGs continued to operate during the recent political difficulties in areas of Nepal under Maoist control. Although hindered in their ability to manage their forests, Rechlin et al. (2007) found that CFUGs did not disband, and, in fact, often took responsibility for health care and other social services normally provided by the government.

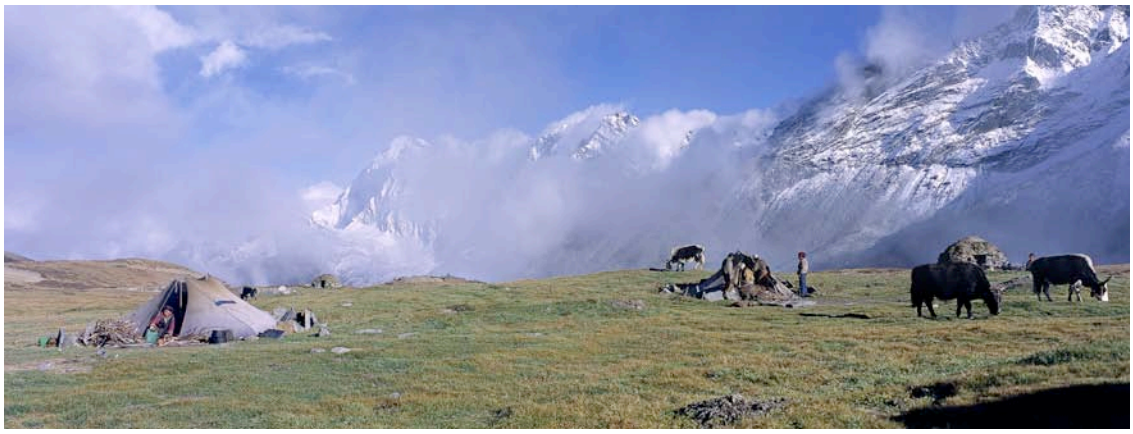
Social and environmental sustainability issues, however, do remain. Researchers are concerned with the tendency for village elites to usurp power within the user groups. This becomes more problematic as more money accumulates in the community bank account. Questions arise about equity in the distribution of benefits from those funds. If the poor and disadvantaged are increasingly marginalized from decision-making will they continue to

abide by the agreed upon harvest restrictions in the operational plan?

Likewise, there are concerns about the long-term biological sustainability of the prescribed silvicultural systems. Bhatta and Shrestha, in a 2007 study on litter removal practices, question the impact of aggressive harvesting on long-term nutrient budgets. They raise the question of the long-term ecological and biodiversity impacts of a management system that focuses solely on forest products, and look forward to a second generation of community forestry operational plans that include provisions for biodiversity enhancement and the maintenance of ecological services (Bhatta and Shrestha 2007). Similar concerns have been raised in other studies, with the possible conversion of natural forests to single species or limited species forests as CFUGs focus their attention on economically valuable timber species (Acharya et al. 2004; Pandey 2007).

ANSAB has initiated Forest Stewardship Council (FSC) certification to support environmentally, socially, and economically sustainable forest management in Nepal. As a coordinator, it has promoted several forums and loose networks that raised awareness and strengthened the capacity of national and local stakeholders to abide by the sustainable forestry requirements of certification (Subedi et al. 2004; Subedi 2005). Currently, a total of 21 CFUG-managed forests have been certified. Certification has generated significant cash benefits to CFUG members from the sale of forest products (Subedi 2005; Dahal 2006). Similarly, the participatory biodiversity monitoring practices, facilitated by ANSAB, produced positive changes in resource harvesting practices in the project areas (Burch et al. 2003). These are examples of activities that would promote sustainable community forestry in Nepal.

Forty percent of the Tibet Autonomous Region is now protected primarily through community-based conservation approaches.



Synthesis of Cases, Literature Review, and Professional Experience

Community-base conservation is a lot more complex and continually shifting than traditional top-down management driven by biological science. Cautious optimism coupled with an expectation of continued work is the precondition if the community-based approach is to be used.

Synthesis of Cases, Literature Review, and Professional Experience

In this section we answer questions posed in the Introduction about the effectiveness, benefits, as well as costs of community-based conservation. Doing this we draw on the cross-cutting points identified in the literature review, relating them to the four case studies, and synthesizing them through an analytical integration of resource management, biodiversity conservation, economic costs and benefits, social costs and benefits and the overarching issue that is the ultimate purpose of conservation: sustainability. To do this synthesis we draw on the extensive conservation experience of the authors, as each of us has three decades of fieldwork in community-based conservation work, in a number of U.S. settings as well as extended international experience in Nepal, India, and China.

Resource Management

The question of the appropriateness of involving community in conservation or natural resource management is answered by the failures in the traditional approach. The professional conservation model, often driven by outside science, has enough failures behind it as to suggest that it provides unpredictable results. Simply putting in more money and more science does not fix the problems once they start, and the problems almost always are coming from communities who feel isolated from management. It is as yet unclear how to engage communities in resource management, but it is not in doubt that they must be included.

Nepal's experience is typical of a global trend, perhaps the main difference being that Nepal ventured somewhat earlier (about thirty years ago) into community-based experiments—and hence the Nepal situation is excellent history to look at. Nepal moved into community forestry because those in charge saw no other choice; it did so also with community-based buffer zone management in its national parks and protected areas. After an earlier nationalization and centralization of both forests and parks, the government concluded that the many small patches of land over the landscape and the many isolated parks because of the mountains could not be centrally managed. The until-then Nepali top-down approach, modeled after the U.S. Forest Service, where management was delegated entirely to the professionals, was leading to a perceived environmental disaster. Nepal's early national parks, first heralded by World Wildlife Fund and others as global pioneers, underwent similar restructuring to engage community. The wisdom of this move, both in parks and in community forests, has been shown across the last decade of near-rising domestic instability. The Maoists even used national parks and forests as hideouts, but community engagement has generally allowed resource protection to continue while government-based management crumbled.

Similarly, professional-based management of salmon and most other fish stocks have driven fish populations many times to the point of near extinction. As the

"tragedy of the commons" is played out in the oceans, issues of community engagement with stocks and their habitats is ignored to a striking degree. Likewise, poaching from game preserves in Botswana pointed out the inability of government officials to manage wildlife habitats and populations.

Traditional conservation approaches (e.g., creating nature preserves) worked well in an "empty" world, one with vast tracks of wilderness and relatively small human populations. In today's world though, a world of 6,649,117,969 people that is rapidly counting upward, this growing number of men, women, and children has growing appetites for natural resources. There is no more space for large set-asides of protected land. In order for conservation to work, conservationists must "cut a deal" with local people. Community-based conservation is the only choice. Although knowledge is not yet at hand for how to do it, it is clear an imperative has come to figure out how to make partnerships with the people work. The examples given earlier in this review speak of the potential durability of community-based conservation—but they give little clear guidance as to how to implement it.

Economic Costs and Benefits

The literature shows clearly the benefits derived from community-based conservation. For community members to "buy in," though, they must see direct benefit to themselves and their collective community. Conservation, by definition, implies conserving, saving for the future. Saving entails sacrificing what you could have now for a perceived future benefit. There has to be a clear future payoff for community-based conservation to work in terms of income opportunities, development benefits, or in some way trading conservation for the life improvements that people want in education, health care, and income or the less tangible returns of a higher quality of life from an intact environment.

In Nepal, interest in protecting community forests went to scale, with one out of every four Nepalese in a forest users group, only when the benefits became visible. Some villages entered the program early. When their protection efforts began to pay off in terms of products and profits, surrounding villages jumped on board. In the Seed-Scale parlance of Future Generations projects that offers a methodology for community-based engagement, these early villages became Scale Squared Centers, places where others come to learn and spread the successful innovation, and, equally important, places of experimentation as ideas became adapted to fit local solutions.

One point that is clear about community-based conservation is that external ideas need to adapt to local conditions. But such adaptation does not reliably happen on its own; there is an important role for a three-way partnership of top-down forces and outside-in stimulus in order to allow the bottom-up to grow.

As pointed out in the Puerta al Mundo Maya tourism project in Guatemala, a lack of marketing is a limitation on the success of that project. Communities need help not only in management—but also in taking their experience and successes outward. Similar reports are found throughout the community-based ecotourism literature that has been cited. Good community-based eco-tourism products can be developed, but without an inflow of tourists to the area, which takes external help, the community benefits in terms of income generation are, obviously, minimal and of value only as show pieces. Once again, the value of partnerships with the top-down and the outside-in are evident if the bottom-up is to succeed.

The benefits to local people from engaging in partnership do not have to be solely economic. Many studies reviewed for this paper point to indirect noneconomic benefits from conservation, in terms of increased quality of life, or cultural and spiritual benefits, as at least as important as economic returns. Local people value their environment, perhaps not in biodiversity or in scientific ways, but they have deep connections that can be accentuated as benefits. Studies referenced in the salmon case study show that people living in that region value salmon more for their cultural significance than for their taste. Pacific Northwest watershed councils have brought diverse groups together not to increase the annual catch to some trawler but to improve the habitat for salmon in their backyard. In a related study by the authors on the century old forestry practices of the Menominee Indian tribe of Wisconsin, arguably one of the most impressive examples of conservation by communities in the United States, the question was asked why the Indian tribe refused to harvest valuable large trees from their forests. The simple answer was that "the Menominee like big trees." The people in the Pacific Northwest "like salmon." By including people in conservation efforts, going right to values in the hearts of people invested in that area, such noneconomic benefits to the community become powerful bases to advance conservation goals.

Social and Community Impacts

Every community-based conservation project needs management. Conservation, like any action, requires leadership—and how leadership is structured is as key to conservation as it is in business or politics. In brief, the better the management group in its internal functioning, and its engagement with the community, the more effective the conservation.

In Guatemala they are community tourism associations, in Nepal management is by forest user groups, in Botswana management is by local community trusts or CBOs, and in the Pacific Northwest they are watershed councils. In fact, in Nepal community forestry languished under the government controlled Panchayat protected forest system. The energy the program at first seemed to embody only came to light with the shift to the new social institution of the forest users group.

Of course communities have been managing their natural resources for a long long time. Often their natural resource management slowly moved into the hands of the powerful, and while there are exceptions such as the Menominee Indians, typically the entrenched groups have used the land for personal wealth—conservation may have been being achieved but there were serious social costs and significant antagonism. (The case of Robin Hood vis à vis the nobles who held the forests as private preserves being a universally known example.) Thus, new social institutions, it seems, may be the wiser management option rather than traditional ones, although there is yet no definitive proof in the literature. Although older systems can be restructured, in all the case studies referred to, it was decided to create new social institutions within the community and now groups formed specifically for a conservation management purpose seems to be the norm.

Village society is often staid, where everyone knows their caste or social status, and where societal norms and relations are firm. Conservation programs most often are initiated by outside agents, adding on that agenda also an egalitarian social set of values. Management often proactively calls for women and minority groups, features that the literature confirms add durability to the conservation as well as serving a social agenda, but it must be recognized that now dual objectives are underway—and frequently it is this social agenda that causes, particularly, push-back from communities, as what is being presented is challenging power bases within traditional society.

The answer to this problem is not to avoid the social agenda—for it truly makes conservation more effective—but rather for conservationists to learn best practices in social change. The inclusion of women in decision making is a recognized social benefit of the project in Guatemala. In Nepal, one of the first activities undertaken by forest user groups is to build an assembly hall, where "caste is left at the door." Watershed councils in rural Washington and Oregon gather diverse segments of society where individuals and organizations from different political and social agendas find themselves working together instead of defending positions. Conservation is not separate from. but very much part of modern social change. The community-based approach makes this clear and provides a process to make it happen.

Reviewing the literature, one common theme is a distrust of the government, meaning a distrust of a distant national government and its local representatives. Village folks do not like being told what to do by outsiders, and frequently what they are told does not make local sense. Improved management needs to connect communities to governments as well as outside agencies. The management way around this, as has been noted, is the Seed-Scale three-way partnership between community (bottom-up), government or authority structures (top-down), and NGO technical experts and researchers (outside-in) (Taylor-Ide 2002). Creating such partnerships was at the success of Future Generations community-based Pendeba program in the Qomolangma (Mt. Everest) National Nature Preserve in Tibet. Here, local workers (bottom-up) address village needs in exchange for training and support (outside-in) under supportive government policies (top-down). Within this

framework, development benefits to villages are tied to restrictions on poaching and timber cutting—partnership is created rather than more customary confrontation.

A major social benefit to a community-based conservation project is local level capacity building. Successful projects empower local institutions and build capacity for communities to engage in partnership effectively with the outside. (Communities which exist in nondemocratic societies require very different partnership approaches from those presumed by typically Western oriented conservation professionals.) An example of this is FECOFUN, the regional and national association of forest user groups in Nepal, where local chapters band together using traditional governance structures, adjusting for caste and power relationships, to provide training for individual user groups and to represent common interests in national politics. Such forest user groups have been very successful as an influential force of grass roots democratic action in Nepal as well as for maintaining social services during the Maoist rebellion. Capacity building is also part of the success of the Puerta al Mundo Maya project in Guatemala with the capacity of local people to develop successful tourism-related business enterprises and the capacity of community tourism associations to initiate and implement local development projects. Lack of attention to capacity building is a shortfall in the CBNRM project in Botswana, where lack of financial skills with the CBOs and insufficient institutional controls to prevent powerful segments from monopolizing control and gaining financial benefit threaten the entire CBNRM system.

Currently most projects seeking to implement community-based conservation are doing so with site-specific approaches, ones that recognize what needs to be done and try to evolve local approaches. The Seed-Scale methodology proposes a universal process that creates locale-specific solutions that integrate conservation management with community development. This methodology is being tested by Future Generations in community-based conservation projects in Tibet/China, Bhutan, and India. It may, in time, provide a solution to questions remaining about the implementation of community-based conservation.

Biodiversity Conservation

In terms of the crucial question, "does community-based conservation further conservation goals?" all four case studies examined provide evidence of ways the answer to this question is "yes." National and international organizations can do much to support conservation and biodiversity protection, but if the folks living next door do not do it, the action just will not get done. Conservation is inherently a local endeavor. The literature shows that communities can be strikingly effective at enforcing locally determined regulations. When communities buy into conservation goals, they bring knowledge and local resources (the most important of which are surveillance and social controls) to add to the resources and knowledge of external partners. One astonishing revelation from the evolution of community forestry in

Nepal was the recognition that barbed wire fences were not needed around a plantation if everyone in the community agreed not to let their goats eat the trees. Costs came down and results went up, while if the community did not become engaged no fence was strong enough to keep the goats out.

Similarly, some of the best examples of wildlife management in Africa are not found in walled off national parks, but in community-managed lands open to community-monitored hunting.

In Guatelama, the Puerta al Mundo Maya project has successfully zoned lands, replacing slash and burn agriculture and plantation monocultures with biologically rich forest gardens. Nepal saw a landscape level regrowth of forests across the nation with an accompanying return of wildlife, and a healthy hydrologic cycle reducing erosion and refreshing springs, due to its community forestry program. Much of the pyramid of animal species is being restored in some Nepali valleys, from once endangered plants to snow leopards—and that in a country where the population continues to rise. By contrast, a confrontational approach in the context of rising population would have been viewed as taking resources from the people—and the people would have found numerous ways of undermining any form of enforcement.

To select an area of Moore Foundation priority that this review examined, we have reason to believe that a similar rejuvenation of natural resources could occur with community-based management of salmon stocks in the Pacific Northwest. Additionally, to turn to another Moore Foundation area, the rapid expansion that occurred in Peru of Future Generations health-related work (where activities now cover one-third of the population where local communities were once antagonistic to services that on the face of it they would presumably want) suggests that genuine community partnerships regarding the environment might also be equally successful.

Probably the two greatest U.S. examples of biodiversity conservation success associated with community-based conservation are in the Adirondack State Park of New York and in the legacy of the Hudson River Fisherman's Association. The Adirondacks is a six million acre state park with a resident population of over 100,000 people (three times larger than Yellowstone and equal in size to the whole state of Massachusetts). Land use regulations are enforced through the Adirondack Park Agency, which has only *two* enforcement officers. The Park is featured by environmental author Bill McKibben in his book *Hope, Human and Wild* (2007) as a center of rebirth of the great northern forest, with all its biological components including beaver, moose, and maybe even now wolves and cougars. In a similar argument, John Cronin and Robert F. Kennedy, Jr., in their book *The River Keepers* (1999), credit the genesis of important modern day environmental legislation not with national advocacy groups or state agencies charged with protecting the environment but with an association of commercial and recreational fisherman, the Hudson River Fisherman's Association, who were upset with what industry was doing to *their* river. This is "villagers" on the banks of the Hudson River,

community members who got organized, utilized their connections to powerful politicians, and changed or forced the enforcement of national environmental laws.

Sustainability Analysis

The question to answer here is "how sustainable are community-based conservation options." In Botswana, as in other places, high expectations are being replaced by cautious optimism. The community-based tourism project in Guatemala, while working, does not seem to be achieving its full potential, especially with regards to its poverty alleviation goal. Nepal forestry has gone to scale, and has a national organization to advocate for community forestry, but "second generation" issues are beginning to pop up. What appears to be coming clear is that the beginning in these instances is promising, but that further adaptation needs to be done. Community partnership is not a one-time thing; their expectations constantly change, and hence so must management.

The literature points to several "second-generation" issues to address as well as the "first-generation" issues. First is the concept of community. Development practitioners tended to take a simplistic and somewhat idyllic view of community as a harmonious village setting. In reality, community is politically and socially complex. Community is not a monolithic whole or uniform identity, and time is needed to understand the complex interrelations in implementing community-based conservation projects. Within a village are caste, religious, socio-economic, gender, and outright power relationships that have the potential to roil the waters under a calm surface. To succeed, community-based conservation has to be seen by the community as treating all fairly, with distribution of benefits not excluding some segment of society.

Communities also come with a history that needs to be considered, as well as established relationships with the outside world. Engaging all these various aspects is essential, as they impact sustainability in major ways. The sustainability of the Botswana project is threatened by lack of attention to just those considerations. CBOs received a lot of money from safari contracts, with some communities and individuals benefiting more than others. The government's solution was to recentralize control, taking sixty percent of the revenue back to be redistributed with increasing equity.

Community-based conservation is a lot more complex and continually shifting than traditional top-down management driven by biological science. Cautious optimism coupled with an expectation of continued work is the precondition if the community-based approach is to be used.

Key to sustainable community-based conservation projects is adaptability. At the center of the Seed-Scale approach is engaging communities as partners with government and outsiders, while learning by doing, using annual reviews and work

plans. Regrettably, one of the consistent failures of community-based conservation approaches is that they are not truly partnerships—what is termed often as "community participation" is quickly seen through by communities as "community manipulation," with the result that they do not join as partners, but in very defensive ways to avoid being manipulated. Adaptability is needed, taking small steps so as to build partnership where it did not exist. This iterative approach allows initiatives to grow and adapt to existing and changing conditions.

Another key is recognizing the importance of local knowledge coupled with scientific and technical knowledge from outside forces. Local knowledge brings buy-in from the community, often the more marginalized segments, while outside knowledge and ideas can spark the change necessary to find solutions to complex community-conservation issues.

"Please take great care of our green home," a signpost by the people of the Four Great Rivers protected area in southeastern Tibet, China.

Conclusion

Providing clarity for how to do community-based conservation arguably is the most important challenge in conservation after global climate change.

Conclusion

Community-based conservation is a fundamentally different approach from what the community-based literature sometimes terms "the fortress" approach. The difference is one of partnership rather than confrontation. Ultimately community-based conservation will show itself as the more general system, and the professional approach will be used in special situations to protect defined smaller areas.

With only a few nay-saying articles, the literature almost uniformly endorses community-based conservation, but at the same time it gives scant guidance as to how to do it. A near consensus appears to want community-based to be the way, but after that follow few recommendations on implementation. Thus, much of the literature focuses on descriptive issues rather than prescriptive.

Providing clarity for how to do community-based conservation arguably is the most important challenge in conservation after global climate change. Research is needed—and that is unlikely to be productive in a vacuum. Rather, what probably needs to occur is to select from the global diversity of projects that are now growing worldwide, the best examples—and then to carefully monitor these (as would be done in operations research in industry) for their principles and processes.

This will require new partnerships with new conservation groups that are by their design community-based. The modern world has entered an era where the scope of conservation action has grown so critical that conservation is no longer an activity to be done by scientists and government alone. People are both the problem and the solution, and there are groups with great experience in this realm. Likely there are some universal processes, but the literature is not yet in agreement as to what the processes are. Those processes need to be discovered.

The "community" in community-based conservation introduces a constantly shifting complexity that is unsettling. Community-based conservation: the idea is clear but the parameters defining the idea have to be defined for every place and time. This is unlike conventional science-based conservation that has agreed on it definitions, for example biodiversity has known ways of measurement or national parks have clear assessment tools. But to measure the interrelationships of communities interacting with protected areas expertise is needed to determine first what needs to be measured and then how to measure these variables. Measuring conservation alone is not adequate, for community-based conservation is grounded in a synergy between people and protection; looking at one half or the other is to miss the dynamic of interactive empowerment which is what community-based conservation is all about. Measuring conservation effectiveness is always difficult—and now it is many times more complicated by introducing people to the challenge.

It is clear that people and protection must work in harmony. Community-based conservation is how we shall create the future. The way that Earth—whether as planet or a small piece of earth—will be protected is by bringing participants into its conservation. Nature and the planet cannot only be protected by locking it off into

parks where people come as visitors. Nature is not the wonderfully diverse taxonomies of species but rather it is the interaction of those species—of which *homo sapiens,* the "wise man", is one. The task ahead is not so much protecting genes, not protecting places, (though these must occur) but even of greater importance is conserving the island in Space on which we live.

The conservation challenge requires working out a community-based approach even though it is very clear now, as this literature review indicates, that how to do community-based conservation is still unclear. Methods must be worked out, for all of humanity's cultural systems. It must be able to operate in all of Nature's ecological systems. Only when such a process is worked out will understanding have evolved that allows the planet and its people to have a sustainable future.

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APPENDIX I. ANNOTATED BIBLIOGRAPHY

Findings

While many insights emerge from the research listed below, two themes are worth calling to the fore. The first is the near-universal embrace of the language of community participation in conservation, development, and natural resource management projects, juxtaposed against persistent critiques that these programs' practice is unable to match their rhetoric. Thus, much of the research below highlights the need to find means of translating the rhetoric and theory behind community-based conservation into effective, on-the-ground conservation. A second, related theme has to do with the status of "community" itself. As the projects dealing with gender, caste, ethnicity and socio-economic distinctions particularly illustrate, any given community is not a monolithic entity and cannot be effectively engaged without considering these distinctions. Thus, much of the research below points out the importance of understanding dynamics within specific communities, and engaging a broad spectrum of community participation.

Notes on Included Works

The goal of this bibliography is to indicate the most recent research in community-based conservation practices. Thus, the vast majority of included works are journal articles, which, given a shorter time in press, tend to present the most up-to-date work. Furthermore, only studies involving scientific methods, and integrating communities with "modern" intentional conservation efforts, have been included. The large (and important) bodies of scholarship on indigenous or traditional knowledge and traditional or indigenous conservation practices have been included only where these studies intersect with scientific community-based conservation. Similarly, research concerned with local people's perceptions of conservation practices has been included primarily where it applies to community-based conservation, or compares community-based with other approaches, and has otherwise been excluded.

Coding

Some entries have been numerically coded to indicate the degree of role of the community in the project. This has only been included in cases where it could be clearly judged and which reflected specific projects.

Participation scale: (1) Outside Control; (2) Participatory; (3) Partnership; (4) Devolution; (5) Full Community Control; (1/5) Dominance/Resistance. Lack of

number indicates N/A.

All quotes taken from abstract unless otherwise noted.

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Adams, William M., and Mulligan, Martin. *Decolonizing Nature: Strategies for Conservation in a Postcolonial Era.* London and Sterling VA: Earthscan Publications, 2006.

Bringing together fields ranging from ecology, geography, and applied conservation to environmental philosophy, this edited volume attempts to answer the question, "Does decolonization have any significance for conservation?" (1). These arguments have significant bearing on community conservation practice, in unpacking the colonial legacies dealt with by communities in many parts of the world. It also highlights the implications of shifts in thinking, such as the turn away from "equilibrium ecology," in which ecosystems are understood as progressing to a point of static balance unless interfered with by humans, in favor of an understanding of dynamism and change as ecosystems' natural state.

Adams, W.M., Aveling, R., Brockington, D., Dickson, B., Elliott, J., Hutton, J., Roe, D., Vira, B., and Wolmer, W. "Biodiversity Conservation and the Eradication of Poverty." *Science* 306 (5699), 1146–1149, Nov. 12, 2004.

Presents the need to clear conceptual frameworks to evaluate potential for addressing the widely recognized need to combine poverty alleviation and conservation, and the potential of community-based approaches. Reviews linkages and presents a "conceptual typology" of the relationships between these dynamics.

Adams, W.M., and Infield, M. "Who Is on the Gorilla's Payroll? Claims on Tourist Revenue from a Ugandan National Park." *World Development* 31 (1), 177–190, Jan. 2003.

Evaluates the revenue flows from wildlife tourism, the competing claims upon it, and tension between rhetoric and practice in its dispersal. Argues that "financial flows to local communities do reduce their sense of grievance at the park's creation, but do not compensate them for the costs of park creation. Different interests within and outside Uganda compete for wildlife tourism revenue and limit its capacity to fund the direct and indirect costs of gorilla conservation."

Adhikari, Bhim, Williams, Frances, and Lovett, Jon C. "Local Benefits from Community Forests in the Middle Hills of Nepal." *Forest Policy and Economics* 9 (5), 464–478, Jan. 2007.

A survey based on interviews with 309 households after 20 years of community-based forestry projects. Finds that harvesting of forest products and quantity of trees on private land has increased, while livestock herds have decreased.

Agrawal, A., and Chhatre, A. "Explaining Success on the Commons: Community Forest Governance in the Indian Himalaya." *World Development* 34 (1), 149–66, Jan. 2006.

In an attempt to develop more rigorous and accurate means of determining likelihood of success in community forest projects, this project offers "context-sensitive statistical analysis of 95 cases of decentralized, community-based forest governance in Himachal Pradesh, and showing how a range of causal influences shape forest conditions in diverse ecological and institutional settings in the Indian Himalaya."

Allendorf, Teri, Swe, Khaing Khaing, Oo, Thida, Htut, Ye, Aung, Myint, Allendorf, Keera, Hayek, Lee-Ann, Leimgrubek, Peter, and Wemmer, Chris. "Community Attitudes toward Three Protected Areas in Upper Myanmar (Burma)." *Environmental Conservation* 33 (4), 344–352, Dec. 2006.

A survey of people living near protected areas (PAs), finds that "focus on conflicts to understand people's attitudes toward PAs may undervalue or miss critical positive perceptions that people hold. Understanding local residents' perceptions of PAs makes possible the creation of strategic, place-based management strategies that build on people's positive perceptions and mitigate their negative perceptions."

Antinori, C. "Community Forest Enterprises as Entrepreneurial Firms: Economic and Institutional Perspectives from Mexico." *World Development* 33 (9), 1529 1543, Sept. 2005.

Based on diverse examples from Mexico, argues that community forests are quite capable of operating in competitive markets at various levels of vertical integration, and are able to offer both economic equity and environmental sustainability.

Arjunan, M., Holmes, C., Puyravaud, J.P., and Davidar, P. "Do Developmental Initiatives Influence Local Attitudes Toward Conservation? A Case Study from the Kalakad-Mundanthurai Tiger Reserve, India." *Journal of Environmental Management* 79 (2), 188–197, April 2006.

Survey of villagers living in vicinity of park 6 years after World Bank funded eco-development project on attitudes toward tigers, the forest, and the Forest Department. Finds that while the poorest people feel positively about tiger conservation as it does not affect their livelihoods, many villagers—both rich and poor—had negative feelings about forest conservation and the Forest Department as these restricted their access to forest products. Thus, concludes that the eco-development project had not adequately addressed local interests and concerns.

Armitage, D. "Adaptive Capacity and Community-Based Natural Resource Management." *Environmental Management* 35 (6), 703–715, June 2005.

Attempts to unpack why some community-based natural resource management projects succeed and others fail, through studying "the relationship among adaptive capacity, community-based resource management performance, and the socio-institutional determinants of collective action, such as technical, financial, and legal constraints, and complex issues of politics, scale, knowledge, community and culture." Argues adaptive capacity is a conceptual weakness in many projects.

Arya, Swarn Lata. "Women and Watershed Development in India: Issues and Strategies." *Indian Journal of Gender Studies* 14 (2), 199–230, May-Aug. 2007.

Finds that "The soil and water conservation measures undertaken have failed to take into consideration the imbalance between men and women's ownership rights, division of labour and income." Argues for the full participation by women, judged not simply by numbers working on a given project, but by their ability to assert their specific needs and values. Thus, calls attention to need for broad participation *within* community, rather than simply thinking of "community" as a monolithic unit.

Aswani, S., and Lauer, M. "Incorporating Fishermen's Local Knowledge and Behavior into Geographical Information Systems (GIS) for Designing Marine Protected Areas in Oceania." *Human Organization* 65 (1), 81–102, Spring 2006.

Demonstrates how integrating indigenous knowledge into GIS "allows researchers to formulate hypotheses regarding human responses to inter-and intra-habitat variability, along with other marine ecological processes, and help in the designing and implementation of resource management strategies in a cost-effective and participatory way, bridging the gap between indigenous and Western cognitions of seascapes."

Aswani, S., and Weiant, P. "Scientific Evaluation in Women's Participatory Management: Monitoring Marine Invertebrate Refugia in the Solomon Islands." *Human Organization* 63 (3), 301–319, Fall 2004.

(3) Describes success of a community-based marine protected area, attributing success to the following elements: "1) the high level of participatory involvement and community leadership; 2) the local perception that shell beds have recovered rapidly and the role that scientific evaluation has played in reinforcing this notion; 3) a research program that is cross-fertilizing indigenous and scientific ecological knowledge; 4) the unique marine tenure system that allows for the project's development and the area's policing; and 5) the tangible economic incentives created by the development project, which ultimately empowers local women."

Austin, Rebecca L., and Eder, James F. "Environmentalism, Development, and Participation on Palawan Island, Philippines." *Society & Natural Resources* 20 (4), 363–371, April 2007.

(2) "Recent critiques suggest that CBRM [community-based resource management] has not been successful because communities lack self-sufficiency and claims of 'local participation' are merely rhetorical. We argue that analyses of CBRM should consider three aspects of Philippine environmentalism: whether rhetoric regarding resource management matches reality in the eyes of local residents; the overlapping roles of government and nongovernmental organizations (NGOs); and multiplex relationships of NGOs with local communities. Our findings suggest that despite some difficulties, stronger NGO roles in CBRM have generally resulted in better environmental protection, and through relationships with NGOs, communities in the Philippines can indeed take action to serve their own best interests."

Bajracharya, Siddhartha B., Furley, Peter A., and Newton, Adrian C. "Impacts of Community-Based Conservation on Local Communities in the Annapurna Conservation Area, Nepal." *Biodiversity and Conservation* 15 (8), 2765–2786, July 2006.

Based on interviews and questionnaires, study suggests that people living within ACAP report benefits primarily in the form of infrastructure and services. Only 14.9 percent report direct income from tourism, while 84 percent report some loss of crops or livestock to wildlife. This is countered at the moment by benefits, but article suggests that conflict with wildlife in the future is likely unless steps are taken.

Bajracharya, Siddhartha B., Furley, Peter A., and Newton, Adrian C. "Effectiveness of Community Involvement in Delivering Conservation Benefits to the Annapurna Conservation Area, Nepal." *Environmental Conservation* 32 (2), 239–247, Sept. 2005.

Combination of ecological assessments—particularly of tree cutting and wildlife populations—and social surveys. Finds that "ACAP has been successful in conservation benefits, which study attributes to: changing patterns of resource use and behaviour among local communities, increased control of local communities over their local resources, increased conservation awareness among local people resulting from environmental education, and the development and strengthening of local institutions such as Conservation Area Management Committees (CAMC)."

Balint, Peter J., and Mashinya, Judith. "The Decline of a Model Community-Based Conservation Project: Governance, Capacity, and Devolution in Mahenye, Zimbabwe." *Geoforum* 37 (5), 805–815, Sept. 2006.

(2) Examines a project that had been touted as a model CAMPFIRE success of community-based conservation, and finds sharp deterioration in conservation

effectiveness following national turmoil and lack of responsible government oversight. Argues that "even in apparently successful conservation and development projects, local participatory decision-making institutions are fragile and require continuing external support."

Balint, Peter J. "Improving Community-Based Conservation near Protected Areas: The Importance of Development Variables." *Environmental Management* 38 (1), 137–148, July 2006.

Argues that community-based conservation will be more effective if it focuses on development variables often believed to be beyond the scope of local conservation projects: rights, capacity, governance, and revenue.

Baral, Nabin, and Gautam, Ramji. "Socio-economic Perspectives on the Conservation of Critically Endangered Vultures in South Asia: An Empirical Study from Nepal." *Bird Conservation International* 17 (2), 131–139, June 2007.

A survey of rural Nepalese communities' practices relating to endangered vultures and receptivity toward conservation. "Ensuring healthy food through economic incentives, inculcating new values through environmental education and soliciting popular participation for habitat conservation are recommended."

Bawa, Kamaljit S., Joseph, Gladwin, and Setty, Siddappa. "Poverty, Biodiversity and Institutions in Forest-Agriculture Ecotones in the Western Ghats and Eastern Himalaya Ranges of India." *Agriculture Ecosystems & Environment* 121 (3), 287–295, July 2007.

Argues for the importance of attention to forest-agriculture ecotones as zones where biodiversity can be conserved through programs fostering environmentally sustainable community income generation. Emphasizes the need to develop and support institutions at the community level for this kind of approach to be successful.

Becker, C.D., Agreda, A., Astudillo, E., Costantino, M., and Torres, P. "Community-Based Monitoring of Fog Capture and Biodiversity at Loma Alta, Ecuador Enhance Social Capital and Institutional Cooperation." *Biodiversity and Conservation* 14 (11), 2695–2707, Oct. 2005.

Illustrates links between community involvement in ecosystem monitoring and rising social capital and interest in conservation and ecotourism.

Becker, C.D., and Ghimire, K. "Synergy between Traditional Ecological Knowledge and Conservation Science Supports Forest Preservation in Ecuador." *Conservation Ecology* 8 (1), Article no. 1, Dec. 2003.

(2) Presents a case study of the first community-based forest reserve in Ecuador, created in conjunction with NGOs Earthwatch Institute and People Allied for

Nature. Argues that "synergy between traditional knowledge and western knowledge can result in sustaining both ecosystem services and biodiversity in a forest commons."

Beger, M., Harborne, A.R., Dacles, T.P., Solandt, J.L., and Ledesma, G.L. "A Framework of Lessons Learned from Community-Based Marine Reserves and Its Effectiveness in Guiding a New Coastal Management Initiative in the Philippines." *Environmental Management* 34 (6), 786–801, Dec. 2004.

Notes that community-based reserves are often inefficient and proposes a framework for greater efficiency based on "lessons learned" in past projects. Framework focuses on the following points: "(1) an island location, (2) small community population size, (3) minimal effect of land-based development, (4) application of a bottom-up approach, (5) an external facilitating institution, (6) acquisition of title, (7) use of a scientific information database, (8) stakeholder involvement, (9) the establishment of legislation, (10) community empowerment, (11) alternative livelihood schemes, (12) surveillance, (13) tangible management results, (14) continued involvement of external groups after reserve establishment, and (15) small-scale project expansion." Then presents a case of a reserve established following the framework.

Berkes, F. "Rethinking Community-Based Conservation." *Conservation Biology* 18 (3), 621–630, June 2004.

Examines community-based conservation first in light of conceptual shifts in ecology and applied ecology pertaining to an understanding of ecosystems as complex adaptive systems. Then evaluates feasibility of community-based conservation in light of emerging interdisciplinary fields such as "common property, traditional ecological knowledge, environmental ethics, political ecology, and environmental history."

Balram, S., Suzana, D.E., and Dragicevic, S. "A Collaborative GIS Method for Integrating Local and Technical Knowledge in Establishing Biodiversity Conservation Priorities." *Biodiversity and Conservation* 13 (6), 1195–1208, June 2004.

Notes that conservation needs are too urgent to wait for full scientific analysis to fill current data gaps, and proposes integrating scientific and local or traditional knowledge using GIS.

Blaikie, Piers. "Is Small Really Beautiful? Community-Based Natural Resource Management in Malawi and Botswana." *World Development* 34 (11), 1942–1957, Nov. 2006.

Argues for the need for greater interface between donors, recipient governments, and participants in community-based natural resource management projects to ensure positive outcomes.

Borchers, Henning. *Jurassic Wilderness: Ecotourism as a Conservation Strategy in Komodo National Park, Indonesia.* Stuttgart: ibidem-Verlag, 2004.

Analyzes development of communities within Komodo National Park, Indonesia, and argues that ecotourism may only be a politically attractive slogan that provides conservation agencies with the political and economic justification for an exclusionary protected area management approach. Argues that instead of taking into account economic, social, and cultural concerns of local residents, a conservation regime that adopts ecotourism as a conservation strategy may ultimately leave local people struggling to meet their present needs.

Bouma, Jetske, van Soest, Daan, and Bulte, Erwin. "How Sustainable Is Participatory Watershed Development in India?" *Agricultural Economics* 36 (1), 13–22, Jan. 2007.

Compares watershed management devolution in four semi-arid regions in India. Finds that it is more effective in the short term, but that community investments fail to ensure maintenance and sustainability in the long term.

Bray, D.B., Merino-Perez, L., Negreros-Castillo, P., Segura-Warnholtz, G., Torres-Rojo, J.M., Vester, H.F.M. "Mexico's Community-Managed Forests as a Global Model for Sustainable Landscapes." *Conservation Biology* 17 (3), 672–677, June 2003.

Notes that more than half of Mexico's forests have been in community hands since the Mexican Revolution (1910), evaluates the success of these community forest enterprises, and their potential to serve as models for forest management devolution worldwide.

Brosius, J. Peter. *Communities and Conservation: Histories and Politics of Community-Based Natural Resource Management.* Lanham MD: AltaMira Press, 2005.

Analyzes potential and advocates for community-based natural resource management (CBNRM) through providing a transnational overview and tracing links between environmental management and social justice agendas.

Browder, J.O. "Conservation and Development Projects in the Brazilian Amazon: Lessons from the Community Initiative Program in Rondonia." *Environmental Management* 29 (6), 750–762, June 2002.

(3) Presents evidence from the "Community Initiative Program (CIP), a pilot program of the Rondonia Natural Resources Management project (PLANAFLORO) in the western Brazilian Amazon state of Rondonia," which "attempted to apply the

principles of ICDP to the regional scale involving numerous different communities in one program simultaneously." Finds that while results are mixed, counties with the highest concentrations of CIP programs showed lower rates of deforestation, while 50 percent of projects demonstrated tangible economic benefits to their communities.

Bryden, John, and Geisler, Charles. "Community-Based Land Reform: Lessons from Scotland." *Land Use Policy* 24 (1), 24–34, Jan. 2007.

Argues that community-land reform projects need to take more account of "community strengthening as an end in itself."

Budhathoki, P., "Linking Communities with Conservation in Developing Countries: Buffer Zone Management Initiatives in Nepal." *Oryx* 38 (3), 334–341, July 2004.

Emphasizes the disconnect between the rhetoric of community-based conservation and actual practice. Emphasizes need to integrate equity, empowerment, benefit sharing and gender issues into community-based management of buffer zones around protected areas.

Campbell, Lisa M., Haalboom, Bethany J., and Trow, Jennie. "Sustainability of Community-Based Conservation: Sea Turtle Egg Harvesting in Ostional (Costa Rica) Ten Years Later." *Environmental Conservation* 34 (2), 124–131, June 2007.

(2) An evaluation of "the durability and flexibility of the incentive, legal and administrative structures associated with a successful example of CBC" [community-based conservation]. Survey finds animosity toward government agencies and concern about possible tourism impacts on egg harvesting, but supportive feelings about conservation.

Campbell, L.M., and Vainio-Mattila, A. "Participatory Development and Community-based Conservation: Opportunities Missed for Lessons Learned?" *Human Ecology* 31 (3), 417, Sept. 2003.

Presents genealogy of terms and comparative overview of the fields of participatory development and community-based conservation, based on literature review and authors' field experience in both fields.

Campbell, M.C., and Salus, D.A. "Community and Conservation Land Trusts as Unlikely Partners? The Case of Troy Gardens, Madison, Wisconsin." *Land Use Policy* 20 (2), 169–180, April 2003.

Notes that despite the increased popularity of nonprofit land trusts, and the collaboration of these with government, conservation trusts and community trusts

rarely collaborate with each other. Presents case in which these have collaborated to mutual benefit.

Caputo, F.P., Canestrelli, D., and Boitani, L. "Conserving the Terecay (Podocnemis uinifilis, Testudines: Pelomedusidae) Through a Community-Based Sustainable Harvest of Its Eggs." *Biological Conservation* 126 (1), 84–92, Nov. 2005.

Articulates possibility of an incentive-based program of turtle conservation centered on offering rewards for hatchlings, and thus making a healthy population an economic boon to local people who otherwise hunted the turtles for food.

Cardenas-Torres, Nirari, Enriquez-Andrade, Roberto, Rodriguez-Dowdell, Natalie. "Community-Based Management through Ecotourism in Bahia de los Angeles, Mexico." *Fisheries Research* 84 (1), 114–118, March 2007.

(2) Study led to implementation of "code of conduct" for human/whale shark interactions, and argues for importance of community-based initiatives in ongoing whale shark conservation projects.

Castillo, A., Torres, A., Velazquez, A., and Bocco, G. "The Use of Ecological Science by Rural Producers: A Case Study in Mexico." *Ecological Applications* 15 (2), 745–756, April 2005.

Compares academic and community perspectives on the utilization of scientific knowledge in integrative forest management. Argues that, especially in developing countries, ecological scientists "should regard rural communities as key ecosystem managers and should respond-to their needs and demands in order to convert pure scientific findings into wise environmental decisions."

Chan, Kai M.A., Pringle, Robert M., Ranganatran, Jai, Boggs, Carol L., Chan, Yvonne L., Ehrlich, Paul R., Haff, Peter K., Heller, Nicole E., Al-Krafaji, Karim, and Macmynowski, Dena P. "When Agendas Collide: Human Welfare and Biological Conservation." *Conservation Biology* 21 (1), 59–68, Feb. 2007.

A "state of the field" survey looking at community-based conservation and ecosystem services research as means to reconcile goals of biodiversity conservation and human benefit. Argues that neither paradigm provides a "silver bullet"—especially because biodiversity conservation does not always benefit human interest. Makes three overarching claims: "(1) Conservation research needs to integrate with social scholarship in a more sophisticated manner; (2) Conservation must be informed by a detailed understanding of the spatial, temporal, and social distributions of costs and benefits of conservation efforts. Strategies should reflect this understanding, particularly by equitably distributing conservation's costs; (3) We must better acknowledge the social concerns that accompany biodiversity conservation; accordingly, sometimes we must argue for conservation for biodiversity's sake, not for its direct human benefits."

Chen, Z.G., Yang, J.Y., and Xie, Z.Q. "Economic Development of Local Communities and Biodiversity Conservation: A Case Study from Shennongjia National Nature Reserve, China." *Biodiversity and Conservation* 14 (9), 2095–2108, Aug. 2005.

Offers data on population growth and economic change, coupled with stresses on biodiversity and argues for the importance of mechanisms such as "Public Compensation, and Community Co-management" in order to meet coming stresses indicated in research.

Cinner, J.E., Marnane, M.J., and McClanahan, T.R. "Conservation and Community Benefits from Traditional Coral Reef Management at Ahus Island, Papua New Guinea." *Conservation Biology* 19 (6), 1714–1723, Dec. 2005.

(5) Conducts census of fish in area protected by tribal group for generations, where community harvests only three times per year for ceremonial purposes. Finds healthy fish population undiminished by the harvests and attributes compliance with restrictions to "perceived legitimacy, its ability to provide the community with direct and indirect benefits, and its reflection of local socioeconomic circumstances."

Coomes, O.T. "Rain Forest 'Conservation-through-Use'? Chambira Palm Fibre Extraction and Handicraft Production in a Land-constrained Community, Peruvian Amazon". *Biodiversity and Conservation* 13 (2), 351–360, Feb. 2004.

Uses household survey data to characterize handicraft production using nontimber forest products. Findings "question the promise of rain forest 'conservation-through-use' and indicate the scope of challenges for species conservation, particularly among the rural poor."

Crawford, B., Kasmidi, M., Korompis, F., and Pollnac, R.B. "Factors Influencing Progress in Establishing Community-Based Marine Protected Areas in Indonesia." *Coastal Management* 34 (1), 39–64, Jan.-March 2006.

Provides empirical analysis of 24 villages involved in early stages of community-based "no-take" marine protected areas to determine factors affecting success. Determines that key factors are: "village complexity, level of development, project input levels, characteristics of community organizers, and degree of community organizer homophily relative to the community."

Crawford, B.R., Siahainenia, A., Rotinsulu, C., and Sukmara, A. "Compliance and Enforcement of Community-Based Coastal Resource Management Regulations in North Sulawesi, Indonesia." *Coastal Management* 32 (1), 39–50, Jan.-March 2004.

Using both socioeconomic theory of resource management compliance and empirical data on the status of hard coral cover in marine sanctuaries, the article evaluates several community-based conservation projects' ability to enforce regulations. Finds that communities are especially effective at enforcing locally determined regulations, and that a co-management approach is preferable for effective enforcement and compliance.

Curtin, C.G. "Integration of Science and Community-Based Conservation in the Mexico/U.S. Borderlands." *Conservation Biology* 16 (4), 880–886, Aug. 2002.

(3) Presents a community-based conservation collaboration based on peer-reviewed science. Argues that "sustaining ecosystem processes in the face of climatic variability requires a sound foundation of monitoring and research and a good working relationship between people and organizations with diverse goals and interests" and emphasizes the compatibility between this collaborative process and rigorous scientific research.

Dalle, S.P., de Blois, S., Caballero, J., and Johns, T. "Integrating Analyses of Local Land-Use Regulations, Cultural Perceptions and Land-Use/Land Cover Data for Assessing the Success of Community-Based Conservation." *Forest Ecology and Management* 222 (1-3), 370–383, Feb. 15, 2006.

"In this paper, we demonstrate that an analysis of locally recognized land-use rules and regulations embedded in local institutions can inform remote-sensing approaches by helping: (1) to elucidate some of the local perceptions, criteria and interactions with outside agencies that drive conservation actions and (2) to better interpret the spatial patterns of land-use change and forest conservation revealed by remote-sensing data." Goes on to suggest need for future research on less valued forest types for biodiversity conservation.

de Castro, F., and McGrath, D.G. "Moving Toward Sustainability in the Local Management of Floodplain Lake Fisheries in the Brazilian Amazon." *Human Organization* 62 (2), 123–133, Summer 2003.

In order to shed light on the elusive success of community-management in meeting social and conservation objectives, paper studies 77 fishing documents produced between 1981 and 1997 examining "approaches to resource management revealed in the accords, the institutional arrangements for implementing them, and evaluate the performance of these accords over this 15-year period."

Dhakal, Bhubaneswor, Bigsby, Hugh R., and Cullen, Ross. "The Link Between Community Forestry Policies and Poverty and Unemployment in Rural Nepal." *Mountain Research and Development* 27 (1), 32–39, Feb. 2007.

Evaluates effect of forest-based income from forest-management approaches that limit community forest usages for agricultural purposes such as fodder. "Based on

data from 259 households in 6 community forest user groups in 3 hilly districts (Dolakha, Kavre, and Nuwakot), the results show that the resources available from private lands and community forests under current policies are inadequate to fully utilize the family labor force of many rural households, and are insufficient to generate a bare subsistence income for the poorest households…a more flexible agroforestry model could overcome rural unemployment problems and increase incomes while ensuring sustainable resource use from the forests."

Drew, J.A. "Use of Traditional Ecological Knowledge in Marine Conservation." *Conservation Biology* 19 (4), 1286–1293 Aug. 2005.

Begins by "dissagregating" traditional ecological knowledge, "TEK," into its "constituent parts," showing how its local specificity can contribute to conservation efforts. Also points out that this kind of integration and exchange also provides a means for local people to develop a "scientific infrastructure."

Du Toit, J. "Wildlife Harvesting Guidelines for Community-Based Wildlife Management: A Southern African Perspective." *Biodiversity and Conservation* 11 (8), 1403–1416, Aug. 2002.

Article "draws together key ecological issues of relevance to CBWM in southern African savannas and identifies topics requiring further attention from ecologists." Emphasizes need for scientifically grounded monitoring strategies to be in community hands so that they can ensure that offtake from wildlife populations is sustainable.

Dzingirai, V. "'CAMPFIRE is not for Ndebele migrants': The Impact of Excluding Outsiders from CAMPFIRE in the Zambezi Valley, Zimbabwe." *Journal of Southern African Studies* 29 (2), 445–459, June 2003.

Notes the common practice of limiting benefits of wildlife to 'producer communities' who share territory with wildlife. This article argues that "the monopoly on benefits held by the producer community serves to antagonise non-members and, in some cases, spurs them on to seek the destruction of what they may come to regard as a costly wildlife management programme."

Fabricius, Christo, Folke, Carl, Cundill, Georgina, and Schultz, Lisen. "Powerless Spectators, Coping Actors, and Adaptive Co-managers: A Synthesis of the Role of Communities in Ecosystem Management." *Ecology and Society* 12 (1), June 2007.

(1-4) "Based on our synthesis, three broad categories of adaptive communities are identified. "Powerless spectator" communities have a low adaptive capacity and weak capacity to govern, do not have financial or technological options, and lack natural

resources, skills, institutions, and networks. "Coping actor" communities have the capacity to adapt, but are not managing social–ecological systems. … "Adaptive manager" communities have both adaptive capacity and governance capacity to sustain and internalize this adaptation."

Fay, Derick A. "Mutual Gains and Distributive Ideologies in South Africa: Theorizing Negotiations between Communities and Protected Areas." *Human Ecology* 35 (1), 81–95, Feb. 2007.

Draws on negotiation theory from psychology and management studies, and applies it to negotiations between state officials, NGOs, and communities. Argues that communities are better served by not assuming a goal of a "win-win" scenario from the outset, but rather do well to take a more advocatory position.

Foote, J.L., Gregor, J.E., Hepi, M.C., Baker, V.E., Houston, D.J., and Midgley, G. "Systemic Problem Structuring Applied to Community Involvement in Water Conservation." *Journal of the Operational Research Society* 58 (5), 645–654, May 2007.

Applies boundary critique, "a theory and set of methodological ideas for exploring the inclusion, exclusion and marginalization of both people and issues," to a long-standing debate over water conservation, and argues that such interventions are helpful for enabling communities and policy makers to find common ground and move toward solutions.

Fraser, Dylan J., Coon, Thomas, Prince, Michael R., Dion, Rene, and Bernatchez, Louis. "Integrating Traditional and Evolutionary Knowledge in Biodiversity Conservation: A Population Level Case Study." *Ecology and Society* 11 (2), article 4, Dec. 2006.

Compares "traditional ecological knowledge (TEK)" with "evolutionary biology knowledge (EBK)." Finds the two supplement each other in important ways: aboriginal TEK provides a much longer temporal window on population dynamics, variation among populations, and human impact on population dynamics. Finds that the insights of TEK are primarily at a smaller scale—individual rivers or areas of a lake—relative to EBK's assessment of populations at large.

Garnett, Stephen T., Sayer, Jeffrey, and du Toit, Johan. "Improving the Effectiveness of Interventions to Balance Conservation and Development: A Conceptual Framework." *Ecology and Society* 12 (1), June 2007.

Compares conservation and development initiatives, particularly in management of the "five capitals": natural, social, human, built, and financial. Includes various community aspects, but emphasizes "conservation and development" fusion rather than community aspect.

Gelcich, Stefan, Edwards-Jones, Gareth, Kaiser, Michel J., and Castilla, Juan C. "Co-management Policy Can Reduce Resilience in Traditionally Managed Marine Ecosystems." *Ecosystems* 9 (6), 951–966, Sept. 2006.

(4) Argues that a turn to co-management policy from a traditional community-based management system which had been demonstrated to be effective undermined both local people's perceptions of conservation and the resilience of the ecosystem. Argues for more complete devolution of environmental decision making and power to the community level.

Githiru, Mwangi, and Lens, Luc. "Application of Fragmentation Research to Conservation Planning for Multiple Stakeholders: An Example from the Taita Hills, Southeast Kenya." *Biological Conservation* 134 (2), 271–278, Jan. 2007.

(2) Offers both a biological study of bird species' response to habitat fragmentation and its implications for biodiversity fragmentation, and an account of incorporating that study and its results into a workshop bringing together scientists, policy makers, and community members. Argues for the importance of utilizing scientific research in discussions around participatory conservation.

Gjertsen, H. "Can Habitat Protection Lead to Improvements in Human Well Being? Evidence from Marine Protected Areas in the Philippines." *World Development* 33 (2), 199–217, Feb. 2005.

Compares data of 40 community-based marine protected areas to evaluate the potential for "win-win" protection of biodiversity and improvement of human conditions through measuring children's nutritional status and coral reef health.

Goldman, M. "Partitioned Nature, Privileged Knowledge: Community-Based Conservation in Tanzania." *Development and Change* 34 (5), 833–862, Nov. 2003.

(1) Surveys community-based conservation in the Tarangire-Manyara ecosystem and finds that "despite the rhetoric of devolution and participation associated with new CBC models, conservation planning in Tanzania remains a top-down endeavour, with communities and their specialized socio-ecological knowledge delegated to the margins."

Grainger, J. "'People are Living in the Park'. Linking Biodiversity Conservation to Community Development in the Middle East Region: A Case Study from the Saint Katherine Protectorate, Southern Sinai." *Journal of Arid Environments* 54 (1), 29–38, May 2003.

(2) Recounts development of community-based conservation, development, and ecotourism initiatives in a protectorate with both natural and culturally significant

sites that is also home to seven thousand Bedouin from six tribes. Notes use of community guards enforcing an ethic of both cultural and natural conservation.

Granek, E.F., and Brown, M.A. "Co-management Approach to Marine Conservation in Moheli, Comoros Islands." *Conservation Biology* 19 (6), 1724–1732, Dec. 2005.

(4) Analysis of co-management project after three years with 80 percent community control. Finds that successes included empowered communities and high participation, with traditional knowledge able to fill gaps in science. However, also notes "co-management is not immune to social issues, inadequate government law enforcement, or political instability and is an incomplete substitute for sound science."

Gray, Thomas N.E., Chamnan, Hong, Borey, Ro, Collar, Nigel J., and Dolman, Paul M. "Habitat Preferences of a Globally Threatened Bustard Provide Support for Community-Based Conservation in Cambodia." *Biological Conservation* 138 (3-4), 341–350, Sept. 2007.

(3) Biological survey of endangered species, which finds it to be flourishing in agricultural areas under community management. "By demonstrating weak effects of human disturbance, and the importance of annual burning by local communities, our findings support community-based grassland management in which local traditional activities are encouraged to persist alongside *bengal florican*." Impetus for project is from outside, but is based on community's "traditional" practices.

Hjortso, Carsten Nico, Straede, Steffen, Helles, Finn. "Applying Multi-criteria Decision-making to Protected Areas and Buffer Zone Management: A Case Study in Royal Chitwan National Park, Nepal." *Journal of Forest Economics* 12 (2), 91–108, Spring 2006.

Finds that community-based forest management enables sustainable harvesting of fuelwood in buffer zones around park, but is insufficient for livestock fodder needs. Suggests that additional outside input along the lines of improved seeds, etc., is required to meet fodder needs and ensure sustainability of buffer zones.

Hockley, N.J., Jones, J.P.G., Andriahajaina, F.B., Manica, A., Ranambitsoa, E.H., and Randriamboahary, J.A. "When Should Communities and Conservationists Monitor Exploited Resources?" *Biodiversity and Conservation* 14 (11), 2795–2806, Oct. 2005.

Evaluates factors leading to the amount of effort and resources that communities and conservationists are willing to expend on monitoring, and under what circumstances. Determines that conventional monitoring efforts are likely to be beyond the scope of what either group is truly willing to expend on them, suggesting

importance of realistic goals and development of low-cost monitoring strategies and/or "negotiated moratoria" on harvesting in questionable circumstances.

Holmern, T., Roskaft, E., Mbaruka, J., Mkama, S.Y., and Muya, J. "Uneconomical Game Cropping in a Community-Based Conservation Project Outside the Serengeti National Park, Tanzania." *Oryx* 36 (4), 364–372, Oct. 2002.

(2) Compares game cropping program designed to provide incentives not to hunt for communities near Serengeti National Park with the impact of illegal hunting. Finds that the cropping program is both economically unsustainable and contributes too little to discourage illegal hunting, which continues to provide more protein to the local diet. Thus, suggests ceasing program and emphasizing diversification of local economy.

Jagger, P., Pender, J., and Gebremedhin, B. "Trading off Environmental Sustainability for Empowerment and Income: Woodlot Devolution in Northern Ethiopia." *World Development* 33 (9), 1491–1510, Sept. 2005.

(2-4) Compares scales of woodlot management and finds greater empowerment and efficiency as management is devolved to the community level, but notes that "environmental sustainability was associated with less devolved woodlot management."

Johannes, R.E. "The Renaissance of Community-Based Marine Resource Management in Oceania." *Annual Review of Ecology and Systematics* 2002 (33), 317–340.

(3) Discusses community-based marine resource management of an age-old practice, previously under decline due to westernization, but notes importance of the fact that it is now practiced with advice from NGOs, making it a form of co-management.

Johannesen, Anne Borge. "Protected Areas, Wildlife Conservation, and Local Welfare." *Ecological Economics* 62 (1), 126–135, April 2007.

Offers "a bio-economic analysis of protected area expansion," arguing that expansion of protected areas may reduce both the welfare of local people and degree of wildlife conservation.

Jones, C.B., and Horwich, R.H. "Constructive Criticism of Community-Based Conservation." *Conservation Biology* 19 (4), 990–991, Aug. 2005.

Article reflects on conservation experiences at the "Community Baboon Sanctuary…a community-based ecotourism project in Belize formed in 1985" and recounts various obstacles.

Jones, J.L. "Transboundary Conservation: Development Implications for Communities in KwaZulu-Natal, South Africa." *International Journal of Sustainable Development and World Ecology* 12 (3), 266–278, Sept. 2005.

"This paper seeks to provide an empirical case study of a South African community bordering the Lubombo TFCA [trans-frontier conservation area] (South Africa, Swaziland, Mozambique). Results are presented that indicate the Mbangweni community in KwaZulu-Natal could experience decreased access to social, natural, and economic resources as a result of the Peace Park."

Jones, Samantha. "Tigers, Trees and Tharu: An Analysis of Community Forestry in the Buffer Zone of the Royal Chitwan National Park, Nepal." *Geoforum* 38 (3), 558–575, May 2007.

Argues that "National policy creates sufficient but not necessary conditions for achieving downward accountability, transparency and fairness" in community forestry. Emphasizes importance of community ownership of the forests in question, but also the need for controls to address inequities within the community, especially in relation to caste privilege.

Khumbongmayum, A.D., Khan, M.L., and Tripathi, R.S. "Sacred Groves of Manipur, Northeast India: Biodiversity Value, Status and Strategies for Their Conservation." *Biodiversity and Conservation* 14 (7), 1541–1582, June 2005.

(Finds 5, argues 2 or 3) Combines community interviews with scientific assessment of biodiversity in sacred groves that have been preserved for generations in accordance with traditional taboos. Found 173 plant species representing 145 genera under 70 families, of which 96 percent of species have some medicinal use. However, also found that traditional taboos are eroding, raising the need for intentional conservation if the biodiversity of the groves is to be preserved, while noting that such a step must take into account economic improvements for the communities in order to be successful.

Kideghesho, Jafari R., Roskaft, Eivin, and Kaltenborn, Bjorn P. "Factors Influencing Conservation Attitudes of Local People in Western Serengeti, Tanzania." *Biodiversity and Conservation* 16 (7), 2213–2230, June 2007.

Attitudinal survey to determine statistical factors in community perception of Serengeti National Park. Breaks factors down by percentages—i.e., suggests that education accounts for 51 percent of the variation in people's perception of the park, etc.

Kijtewachakul, N., Shivakoti, G.P., and Webb, E.L. "Forest Health, Collective Behaviors, and Management." *Environmental Management* 33 (5), 620–636, May 2004.

Compares tree species and density in a community-managed forest and state-driven 'conservation' forest. Finds greater density of species preferred by the community, especially those producing high yields of useful fuel and timbers. Overall, however, height and forest succession were found to be comparable, and notes that community-based management "can lead to natural regeneration and biodiversity similar to 'conservation' forests."

King, Brian H. "Conservation and Community in the New South Africa: A Case Study of the Mahushe Shongwe Game Reserve." *Geoforum* 38 (1), 207–219, Jan. 2007.

(2) Survey emphasizing variation in community perceptions of game reserve depending on socio-economic status. Notes in particular that young people are less likely to be engaged with the tribal association that participates as the community voice in the reserve's management, thus emphasizing the need for holistic engagement with the community.

Klein, Jorgen, Reau, Bertrand, Kalland, Ingvild, and Edwards, Mary. "Conservation, Development, and a Heterogeneous Community: The Case of Ambohitantely Special Reserve, Madagascar." *Society & Natural Resources* 20 (5), 451–467, May-June 2007.

Finds that "in theory the integrated conservation and development discourse provides a people-oriented context for framing conservation strategies, but in practice it may be no more effective than the 'fortress'-style approach that it replaced" if "politically correct" are inappropriate to the specifics of the local context.

Kull, C.A. "Empowering Pyromaniacs in Madagascar: Ideology and Legitimacy in Community-Based Natural Resource Management." *Development and Change* 33 (1), 57–78, Jan. 2002.

(3) Presenting evaluation of community-based natural resource management in Madagascar, argues that success is dependent on real empowerment of local communities. Identifies two key factors, "obstructive environmental ideologies ('received wisdoms') and the complex political and social arena of 'community' governance," which often undermine empowerment.

Lawrence, Anna, Paudel, Krishna, Barnes, Richard, and Malla, Yam. "Adaptive Value of Participatory Biodiversity Monitoring in Community Forestry." *Environmental Conservation* 33 (4), 325–334, Dec. 2006.

Proposes a conceptual framework for community monitoring bringing together "diversity (genes, species, habitats and processes), types of values (direct use, indirect use, option and existence) and stakeholders." Argues that "participatory monitoring is more conceptually challenging than is usually recognized" given that villagers' perception of quality forest does not necessarily equate with biodiversity, but that a complex enough conceptual framework will enable monitoring that takes into account equity and cultural contexts.

Lepp, A., and Holland, S. "A Comparison of Attitudes Toward State-led Conservation and Community-based Conservation in the Village of Bigodi, Uganda." *Society & Natural Resources* 19 (7), 609–623, Aug. 2006.

Based on in-depth interviews, compares people's attitudes to a community-based conservation project versus a state-led project. Finds significantly greater support for community-based approach.

Loibooki, M., Hofer, H., Campbell, K.L.I., and East, M.L. "Bushmeat Hunting by Communities Adjacent to the Serengeti National Park, Tanzania: The Importance of Livestock Ownership and Alternative Sources of Protein and Income." *Environmental Conservation* 29 (3), 391–398, Sept. 2002.

Presents results of surveys of those arrested for illegal bush-meat hunting. Argues illegal bush-meat hunting is not appreciably impacted by community-based wildlife conservation programs in place.

Lu, Yihe, Fu, Bojie, Chen, Liding, Xu, and Fianying, Qi Xin. "The Effectiveness of Incentives in Protected Area Management: An Empirical Analysis." *International Journal of Sustainable Development and World Ecology.* 13 (5), 409–417, Oct. 2006

(2) Demonstrates that "government-paid community-based conservation projects provided the most widespread and direct economic incentives," with the industries of hydropower, hotels, and tourism significantly raising local employment levels. However, points out that lucrative incentives often lead to in-migration, putting added stress on local ecosystems and economies.

Mahanty, S. "Conservation and Development Interventions as Networks: The Case of the India Ecodevelopment Project, Karnataka." *World Development* 30 (8), 1369–1386, Aug. 2002.

Notes the difficulties in institutionalizing socially and environmentally sustainable community-based conservation projects when principles are applied on the ground. Using actor network theory, argues that donors and practitioners should focus on network building as a key aspect of the intervention.

Mallory, Mark L., Fontaine, Alain J., Akearok, Jason A., and Johnston, Victoria H. "Synergy of Local Ecological Knowledge, Community Involvement and Scientific Study to Develop Marine Wildlife Areas in Eastern Arctic Canada." *Polar Record* 42 (222), 205–216, July 2006.

(3) Traces process of creating reserves of marine bird habitat in the arctic. Suggests importance of utilizing local indigenous knowledge both for its importance in itself and as a means for fostering partnership and overcoming local communities' distrust of government.

Manan, A., and Ibrahim, M. "Community-Based River Management in Southeast Sulawesi, Indonesia: A Case Study of the Bau-Bau River." *Water Science and Technology* 48 (7), 181–190, 2003.

(2) Presents the condition of the Bau-Bau River, threats based on increasing development, and capacity for a community-based management plan being developed by the government.

Marschke, M., and Nong, K. "Adaptive Co-management: Lessons from Coastal Cambodia." *Canadian Journal of Development Studies-Revue Canadienne d Etudes du Developpement* 24 (3), 369–383, 2003.

Based on several case studies, suggests that "community-based management requires support from the provincial and national level; facilitation between stakeholders is important; and experimentation is an essential component of management." Argues that effective community programs display "adaptive co-management" given importance of trial and error and "learning by doing."

Martin, K., and James, M.C. "Conserving Sea Turtles in Canada: Successful Community-Based Collaboration between Fishers and Scientists." *Chelonian Conservation and Biology* 4 (4), 899–907, April 2005.

(3) Chronicles a collaboration between scientists and fishermen, in which fishermen were recruited to monitor populations of leatherneck turtles, translating traditional knowledge of fishers and their observations at sea into data for conservation.

Mbaiwa, J.E. "Wildlife Resource Utilisation at Moremi Game Reserve and Khwai Community Area in the Okavango Delta, Botswana." *Journal of Environmental Management* 77 (2), 144–156, Oct. 2005.

(1–2) Traces history of the Moremi Game Reserve and displacement of Khwai people at its founding in 1963, and their subsequent exclusion from tourism in the area, and juxtaposes these with recent (2000) efforts at community-based conservation in the area. Finds that community-based conservation has led to significantly improved perception of conservation and tourism by the Khwai community and reduced conflict with wildlife.

McCallum, Wayne, Hughey, Kenneth F.D., and Rixecker, Stefanie S. "Community Environmental Management in New Zealand: Exploring the Realities in the Metaphor." *Society & Natural Resources* 20 (4), 323–336, April 2007.

Provides qualitative analysis of six case studies to evaluate the contributions of community-based conservation approaches to environmental sustainability. Finds that the realities of such cases are more complex than suggested by normative descriptions, "with matters such as social collectivity, interpretations of nature, and ideas about biophysical change being more variable than commonly portrayed."

Mersey, J.E., Millward, A.A., and Martinez, L.M. "Realizing the Potential of GIS in Community-Based Management of Protected Areas." *International Journal of Sustainable Development and World Ecology.* 9 (3), 208–222, Sept. 2002.

Discusses role that GIS can play in land management, and especially biosphere reserves. Argues that community participation becomes especially important as GIS moves from being simply a representation of spatial data to a synthesizing and problem-solving tool.

Menzies, Nicholas K. *Our Forest, Your Ecosystem, Their Timber: Communities, Conservation, and the State in Community-Based Forest Management.* New York: Columbia University Press, 2007.

Drawing on case studies from China, Zanzibar, Brazil, and India, published literature and the author's field experience, positions community-based forest management within the larger dynamics and debates over natural resources management.

Mgumia, F.H., and Oba, G. "Potential Role of Sacred Groves in Biodiversity Conservation in Tanzania." *Environmental Conservation* 30 (3), 259–265, Sept. 2003.

Presents scientific evaluation of forest health in sacred groves, suggesting they contribute to biodiversity conservation and should be designated protected areas and incorporated into modern conservation schemes.

Montagnini, Florencia, and Jordan, Carl F. *Tropical Forest Ecology: The Basis for Conservation and Management.* New York: Springer, 2005.

Presents an overview of conservation predicaments facing tropical forests, bringing together discussion of both forest ecology and conservation methods. Emphasizes need for innovation in fusing community-benefit and conservation goals, and need for solid understanding of forest ecology in fostering successful community-based forestry projects.

Myers, G.A. "Local Communities and the New Environmental Planning: A Case Study from Zanzibar." *Area* 34 (2), 149–159, June 2002.

Using political ecology research, article examines enabling conditions for successful community-based conservation and natural resources management. Emphasizes importance of understanding social and political issues at a local scale.

Mugisha, A.R., and Jacobson, S.K. "Threat Reduction Assessment of Conventional and Community-Based Conservation Approaches to Managing Protected Areas in Uganda. *Environmental Conservation* 31 (3), 233–241, Sept. 2004.

Compares community-based and conventional protected areas in terms of their ability to mitigate "threats" to the integrity and effectiveness of the preserve, such as poaching, logging, encroachment, brush burning, etc. Finds little difference between conventional and community-based approaches, which mitigated a mean = 49.0 ± 12 percent (community-based) and mean = 37.96 ± 21.6 percent (conventional), respectively. Does note that community-based approaches were more effective in mitigating logging, bush burning, encroachment, and unclear boundaries, but that both approaches mitigated less than 50 percent of identified threats.

Mukadasi, Buyinza, and Nabalegwa, Muhammod. "Gender Mainstreaming and Community Participation in Plant Resource Conservation in Buzaya County, Kamuli District, Uganda." *African Journal of Ecology* 45 (Sup. 1), 7–12, March 2007.

Emphasizes need to find strategies to engage women in community forest projects, rather than simply addressing "community" as a single unit. In particular discusses importance of using local language given women's low education levels.

Munthali, Simon M. "Transfrontier Conservation Areas: Integrating Biodiversity and Poverty Alleviation in Southern Africa." *Natural Resources Forum* 31 (1), 51–60, Feb. 2007.

(2) Argues that "trans-frontier conservation areas" are superior to "trans-frontier parks" in achieving conservation goals. The latter are state controlled and managed. The latter promote multi-use agendas involving local communities. For example, "local communities can secure legal rights to their customary land being devoted to biodiversity conservation and use such pieces of land as collateral in negotiating partnerships with the private sector in developing conservation-based enterprises."

Mutandwa, Edward, and Gadzirayi, Christopher Tafara. "Impact of Community-Based Approaches to Wildlife Management: Case Study of the CAMPFIRE Programme in Zimbabwe." *International Journal of Sustainable Development and World Ecology* 14 (4), 336–345, Aug. 2007.

(2*) Survey of community perceptions of CAMPFIRE. "The results of the study revealed that, although the CAMPFIRE concept has been instrumental in creation of employment and infrastructure, the local community considers that no significant changes have occurred to their livelihoods. The findings suggest that the current model of wildlife conservation in Zimbabwe is not promoting total community participation." (*Finds 2, advocates 4.)

Nagendra, H., Karmacharya, M., and Karna, B. "Evaluating Forest Management in Nepal: Views across Space and Time." *Ecology and Society* 10 (1), Article no. 24, June 2005.

A study comparing a community-forest project in a buffer zone of Royal Chitwan National Park (thus better funded but more regulated) with a similar project not attached to the park (more community control, but a poorer community with less outside support). Combines surveys of 23 user groups with "multidate Landsat TM (R) image classification to develop a land-cover change classification, and use this to generate objective, quantitative, biophysical indicators" on the state of the land. These are supplemented by in-depth field interviews. Notes that often delegation of responsibility is not matched by delegation of property rights and power, which hinders community capacity.

Nielsen, M.R. "Importance, Cause and Effect of Bushmeat Hunting in the Udzungwa Mountains, Tanzania: Implications for Community Based Wildlife Management." *Biological Conservation* 128 (4), 509–516, April 2006.

Evaluates potential for community-based wildlife management to counter bushmeat hunting. Finds that in this particular area the relevant species are too depleted for sustainable yields. However, hunters were found to be the poorest and most protein deficient of local people, suggesting conservation efforts should focus on increased access to domestic animals among the poorest population and prevention of hunting.

Norgrove, Linda, and Hulme, David. "Confronting Conservation at Mount Elgon, Uganda." *Development and Change* 37 (5), 1093–1116, Sept. 2006.

(1/5) Argues that the touted turn toward "community-based conservation" has done little to change dynamics between local people and actual parks. Suggests that "relationships between parks and people are best understood as struggles in which 'park neighbours' use covert and overt 'weapons of the weak' to challenge the hegemony of conservation." Provides an analysis of those strategies of resistance.

Pagdee, A., Kim, Y.S., and Daugherty, P.J. "What Makes Community Forest Management Successful: A Meta-study from Community Forests throughout the World." *Society & Natural Resources* 19 (1), 33–52, Jan. 2006.

Reviews 31 articles (covering 69 case studies) on community forestry from around the world for systematic data testing. Identifies 43 independent variables from internal community dynamics, to resources, to external factors, the most significant of these being "tenure security, clear ownership, congruence between biophysical and socioeconomic boundaries of the resources, effective enforcement of rules and regulations, monitoring, sanctioning, strong leadership with capable local organization, expectation of benefits, common interests among community members, and local authority."

Poonswad, P., Sukkasem, C., Phataramata, S., Hayeemuida, S., Plongmai, K., Chuailua, P., Thiensongrusame, P., and Jirawatkavi, N. "Comparison of Cavity Modification and Community Involvement as Strategies for Hornbill Conservation in Thailand." *Biological Conservation* 122 (3), 385–393, April 2005.

Presents results of hornbill breeding study demonstrating importance of involvement of local communities in eradicating poaching and mitigating disturbance of possible nesting sites.

Raik, Daniela B., and Decker, Daniel J. "A Multisector Framework for Assessing Community-Based Forest Management: Lessons from Madagascar." *Ecology and Society* 12 (1), June 2007.

Offers an analytical framework consisting of "People, Nature, Wealth, and Power" categories as a lens for assessing community-based forest management. This is a modification of "Nature, Wealth, Power" framework often used in assessing natural resource issues in Africa. As suggested by added "People" category, this provides a means for pointing out the divergent interests of community/local people from outside groups as well as differentiating interests within the community.

Reed, Maureen G. "Uneven Environmental Management: A Canadian Comparative Political Ecology." *Environment and Planning* 39 (2), 320–338, Feb. 2007.

Develops a conceptual framework to identify key elements of "regional environmental-management regimes," and uses it to compare two Canadian biosphere reserves: Clayoquot Sound, British Columbia, and Redberry Lake, Saskatchewan. Argues that uneven management resulting from dependence on community capacity may reinforce social inequalities between regions.

Resurreccion, Bernadette P. "Rules, Roles and Rights: Gender, Participation and Community Fisheries Management in Cambodia's Tonle Sap Region." *International Journal of Water Resources Development* 22 (3), 433–447, Sept. 2006.

Examines community fisheries recently constituted by the Cambodian government. Finds that attempts to bring women into the program only through addressing poverty and conservation goals is likely to inadvertently perpetuate existing gender hierarchies.

Robertson, J., and Lawes, M.J. "User Perceptions of Conservation and Participatory Management of iGxalingenwa Forest, South Africa." *Environmental Conservation* 32 (1), 64–75, March 2005.

"A questionnaire survey of 60 households (43%) revealed the attitudes of users toward current management and conservation options for iGxalingenwa forest. Users chose participatory forest management (52%) over community (25%) or state-dominated forest management (2%) structures. User choice was motivated by the desire to secure rights of access to, and ensure equitable benefit from, a dwindling resource base, rather than the conservation of these resources to sustain future yields."

Rockwell, Cara A., Kainer, Karen A., Staudhammer, Christina L., and Baraloto, Christopher. "Future Crop Tree Damage in a Certified Community Forest in Southwestern Amazonia." *Forest Ecology and Management* 242 (2-3) 108–118, April 30, 2007.

Conducts a study to determine the extent of damage to future crop trees (FCTs) and explores options for lower impact harvesting. Determines that 15 percent of FCTs are damaged under current practice. Also notes importance of future study of the impact of logging extraction on nontimber forest products, especially in areas such as the Amazon where many community-based projects attempt to integrate various forest uses.

Roe, Dilys, Jones, Brian, Bond, Ivan, and Bhatt, Seema. *Legal Action, Global Aspirations: The Role of Community Conservation in Achieving International Goals for Environment and Development.* Natural Resource Issues Series No. 4. London: Intl. Inst. for Environment and Development, 2006.

Report providing overview of community-based conservation as a means toward achieving Millennium Development Goals and Millennium Ecosystem Assessment.

Romanach, Stephanie S., Lindsey, Peter A., and Woodroffe, Rosie. "Determinants of Attitudes Towards Predators in Central Kenya and Suggestions for Increasing Tolerance in Livestock Dominated Landscapes." *Oryx* 41 (2), 185–195, April 2007.

Survey developing an "index of tolerance" for how much livestock community members are willing to lose before killing the predators. Suggests that tolerance increases with prospect of ecotourism or trophy hunting income, and with land ownership.

Rowat, David, and Engelhardt, Udo. "Seychelles: A Case Study of Community Involvement in the Development of Whale Shark Ecotourism and its Socio economic Impact." *Fisheries Research* 84 (1), 109–113, March 2007.

(2) "The stakeholder driven process involving dive and boat operators, conservation organizations and governmental agencies that instigated a nationwide monitoring network is described and the feedback to the public and stakeholders is illustrated. The development and adoption of a code of conduct for whale shark encounters to enable the sustainable use of whale sharks as an ecotourism resource is described."

Russell, Diane, and Harshbarger, Camilla. *GroundWork for Community-Based Conservation: Strategies for Social Research.* Landham MD: AltaMira Press, 2003.

Provides introduction to importance of social science research in community-based conservation, and methodologies from ethnography and interviews to surveys and community mapping.

Salam, M.A., Noguchi, T., and Pothitan, R. "Community Forest Management in Thailand: Current Situation and Dynamics in the Context of Sustainable Development." *New Forests* 31 (2), 273–291, March 2006.

(5) Provides a survey of potential for community forest management in Thailand. Argues that, on the one hand, local people have been practicing sustainable forest management for generations along traditional lines, but that Thailand provides no legal recognition of community forest management, which prevents institutionalization and transfer of appropriate technology to the community level.

Salick, Jan, Amend, Anthony, Anderson, Danica, Hoffmeister, Kurt, Gunn, Bee, and Fang, Zhendong. "Tibetan Sacred Sites Conserve Old Growth Trees and Cover in the Eastern Himalayas." *Biodiversity and Conservation* 16 (3), 693–706, March 2007.

(5) Biological survey of area near Khawa Karpo, a sacred mountain in Tibet. A follow-up to a remote sensing study. Finds that "Understory richness, diversity, cover, and number of useful species are measured; for trees, richness, diversity, cover, and density are measured. Results indicate that within habitats sanctity does not affect understory plant communities; however, within sacred areas trees are larger ($p = 0.003$) and forests have greater cover ($p = 0.003$) than nonsacred areas. Our results indicate that, whereas placement of sacred areas and preservation of vegetation cover affects useful plants, biodiversity and endemism, within habitats sacred sites preserve old growth trees and forest structure."

Sayer, Jeffrey, and Campell, Bruce. *The Science of Sustainable Development: Local Livelihoods and the Global Environment.* Cambridge: Cambridge University Press, 2003.

Drawing on case studies from around the world, argues for the need for disciplinary integration into a new science, which the authors compare to Aldo Leopold's call for an "integrated science of landscape management," in order to integrate development and conservation goals.

Schafer, J., and Bell, R. "The State and Community-Based Natural Resource Management: The Case of the Moribane Forest Reserve, Mozambique." *Journal of Southern African Studies* 28 (2), 401–420, June 2002.

(1) Examines community-based natural resource management, and argues that despite the rhetoric and stated goals of devolution, such programs often allow the state to extend its reach and control in rural areas.

Scholte, P., De Groot, W.T., and Mayna, Z. Talla. "Protected Area Managers' Perceptions of Community Conservation Training in West and Central Africa." *Environmental Conservation* 32 (4), 349–355, Dec. 2005.

Reviews trainees' evaluations of diploma and certificate programs in community conservation at Garoua Regional Wildlife College for Francophone Africa.

Selvam, V., Ravichandran, K.K., Gnanappazham, L., and Navamuniyammal, M. "Assessment of Community-based Restoration of Pichavaram Mangrove Wetland using Remote Sensing Data." *Current Science* 85 (6), 794–798, Sept. 25 2003.

Using "TM digital data of 1986 (before restoration) and LISS III digital data of 2002 (after restoration)" study finds a 90 percent increase in mangrove forest cover. Attributes success to a "science-based, community-centred and process-oriented approach followed for the restoration of the Pichavaram mangrove wetland in collaboration with the Forest Department, Government of Tamil Nadu and participation of local mangrove user-communities." Further argues for importance of remote-sensing data in evaluating conservation and restoration efforts.

Sesabo, Jennifer K. *Marine Resource Conservation and Poverty Reduction Strategies in Tanzania.* New York: Springer, 2007.

Combining econometric and Stochastic Production Frontier techniques, compares two case studies evaluating the impact of socio-economic variables in coastal households on perception of and participation in conservation initiatives.

Sheikh, Kashif M. "Involving Religious Leaders in Conservation Education in the Western Karakorum, Pakistan." *Mountain Research and Development* 26 (4), 319–322, Nov. 2006.

(3) Demonstrates effectiveness of engaging religious leaders in cultivating community support for conservation. Important because religious institutions are the strongest in the region and viewed as moral voice. Religious leaders' involvement is also found to be helpful in addressing volatile issues such as expanded tourism and its cultural impacts.

Sikor, T. "Analyzing Community-Based Forestry: Local, Political and Agrarian Perspectives." *Forest Policy and Economics* 8 (4), 339–349, June 2006.

Introductory article to special issue on community forestry. Provides overview of important themes, ideas, and questions confronting the field.

Silori, C.S., Mehar, M., Khalid, M.A., and Paul, V. "Non-timber Forest Products: Conservation Status and Management Priorities in the Community Managed Forests of Andhra Pradesh, South India." *International Journal of Sustainable Development and World Ecology* 12 (3), 334–346, Sept. 2005.

Presents the results of surveys of respondents in 20 villages and surveys of nontimber forest products in 20 community forests.

Spaling, H. "Innovation in Environmental Assessment of Community-Based Projects in Sub-Saharan Africa." *Canadian Geographer-Geographe Canadien* 47 (2), 151–168, Summer 2003.

Presents effectiveness of innovations in application of environmental assessment (EA) to community-based conservation projects in five case studies. Innovations discussed include "the dovetailing of environmental constructs in neopopulism with a conceptual shift in EA toward participatory, transactive planning; (2) assessment methodologies adapted from participatory rural appraisal; (3) development of grassroots EA capacity; and (4) linkage of community EA with project planning."

Spiteri, A., and Nepal, S.K. "Incentive-Based Conservation Programs in Developing Countries: A review of Some Key Issues and Suggestions for Improvements." *Environmental Management* 37 (1), 1–14, Jan. 2006.

(2) Notes that incentive based programs' results often fall short of their rhetoric, partly because "benefits vary greatly at different 'community' scales and that a holistic conceptualization of a community is essential to incorporate the complexities of a heterogeneous community when designing and implementing the IBPs." Goes on to suggest particular attention to "accurate identification of 'target' beneficiaries, greater inclusion of marginal communities, and efforts to enhance community aptitudes."

Stearman, A.M. "One Step Forward, Two Steps Back: The Siriono and Yuqui Community Forestry Projects in the Bolivian Amazon." *Human Organization* 65 (2), 156–166, Summer 2006.

(2/3) Compares and contrasts two community forestry programs. Argues for the importance of attention to small scale, and in particular of detailed knowledge of local context on the part of project's initiators and staff.

Stone, M., and Wall, G. "Ecotourism and Community Development: Case Studies from Hainan, China." *Environmental Management* 33 (1), 12–24, Jan. 2004.

(2) Evaluates condition of ecotourism as source of community revenue in two communities near protected areas. Finds that ecotourism initiatives are at an early stage in both sites and have yet to offer significant revenue, either toward the communities' socioeconomic status or toward funding conservation, but that community members are hopeful and feel positively about conservation initiatives.

Sunderlin, W.D. "Poverty Alleviation through Community Forestry in Cambodia, Laos, and Vietnam: An Assessment of the Potential." *Forest Policy and Economics* 8 (4), 386–396, June 2006.

Finds that although poverty alleviation is a stated goal in community forestry projects, other criteria ranging from donor stipulations to elites' protecting of their forest rents to illicit harvesting by those in power are more likely to guide actual decisions. Recommends three primary areas to be addressed: "(1) control illegal logging and forest sector corruption; (2) locate community forestry sites where there are abundant forests; and (3) boost forest income through improved access rights, tenure, and benefit sharing, and removal of anti-poor regulations."

Susilowati, I., and Budiati, L. "An Introduction of Co-management Approach into Babon River Management in Semarang, Central Java, Indonesia." *Water Science and Technology* 48 (7), 173–180, 2003.

Using descriptive statistics and institutional analysis, study attempts to determine effects of co-management, and strategies for further empowerment of stakeholders. Notes that community participation is inconsistent among different regions of the river, and notes five factors affecting community participation: "intensity of resource commercialisation; formal education of the community; and dependency of the community toward the resources, resource products distribution and resource damage."

Tai, Hsing-Sheng. "Development Through Conservation: An Institutional Analysis of Indigenous Community-Based Conservation in Taiwan." *World Development* 35 (7), 1186–1203, July 2007.

Compares conservation and development models according to emphasis on "development through conservation" or "conservation through development" and finds that, for greater integration to occur, "priority should be given to conservation rather than development efforts, especially when internal institutions are still weak." Interested in role of those outside the community in establishing institutions—the actual programs in question have greater degrees of community participation.

Taylor, P.L. "A Fair Trade Approach to Community Forest Certification? A Framework for Discussion." *Journal of Rural Studies* 21 (4), 433–447, Oct. 2005.

Offers a comparative commodity chain analysis between coffee and wood products to explore the potential for a Fair Trade approach to community forest certification. Determines that while obstacles include "the structure of conventional wood products commodity chains, common wood product characteristics, certification's current commitment to conventional market logics and practices, and informal governance influences favoring powerful economic actors" there are features of forest certification which would support Fair Trade.

Taylor, P.L. "Reorganization or Division? New Strategies of Community Forestry in Durango, Mexico." *Society & Natural Resources* 16 (7), 643–661, Aug. 2003.

Examines impact of recent agrarian reforms in Mexico on viability of community forestry projects, questioning whether these represent reorganization in pursuit of community objectives or division in pursuit of individual agendas at the expense of social and environmental sustainability. Finds that the "counterintuitive experiences of these cases suggest local responses to restructuring may promote viable communities of producers with stakes in sustainable management or bypass such stakeholder communities."

Taylor-Ide, Daniel C., and Taylor, Carl E. *Just and Lasting Change: When Communities Own the Future.* Baltimore: Johns Hopkins University Press, 2002.

Presents a series of case studies of community-based development and conservation, followed by a series of chapters in handbook format outlining a process for initiating effective community-based social change. Model is based on partnership between top-down, bottom-up, and outside-in and an iterative process of seven tasks which must be completed in each iteration of the process.

Thakadu, O.T. "Success Factors in Community Based Natural Resources Management in Northern Botswana: Lessons from Practice." *Natural Resources Forum* 29 (3), 199–212, Aug. 2005.

(3) Based on primary data, article advocates "moving away from a conventional consultative forum, to a more multi-faceted approach that will facilitate capturing the views of diverse user groups within the community," and emphasizes importance of studying "socio-economic, political and cultural characteristics inherent in communities to guide programme implementation."

Thang, Nguyen Ngoc, Rossier, Patrick, Schaltenbrand, Hans, and Sieber, Patrick. "Safeguarding Multifunctional Forest Ecosystems in Viet Nam: Introducing Village-level Community Forest Management (CFM)." *Mountain Research and Development* 27 (3), 196–201, Aug. 2007.

(2) Advocates benefits of community-based forest management in "satisfying rural people's forest resource needs, and ensuring long-term conservation of unique multifunctional forest ecosystems." Project in question is a collaboration between the Vietnamese government and SDC, the Swiss Agency for Development and Cooperation, and the Swiss NGO Helvetas in fostering community-managed forestry.

Tompkins, E.L., and Adger, W.N. "Does Adaptive Management of Natural Resources Enhance Resilience to Climate Change?" *Ecology and Society* 9 (2), Article no. 10, Dec. 2004.

Emphasizes the importance of adaptive capacity in conditions where global climate change is likely to force communities to adapt to conditions beyond any previous experience. Further demonstrates that community-based collective management is both more adaptive in the present moment, and fosters increased adaptive capacity, through a case study of community-based coastal management in Trinidad and Tobago.

Topp-Jorgensen, E., Poulsen, M.K., Lund, J.F., and Massao, J.F. "Community-Based Monitoring of Natural Resource Use and Forest Quality in Montane Forests and Miombo Woodlands of Tanzania." *Biodiversity and Conservation* (14) 11, 2653–2677, Oct. 2005.

Presents a community-based monitoring system, which focuses on extraction and levels of forest disturbance rather than biodiversity per se. Notes that the most important aspects are "simplicity, incentive mechanisms, transparency and accountability, and autonomy for local managers." Also argues, however, that in sensitive areas local monitoring is not sufficient to replace conventional scientific monitoring of biodiversity.

Tran, K.C. "Public Perception of Development Issues: Public Awareness Can Contribute to Sustainable Development of a Small Island." *Ocean & Coastal Management* 49 (5-6), 367–383, 2006.

(2) Describes four-year process of including local community in long-term monitoring of coastal pollution, pointing to the ways in which increasing community knowledge and awareness build capacity for further participation in conservation and development initiatives.

Tucker, C.M. "Community Institutions and Forest Management in Mexico's Monarch Butterfly Reserve." *Society & Natural Resources* 17 (7), 569–587, Aug. 2004.

(4) Presents a comparative analysis of two community forests in Mexico's Monarch Butterfly Reserve, where the majority of land is community owned. Finds that conservation effectiveness is compromised by "lack of coordination between state and community institutions, and tensions among residents and external authorities," and emphasizes the importance of strengthening community institutions.

Usongo, L., and Nkanje, B.T. "Participatory Approaches towards Forest Conservation: The Case of Lobeke National Park, South East Cameroon." *International Journal of Sustainable Development and World Ecology* 11 (2), 119–127, June 2004.

(2) Presents an experimental process of community involvement in the Lobeke National Park, including designating five community hunting zones where community members could selectively hunt to supplement protein needs, and lease out sport hunting rights, supporting local development initiatives.

van Eeden, D. G., van Rensburg, B. J., De Wijn, M., and Bothma, J. du P. "The Value of Community-based Conservation in a Heterogeneous Landscape: An Avian Case Study from Sand Forest in Maputaland, South Africa." *South African Journal of Wildlife Research* 36 (2), 153–157, Oct. 2006.

(5) Compares forest bird assemblages between Tembe Elephant Park and land set aside for conservation by a local community adjacent to the park. Finds greater biodiversity in the community's conservation plot than in the park itself.

Vasseur, L., and Hart, W. "A Basic Theoretical Framework for Community-Based Conservation Management in China and Vietnam." *International Journal of Sustainable Development and World Ecology* 9 (1), 41–47, March 2002.

Introduces a theoretical framework for understanding community-based conservation projects. Emphasizes importance of definition of terms, to integrate

public education into conservation programs, and to find means of working across divergent political systems in meeting conservation goals.

Velasquez, Jerry, Yashiro, Makiko, Yoshimura, Susan, and Ono, Izumi. *Innovative Communities: People-centered Approaches to Environmental Management in the Asia Pacific Region.* New York: United Nations University Press, 2006.

Brings together experts, academics, and community leaders from an array of disciplines and backgrounds to explore the importance of innovation and dynamic change in community resource management and conservation.

Virtanen, P. "Local Management of Global Values: Community-Based Wildlife Management in Zimbabwe and Zambia." *Society & Natural Resources* 16 (3), 179–190, March 2003

Evaluates community-based wildlife programs, and argues, "implementation strategy relies on pragmatic reasoning, where economic rationality constitutes the main criterion, it fails to take into account the various noneconomic values involved." Thus, it questions the broad applicability of any individual successful cases.

Vorlaufer, Karl. "Communal Conservancies in Namibia: Starting Point for Biodiversity Conservation and Poverty Alleviation?" *Erdkunde* 64 (1), 26–53, Jan.-March 2007.

(2) Examines "communal conservancies," programs in Namibia based on the idea of generating community income out of wildlife through trophy hunting and ecotourism. Argues that the costs of effective conservation are too high for such approaches to pay for both conservation and local income, and that effective conservation will require subsidies from government or outside groups.

Xu, Jianchu, and Melick, David R. "Rethinking the Effectiveness of Public Protected Areas in Southwestern China." *Conservation Biology* 21 (2), 318–328, April 2007.

(5) Argues that the "effectiveness of many protected areas in China is compromised by institutional conflicts, lack of ongoing financial and technical support, confusion between the objectives of generating revenue and conservation, dubious scientific definitions, lack of community trust in policies, and obscure user rights and land tenures." Thus, the authors contend that "China is better advised to support ongoing sustainable use of natural areas by the people who have lived and nurtured these environments for generations."

Walmsley, S.F., and White, A.T. "Influence of Social, Management and EnforcementFactors on the Long-term Ecological Effects of Marine Sanctuaries." *Environmental Conservation* 30 (4), 388–407, Dec. 2003.

Drawing on both biological surveys of fish populations and reef health, and interviews to determine community attitudes, this study notes that community support for the sanctuaries significantly linked to greater hard coral cover. Enforcement of regulations, meanwhile, proved most significant factor for protection of fish species. Also notes that effective preservation of fish within sanctuaries may have increased catches in adjacent, unprotected, waters.

Webber, A.D., Hill, C.M., and Reynolds, V. "Assessing the Failure of a Community Based Human-Wildlife Conflict Mitigation Project in Budongo Forest Reserve, Uganda." *Oryx* 41 (2), 177–184, April 2007.

(2) Evaluates a project of live trapping intended to prevent crop-raiding animals, finding the project largely a failure based on lack of "acceptance" at the local level. Identifies "operational failures" in: "(1) the identification of key stakeholders, (2) objective evaluation to assess the efficacy and benefit of the intervention, (3) participatory monitoring and evaluation, and (4) long-term funding commitment by conservation agencies."

West, Paige. *Conservation Is Our Government Now: The Politics of Ecology in Papua New Guinea.* Durham NC: Duke University Press, 2006.

(2) Presents an ethnographic examination of the history and social effects of conservation and development efforts in Papua New Guinea based on fieldwork between 1994 and 1999. Describes the disconnect between NGO workers and the Gimi people who live in the area. NGO workers attempted to encourage conservation and cultivate development by teaching Gimi to value biodiversity as an economic resource, while the villagers expected that in exchange for the land, labor, food, and friendship they offered the conservation workers, they would receive benefits, such as medicine and technology. In the end, the divergent nature of each group's expectations led to disappointment for both.

Westermann, O., Ashby, J., and Pretty, J. "Gender and Social Capital: The Importance of Gender Differences for the Maturity and Effectiveness of Natural Resource Management Groups." *World Development* 33 (11), 1783 1799, Nov. 2005.

Offers comparative analysis of "46 men's, mixed, and women's groups…in 33 rural programs in 20 countries of Latin America, Africa, and Asia." Finds that "collaboration, solidarity, and conflict resolution increase in groups where women are present" as do "norms of reciprocity" and "capacity for self-sustaining action," thus emphasizing the importance of attention to gender in collective management projects.

Wilson, N. "Community-Based Stream Conservation Initiatives in British Columbia, Canada." *Water Science and Technology* 45 (11), 171–175, 2002.

Presents three community-based conservation initiatives on rivers established by the Outdoor Recreation Council of British Columbia.

Wilson, R.K. "Collaboration in Context: Rural Change and Community Forestry in the Four Corners." *Society & Natural Resources* 19 (1), 53–70, Jan. 2006.

(2) Offers comparative analysis of four community-forestry projects in national forests in the southwestern U.S., and articulates a framework illustrating the way in which "place specific socioenvironmental contexts are reflected in the diverse form and structure of community-based forestry projects in the region."

Winter, S.J., Esler, K.J., and Kidd, M. "An Index to Measure the Conservation Attitudes of Landowners towards Overberg Coastal Renosterveld, a Critically Endangered Vegetation Type in the Cape Floral Kingdom, South Africa." *Biological Conservation* 126 (3), 383–394, Dec. 2005.

Develops a "user-friendly index to measure attitude of landowners towards conservation" through application of "iterative item reliability analysis" on data obtained from questionnaires of landowners. Argues that these scores will help to prioritize conservation efforts and resource direction.

Wood, J. "'How Green is My Valley?' Desktop Geographic Information Systems as a Community-Based Participatory Mapping Tool." *Area* 37 (2), 159–170, June 2005.

Compares effects of various types of maps and their effects, alongside other visual representations of landscape such as art, and argues that "hands-on use of GIS, with support, could benefit and empower community groups when responding to local geographic issues."

Woodroffe, Rosie, Frank, Laurence G., Lindsey, Peter A., Ranah, Symon M. K., and Romanach, Stephanie. "Livestock Husbandry as a Tool for Carnivore Conservation in Africa's Community Rangelands: a Case-Control Study." *Biodiversity and Conservation* 16 (4), 1245–1260, April 2007.

(2) "Our findings suggest that improvements to livestock husbandry can contribute to the conservation and recovery of large carnivores in community rangelands, although other measures such as prey conservation and control of domestic dog diseases are also likely to be necessary for some species."

Woodroffe, Rosie, Thirgood, Simon, and Rabinowitz, Alan. *People and Wildlife, Conflict or Co-existence?* Cambridge: Cambridge University Press, 2005.

Presents an overview of human–wildlife conflicts around the world and implications for conservation practice. Discusses community-based conservation, and ecotourism and trophy hunting conservation schemes as well, noting that despite great donor investment and support, these approaches have not for the most part been rigorously evaluated as to their effectiveness.

Zanetell, B.A., and Knuth, B.A. "Participation Rhetoric or Community-Based Management Reality? Influences on Willingness to Participate in a Venezuelan Freshwater Fishery." *World Development* 32 (5), 793–807, May 2004.

Presents results of a quantitative survey of three villages, finding that sense of community and dependence on fisheries were significant indicators of willingness to participate in community-based management. Perception of threats to fisheries actually negatively impacted willingness to participate, as this tended to lead to "defeatist" attitudes.